Chapter 3

DESIGNING PROGRAMS FOR QUALITY TEACHING AND LEARNING

After successful study of this chapter you will be able to:

- *Develop purpose statements and outcomes for programs.*
- *Systematically plan learning programs that are consistent with the NSW Quality Teaching model and the principles of outcomes-based education.*
- *Translate guidelines from syllabus and support documents into workable programs.*

We saw in Chapter 1 that the *Quality Teaching* model is one way of describing the pedagogical practices that encourage and support quality student learning. We also saw that there are many conditions that have to be in place before these pedagogical practices will be possible. Some of these conditions (such as the students' home environment) are beyond the control of teachers. However, most of the factors that were discussed in Chapter 1 can be influenced by teachers—some very directly and significantly, others to a lesser extent. Both the factors that teachers can control and those that they cannot control should be taken into account in the design of every learning program. Some of the ways in which you might do that are explored in this chapter.

BASIC PROGRAMMING IDEAS

The terms *program* and *programming* are used in several different ways, sometimes within the same educational system. There is general agreement that a *learning program* is a document that describes plans for a defined period of teaching and learning, and *programming* is the process of developing those plans. It is also generally agreed that programs should contain information about the outcomes students are expected to achieve, the teaching and learning strategies that will be used, the content students will explore, the ways in which students will be assessed, and the resources that will be needed to support the program. The common points of disagreement are the time period that should be covered by the program and the amount of detail that needs to be included—two factors that are closely related.

Why do teachers need to program? Because the process of programming helps teachers to clarify what they want students to learn and how they will facilitate learning:

and the product (the written program) provides guidance and simplifies teachers' day-to-day decision making. But why do individual teachers need to program—doesn't the syllabus provide sufficient guidance? The short answer is, no. The information and guidelines they are given in syllabuses, support materials and policy documents are usually too general to provide day-by-day guidance for teachers.

In any large system of school education in which curriculum development is centralised (as it is in each Australian State) the process of curriculum design produces guidelines that have to be applied in a great variety of different circumstances. The learners, teachers, schools, communities and resources across each State vary in ways that make it impossible and unwise to strive for complete uniformity. Therefore it does not make sense for the centrally produced guidelines to be too detailed or too rigid. As a consequence, a lot of the responsibility for deciding what, when and how to teach falls on schools and individual teachers. The process of making these decisions and documenting the resulting plans is usually referred to as programming. Each teaching program becomes an interpretation of the curriculum guidelines—both specific syllabus guidelines and broad guidelines derived from policies such as *Literacy Across the Curriculum*. This interpretation will reflect the way in which the principles embodied in the curriculum guidelines have been adapted to meet local needs.

The guidelines provided by the NSW Board of Studies suggest that teachers should develop programs for each Stage of each subject (such as Stage 4 English). Such programs would cover a two-year period for each Stage from 1 to 5, with Stage 6 typically being divided into the Preliminary and HSC programs. Programming for a whole Stage is useful in that it allows teachers to take a relatively long-term view and focus on the Stage outcomes—acknowledging that students will work towards these outcomes over a two-year period (except in Stage 6). However, to make such programs manageable, they need to be divided into shorter "units of work", typically five to ten weeks long. Each unit provides a building block that should be an integral part of the total Stage program. This approach to programming produces the following:

(a) A broad plan for the Stage that indicates how the total period of time will be divided into units of work. Minimal information (such as a unit title, outcomes and focus) is provided for each unit, and the sequence in which the units will be taught is specified. This part of the program is often referred to as a ***scope and sequence plan.***

(b) Detailed plans for each unit of work. The programming advice provided by the Board of Studies for each subject usually suggests that these unit plans should contain relevant information under at least the following headings: unit description; outcomes; integrated learning experiences, instruction and assessment; evidence of learning; feedback; and resources.

The information in the remainder of this chapter is broadly consistent with the guidelines provided by the NSW Board of Studies, but departs from that advice in several very important ways that will be highlighted. The major differences between my

advice and the advice from the Board of Studies occur because (a) the approach I take to outcomes-based education is more closely aligned to Spady's principles than is the approach taken by the Board (even though the Board does emphasise outcomes quite strongly), and (b) my advice is driven very strongly by the principles embedded in the NSW *Quality Teaching* model (which, at the time of publication of this book, had not been acknowledged by the Board of Studies even though it was being advocated by the Department of Education and Training).

For the remainder of this book, I will use the following conventions:

- If I am referring specifically to the programming approach of the Board of Studies, I will mention the Board and, in that context, the term "programming" can be taken to mean development of the scope and sequence plan and development of the plans for each unit of work.
- If I am referring to programming more generally, the term "programming" can be taken to mean the development of plans for a fixed period of instruction (such as a 10-week unit).

I will be suggesting that each program should have at least the following components:

- A rationale or purpose statement—to explain why the program exists at all and how it fits into a longer-term teaching and learning framework;
- Outcome statements—to indicate what students are to learn;
- Content statements—to indicate what concepts, themes and issues students will explore to develop the understanding and skills they need to help them achieve the outcomes;
- Teaching strategy statements—to indicate how the learning activities will be structured, organised and integrated;
- Assessment guidelines—to indicate when and how student learning will be assessed and reported.

To design programs that emphasise quality teaching and learning, you have to answer this question: How does the program need to be structured so that the desired learning outcomes can be achieved through the application of the pedagogical practices described by the *Quality Teaching* model? (Here I am using the term "program structure" fairly broadly to include selection of learning outcomes, selection of content and learning experiences, sequencing of content and learning experiences, and development and sequencing of assessment tasks.) The simple answer to this question is: The program designer must consider the principles of *Quality Teaching* when every programming decision is being made. A more complex answer will be developed as we progress through this chapter. You will be guided to make decisions (about the program purpose, outcomes, content, teaching and learning strategies, and assessment of student learning) that produce a program in which *Quality Teaching* is

not an "add-on" (just another box to be ticked off)—it will be central and integral to your program design.

There is no point in having a program document in which you simply list the elements of *Quality Teaching* that will be addressed. It should be taken as given that every element of *Quality Teaching* will be considered when designing every program, although not every element will be emphasised equally in the final program. Your challenge in documenting your program design is to describe clearly how, when and why each *Quality Teaching* element will be integrated into your program. This means you have to describe what teaching and assessment strategies you will use, and what learning strategies the students will use, to ensure that quality teaching and learning actually occur. For example, rather than indicate that "students will develop deep understanding", you have to indicate what level of understanding you consider to be "deep", how you will help students to achieve that level of understanding, and how you will know when they have achieved it. Therefore, your program might include statements such as "Students who have deep understanding of . . . will be able to . . ."; "Students will develop deep understanding by . . . "; "Students will demonstrate the depth of their understanding by . . .".

It should be obvious that the amount of detail I am suggesting here will produce a fairly substantial document for each program. I make no apology for this. The most important reason for developing detailed programs is that the process forces you to think about many issues that you might otherwise overlook. I see little point in writing a sketchy program to satisfy some administrative requirement. I see a lot of advantages in writing detailed programs that reflect the depth of thought you have given to each aspect of the program.

Some experienced teachers take considerable pride in being able to fit a 10-week program on one page. In defence of this approach to programming, they might argue that they do not need to program in the same amount of detail as novice teachers, or that brief information in the program is sufficient to remind them of all the things that they need to do. For some experienced teachers this may be true. However, when faced with the challenge of ensuring that they teach in ways that are consistent with the *Quality Teaching* model, all teachers (no matter how experienced) can benefit from the type of detailed programming that I am recommending in this chapter.

It is very easy to dismiss the *Quality Teaching* model and simply say "I do all that stuff so I don't need to write it in my programs". However, I have yet to meet a teacher who took the *Quality Teaching* model seriously and found that they really were "doing it all" and doing it so well that there was no room for improvement. On the contrary, it has been my experience that teachers who make the effort to document how they are trying to teach in ways that are consistent with the model always find that the act of producing a detailed program leads them to thinking about their teaching in new, beneficial ways.

Detailed programming has many advantages. Besides encouraging teachers to reflect on what and how they are teaching, the programs provide a useful record of what happens year by year. This makes future programming easier. Detailed programs also provide a useful focus for discussions with fellow teachers (at your school or other schools). Some teachers also find detailed programs a very useful resource for their students—a well-structured program can provide students with a clear picture of what they will be learning, why they will be learning it and how they will be learning it.

Before exploring these issues in detail, we will consider some of the broader issues that influence program design.

PROGRAMMING AS A FORM OF CURRICULUM DESIGN

Learning-program design is really curriculum design on a small scale. Therefore, to design sound learning programs, it is useful to know something about the broader principles of curriculum design. From your exploration of outcomes-based education in Chapter 2, you should be able to see that some of the big questions that curriculum developers (and program designers) must address are:

- What core values should underpin the curriculum?
- What things (understandings, skills, dispositions) are essential for *all* students to learn by the time they leave school?
- How can these important understandings, skills and dispositions be incorporated into the syllabus for a particular subject (or into a particular learning program)?
- What theories of learning should underpin our approaches to curriculum design?
- How will we know when students have learned what we want them to learn?

Of course, we will never get complete consensus on the answers to these questions—each of us has beliefs and past experiences that lead us to consider some types of knowledge, some levels of understanding, some skills and some dispositions to be more important than others. Even when we agree on what is important, we will not necessarily agree on how those important things should be dealt with at school. So every curriculum becomes an exercise in compromise—we try to balance the idealistic views of different stakeholders with the realities that constrain what can be achieved. These compromises are evident in any curriculum. One result is that it is extremely unlikely that all teachers of a particular subject (e.g., HSC[1] Physics) will

[1] The Higher School Certificate (HSC) is awarded to students who successfully complete secondary schooling (to Year 12) in New South Wales. The Board of Studies determines the curriculum for each HSC course.

agree with all the knowledge, skills and dispositions that are embedded in the Board of Studies syllabus for that subject. It is also unlikely that they will agree with all the learning activities, assessment tasks, and so on that are recommended in the syllabus. Nevertheless, teachers are required to "follow" the syllabus—to use the syllabus as a guide for developing learning programs and for assessing students. The remainder of this book explores how teachers can do these things in ways that are congruent with the principles of *Quality Teaching* and with the principles of outcomes-based education that were outlined in the previous two chapters.

For a detailed treatment of curriculum theory you should consult books such as Lovat and Smith (2003)—here we take just a brief glimpse to help us understand program design. Many early curriculum theorists (with the notable exception of Dewey) tended to fit into fairly distinct categories—humanists (e.g., Charles Elliot, William Harris), developmentalists (e.g., G. Stanley Hall, Charles McMurry), social reconstructionists (e.g., Charles Counts, Harold Rugg) and proponents of social efficiency (e.g., Ralph Tyler, John Bobbitt). However, later writers were more inclined to follow Dewey's example and blend ideas to develop new curriculum theories by adapting what they considered to be the best components of earlier theories. One result of this trend is that the essential elements of curriculum design (or learning-program design) have not changed much in the past fifty years, even though the surface features of the resulting curricula might appear quite different. Curriculum theorists (e.g., those mentioned above, plus Michael Apple, Benjamin Bloom, Jerome Bruner, Paulo Freire, Howard Gardner, Henry Giroux, Ivan Illich, Carl Rogers, Malcolm Skilbeck, B. F. Skinner, Ralph Tyler, Michael Young) have generally been concerned with one or more of the following issues:

- The purpose of education and schooling (this is often the defining difference in approaches to curriculum design);
- The structure of educational systems;
- The nature of curriculum and curriculum models;
- Needs analysis and the generation of goals, aims and objectives;
- Influences on curriculum content;
- The design of learning experiences;
- The structure and organisation of content and learning experiences;
- Assessment of student learning;
- Curriculum evaluation.

The philosophical orientations of each curriculum theorist, plus their understanding of sociology and psychology, influence the approaches they take to the above issues, and this produces great diversity in their theories. Likewise, differences in individual teachers' beliefs, perceptions, assumptions and knowledge about teaching, learning and the subject they teach have a strong impact on how they translate curriculum

theories into practice. However, at the risk of over-simplification, we can consider that attempts to translate various curriculum theories into practice usually result in one of the following three types of learning program: a *content-based* program, an *experience-based* program or an *outcomes-based* program.

Content-based programming is an approach that *starts* with the selection of content—with content being loosely defined as the knowledge and/or skills that students are to acquire. This approach to programming is usually based on the premise that there is a well-defined body of content that teachers should transmit to learners because this content has some inherent value. For example, it might be argued that the English curriculum should contain a study of Shakespearian plays because Shakespeare was one of the great English playwrights. Often, a content-based curriculum will rely very heavily on a subject-based textbook that is presumed to contain all the important content that students need. Programming then becomes a matter of deciding the scope (breadth and depth) and sequence of the content.

This approach to programming often puts a very strong emphasis on "covering the curriculum" by suggesting that teachers should teach a predetermined amount of content in each time period (lesson, term, year, and so on). This approach gives little consideration to how much *individual* students will learn in the available time. Given the differences that we know exist in students' ability, motivation, learning styles, and so on, variations in the amount that students will learn in a fixed time period are inevitable. Content-based programming can lead teachers to thinking that it is acceptable and appropriate for some students to learn more than others. In its extreme, this approach encourages teachers and students to view learning as little more than remembering and reproducing content—which usually leads to examination-based assessment practices and norm-referenced reporting of student achievement, both of which can encourage surface learning.

Experience-based programming is an approach that starts with the selection of activities in which students will engage, without necessarily considering what students might learn from these activities. For example, the starting point for the design of a unit in Biology might be to identify the "investigations" that the students will conduct. The rationale for the selection of learning experiences is often that they are "valuable" because that's the way the subject is always taught. Often, the assessment in these programs is based on the students' participation in the activities and their recording of "results", rather than on any in-depth analysis of what the students learned. Consequently, the teacher might not realise that students have achieved very different levels of understanding and skills as a result of their learning experiences.

Outcomes-based programming does not ignore the importance of content or learning experiences, but it *starts* with a clear specification of what students are to know, what they are to be able to do, and what attitudes or values they should be able to demonstrate at the end of the program. These desirable learning outcomes are then used to define the scope and structure of the content through which students will

develop the knowledge, skills and values defined by the outcomes. The outcomes are also used to focus the instructional methods so that each learning activity has a specific purpose. The outcomes determine how learning will be assessed (placing an emphasis on what learning students can demonstrate, rather than when they are required to demonstrate their learning); and they focus attention on the learning environment that will be necessary in order for the learners to achieve the outcomes.

It can be argued that these three approaches to curriculum design differ only in emphasis—all approaches have to take into account the content that students will encounter, their learning experiences and the results (outcomes) of their learning. However, the differences in emphasis are not simply incidental: they are the defining factor in these three general approaches to learning-program design—the approaches produce quite different types of programs. Consequently, students will learn different types of things from each type of program. At the risk of over-simplification, we can say that content-based programs teach students to value content for its own sake, experienced-based programs teach students to value experiences for their own sake, and outcomes-based programs teach students to value content and experiences as means to an end.

Traditionally, content-based programming and activities-based programming have been dominated by time. Time-dominated approaches usually require students to spend fixed periods of time studying certain subjects or engaging in certain activities regardless of how much there is to learn, what they know before they start, how difficult the content is to understand, how quickly they learn, or what they will know and be able to do when the "end" comes. In short, these approaches emphasise administrative convenience, with little concern being given to student learning. Most traditional approaches to education are bound by this tyranny of time. As Spady and Marshall (1991:72) suggest, much of the education in the Western world seems to be "mired in an Industrial Age model governed by an Agricultural Age calendar".

Why is it that in many schools the valuable learning time is divided into uniform periods that are jealously allocated to each subject area, and teachers continue to pretend that this is the best way to help students to learn? Some might be tempted to suggest that this is the only way that school can be organised, but is it? Time- and calendar-dominated programs would be quite sensible if all students learned at the same rate, developed at the same rate, mastered different subjects at the same rate, and were equally suited to an educational system that is structured for administrative convenience. Clearly, such assumptions are nonsense and make a mockery of claims that schools provide equitable learning opportunities for all students or that teachers are really concerned about their students' individual differences. Should teachers be satisfied with an education system that leads students to think that learning stops when the bell rings, rather than to think that the learning experience is over when they have achieved something meaningful? Should teachers be satisfied with a system that encourages students to see each subject as unrelated to any other subject, rather than to see each area of study as an integral part of their journey towards significant

learning outcomes that will prepare them in many different ways for their life beyond school? Should teachers be satisfied with providing students with endless activities that, for some students at least, have no clear purpose? Should teachers be satisfied that some lucky students manage to overcome the handicap of an outmoded system of education and succeed in spite of it? You can probably guess that my answer to all these questions is NO; but what are the alternatives? Well, the starting point is for all teachers to accept that they have a responsibility for helping to develop better curricula and a better education system. By "better" I mean a system (and curricula) in which all content and all student activities can be justified on the basis of how well they help students to learn meaningful things, in which all students are given equal opportunities to succeed, and in which every organisational and administrative decision gives top priority to student learning. This might sound idealistic and impossible, but why should it be?

Obviously, major time constraints cannot be ignored, but time can be seen as a flexible resource rather than as the principal factor that controls access to learning. The idea that time should be used as a flexible resource is one that will cause concern for many teachers, and rightly so. For now, we cannot simply ignore the fact that students come to school for a fixed number of days each year, or that teachers are paid to teach for a fixed number of hours each week, or that the Board of Studies specifies that students should study a particular subject for a fixed number of hours. However, curriculum, teaching, assessment and the organisation of schools should not ignore what we know about learning—and we know a lot more about learning now than the world knew when our current school systems and curriculum structures were designed. If we used what the world now knows about learning as the core of our approach to curriculum design, programming, teaching and school organisation it would *have* to produce more and better learning than a system that does not take these things into account. So how can we do this?

We can start by acknowledging that, in any given period of time (whether it be one hour or one year), not all students are capable of learning the same things, particularly if we teach them all in the same way. Therefore, we have to look for practical ways in which individual learners can be helped to make best use of their learning time, and practical ways in which teachers can make best use of their teaching time. However this is done, it will almost certainly mean that some students will have to be given multiple opportunities to learn and that teachers will have to use multiple ways of providing learning opportunities for students (Killen, 2003a). We can also try to learn from researchers such as Cambourne (1988, 1995) who argues that there are eight conditions necessary for effective learning—immersion, demonstration, engagement, expectation, responsibility, employment, approximation and response. Although Cambourne developed these principles from studies of how young children develop their literacy skills, there is strong evidence that the principles are consistent with what we know about how the human brain functions (Rushton, Eitelgeorge & Zichafoose, 2003). The principles are also generally consistent with the research-based ideas embedded in the *Quality Teaching* model and with the principles of

outcomes-based education. The remainder of this chapter will consider how principles such as these can be used to drive program design.

OUTCOMES-BASED PROGRAMMING

To be consistent with the philosophy that drives the outcomes-based school curricula in each State of Australia, teachers must take an outcomes-based approach to program design. *Programming for outcomes means organising teaching to achieve predetermined results for some specific purpose.* It starts with a clear specification of what students are to know, what they are to be able to do, and what attitudes or values it would be desirable for students to have by the end of the program. "In outcomes-based education . . . you develop the curriculum *from* the outcomes you want students to demonstrate, rather than writing objectives *for* the curriculum you already have" (Spady, 1988:6). With these outcomes as a guide, the program is constructed to give all students an equal opportunity to achieve each outcome. Of course, no approach to programming should ignore practical things such as the total amount of time available for teaching, or the resources that can reasonably be expected to be available, or the restrictions imposed by external bodies such as the NSW Board of Studies. However, these should be seen as broad constraints rather than as insurmountable barriers to good programming.

Outcomes-based programming encourages teachers to focus clearly and deliberately on student learning. From this perspective, program design becomes a problem-solving and decision-making exercise that can be guided by the following questions:

- What is the purpose of the program?
- What significant outcomes will learners need to achieve in order for this purpose to be realised?
- What situational factors (such as the learning context, the nature of the subject, the characteristics of the students) need to be taken into account?
- What content will learners need to master in order to achieve these outcomes and satisfy the purpose of the program?
- How should this content be structured and sequenced so that it will best support the learners' progress towards achieving these outcomes?
- What learning experiences will make it easy for learners to master this content?
- How should these learning experiences be structured and sequenced to best support the learners' progress towards achieving the outcomes?
- What will be the most appropriate way to assess learners' achievement of the outcomes?

- What formative assessment will provide the most useful information about learners' progress towards achieving the significant outcomes?
- How can we best judge the extent to which the program achieves its purpose?

There are many different ways of approaching outcomes-based programming and assessment (e.g., Brown, 1988; Burns, 1987; Burns & Squires, 1987; Fitzpatrick, 1991; Marzano, 1994; Nyland, 1991; Pollock, 1992; Smith, 1991; Spady, 1988) but they are all built around the idea that there should be a well-defined set of outcomes that *all* students are expected to achieve. The outcomes then determine what content students explore, what learning experiences are made available to them, how they are tested, how long they engage in learning particular knowledge or skills, and, above all, what is valued in the educational process. The traditional concern for instructional time is replaced with a concern for student learning. It is on this point that outcomes-based education is often criticised. Most frequently, the criticism will be that the outcomes must be trivial (or inappropriate) if all students are expected to achieve them (see, for example, McKernan, 1993.) This is a rather naive criticism because it is based on the assumption that it is never possible to have all students achieve appropriately complex outcomes. OBE supporters argue that it is always possible, but never easy, to specify appropriate outcomes and teach in ways that give all students a reasonable chance of achieving those outcomes. Rather than advocating trivial outcomes, they argue that all instructional efforts should be directed towards helping students to achieve *significant* learning outcomes. In practice, this means that programs have to be flexible so that students can engage in appropriate learning activities at the time that best suits their stage of understanding or mastery. It also means that assessment of student learning should focus on *how well* students understand rather than on *how many things* they understand. Finally, it means that students must be given multiple opportunities to learn and to demonstrate their achievement of the outcomes. We will now explore these ideas in a little more detail and relate them to the NSW *Quality Teaching* model.

You will recall from Chapter 2 that outcomes-based education is based on four principles known as clarity of focus, designing down, high expectations and expanded learning opportunities. To incorporate the principles of ***clarity of focus*** and ***designing down*** into the design of instructional programs that make up the components of a course it is necessary to have the following:

- A clear purpose for the program—derived from and linked explicitly to the overall purpose of the course;
- Clearly defined outcomes for the program—derived from and linked explicitly to the overall outcome of the course;
- Clear, explicit links between the program purpose and the program outcomes;
- Clear, explicit links between the program outcomes and each component of the program (learning activities, assessment tasks, etc.).

The most important point here is that teachers must know exactly what they want students to learn, and why, so that all instructional efforts can be directed towards helping students to achieve *significant* learning outcomes. The desired outcomes must drive decisions about content, learning experiences, assessment and so on. The main aim is that students learn important things, not that they learn them in a particular amount of time or in a particular way. It is, therefore, crucial to "get the outcomes right". When outcomes are "significant", it is important for students to achieve them and there are important consequences of students not achieving them. The importance of the outcomes is due to two principal factors: the value of the outcomes in their own right and their value as building blocks for further learning. From the *Quality Teaching* perspective, outcomes are important when they relate to the *deep knowledge* of the field of study and when their achievement depends upon students gaining a *deep understanding* of that knowledge.

An obvious extension of this focus on outcomes is that teachers have to anticipate difficulties that students might have in achieving the outcomes and to plan to minimise these difficulties. They also have to prepare students adequately so that they can succeed. One of the most common reasons that students are not successful is that they do not have the necessary prerequisite knowledge and skills at the start of the period of instruction (a point emphasised in the *background knowledge* element of the *Quality Teaching* model). You cannot simply ignore this and hope that somehow the students will "catch up". You must "design down" from the significant learning outcomes you want students to achieve and identify what knowledge and skills students need before they try to achieve the new outcomes. If necessary, these prerequisites have to be re-taught.

To incorporate the principle of high expectations into the design of instructional programs it is necessary to have:

- Clear statements of the standards to which learners are expected to achieve each of the outcomes;
- Guidelines that will help learners understand the difference between having a superficial understanding and a deep understanding of the concepts and principles they are studying;
- Learning materials that engage the learners in more than a superficial investigation of the ideas and principles they are studying;
- Assessment techniques that challenge learners and enable them to reveal their deep understanding.

This particular principle of outcomes-based education is the one most directly related to the *Quality Teaching* model—through the *high expectations, explicit quality criteria, deep understanding* and *engagement* elements.

To incorporate the principle of ***expanded opportunity*** into the design of learning programs it is necessary to have:

- Structured learning experiences that are designed specifically to help learners achieve the outcomes. These learning experiences must focus on the development of understanding and on the application of knowledge. It is not sufficient to focus only on the accumulation of knowledge.
- Variety in the methods of instruction. Not all students can learn equally well from any one particular teaching strategy. Don't select your teaching strategy before you have taken into account the outcomes you want students to achieve, the content you will use to help students achieve those outcomes, the characteristics of the students, and the resources that are available.
- Multiple examples and explanations of key points to assist learners who may find it difficult to interpret your initial explanation.
- Opportunities for students to practise using the new knowledge and skills that they gain, so that, under your guidance, they can explore and experiment with their new learning, correct errors and deepen their understanding.
- Multiple pathways through the learning materials to cater for those who either need more detail or are able to master the ideas more rapidly than others.
- A positive learning environment in which students know that they will be helped in their learning no matter how easy or difficult they might find it. This positive environment will depend on your relationship with the students and on your efforts to make the physical environment conducive to learning.

In short, this principle of outcomes-based education encourages teachers to make it easy for students to learn and not give up on those students who do not learn at their first opportunity. In *Quality Teaching* terms, expanded learning opportunities come through the pedagogical practices described by the *engagement*, *social support*, *substantive communication*, *student direction*, *knowledge integration*, *connectedness*, *inclusivity*, and *narrative* elements of the model.

In summary, an outcomes-based program will need to include the following:

1. A clear and concise statement of the purpose of the program (taking into account how that program fits into the total course of study that the learners will undertake);
2. A clear set of outcomes that describe what learners will be able to do when they have satisfactorily completed the program;
3. A detailed specification of the prerequisite knowledge and skills that students must have mastered before attempting to achieve each new outcome;
4. A set of structured learning experiences that will assist students to build on their existing knowledge and skills so that they can understand, master and integrate the new content;

5. Plans for guided practice sessions during which students can receive feedback on their progress towards the learning outcomes;
6. A set of assessment tasks that will provide reliable evidence from which valid inferences can be drawn about the extent to which individual students have achieved the intended outcomes.

One reason that outcomes-based education can lead to successful student learning is that it encourages teachers to be well prepared. Outcomes-based programming makes teaching purposeful and systematic, rather than haphazard, while still allowing students to discover, to follow their interests, to take responsibility for their own learning, and to develop both personally and academically. This requires teachers to provide students with *appropriate* and *purposeful* learning experiences so that they can develop originality, self-motivation and independence at the same time as they acquire useful knowledge and skills.. Teachers cannot provide students with appropriate opportunities to learn if they do not take the trouble to assess the students' prior knowledge, to identify possible difficulties, to select appropriate content and learning experiences, to reflect on the moral and ethical principles implicit in their teaching, and to consider the needs, interests and backgrounds of each student.

DETERMINING THE PURPOSE OF A PROGRAM

It is illogical to have an educational program that does not have a clearly defined purpose that influences all the decisions made about its design and implementation. This does not mean that every program has to have a narrow purpose or a vocational purpose—but it does have to have a purpose. In other words, it should be possible to say, in simple terms that can be understood by learners, "The purpose of this program is to . . ." or "This program exists so that . . ." The task of developing such a statement is never a trivial one.

Before we try to decide what the purpose of a particular program might be, it is useful to consider some broader issues such as the question of why we have formal educational programs at all. One answer to that question is that the process of formal education at school, university or elsewhere can be thought of as a systematic attempt to transform learners in some quantifiable way—to take learners who have certain characteristics when they enter the course/program and change them into the learners we want them to be by the end of the course/program. For convenience, I will use the terms "entry characteristics" and "exit characteristics" respectively to describe what the learners know (their knowledge and understanding), what they can do (their skills or competencies), and what they are like (their attitudes, values and beliefs) when they enter the course/program and by the time they satisfactorily complete it.

The more clearly we can define the changes we want to bring about in our learners, the more clearly we can describe the purpose of the program we are designing. The

more clearly we can define the purpose of the program, the more rationally we can design a program to help learners achieve the desired exit characteristics. Using this approach, the process of program design becomes one of answering the question: *How can we develop a program that will enable the learners who enter it to become the type of learners that we want to exit from the program?* Program design then becomes a decision-making process that should be guided by:

1. What we would like the program to achieve (i.e., the ways in which we want the program to transform the learners);
2. How we think we might be able to achieve this transformation (based on educational theories and our own past experience);
3. The practical constraints that will influence and limit what can be achieved.

In a general sense, the purpose of any educational program is to enable learners to achieve some desirable "exit characteristics". Therefore, the first questions to answer when designing a program are:

- Who should decide what learner exit characteristics are desirable?
- What factors need to be considered when deciding these exit characteristics?
- What is the most useful way to describe the exit characteristics?

The simple answer to the first question is that the desirable exit characteristics should be decided by those who are best qualified to do so—people who are expert in the field. Of course, this raises the question: Who are the appropriate experts? If the program we are designing has a clear long-term vocational focus (such as an engineering degree program) then the experts might be representatives of the profession that the graduates will enter and academic experts in the field. In this case, the desirable exit characteristics will be determined primarily by the occupational roles and tasks typically undertaken by graduates. When the program does not have a clear vocational focus (such as most programs in schools) the situation is much less clear. For example, if an English Literature program is being designed, should the "experts" be academics who have studied English literature or people who produce it (e.g., playwrights), or someone else? In the NSW school system, the major "exit characteristics" of students are decided by the Board of Studies at two crucial points (the School Certificate and the Higher School Certificate) so, by default, the "experts" are the members of the individual course panels. To understand how you can translate the information provided in the syllabus and support documents into a useful purpose statement for a short-term or medium-term program you first need to consider some broader issues.

Traditionally, there are six major factors that should influence the purpose of a program (i.e., influence the desirable exit characteristics of the learners). These factors will not be equally important for all programs, but the general ways in which they need to be considered are summarised below.

The learners: It is not sufficient to simply focus on the exit characteristics of learners and say that the purpose of the program is to help learners achieve those outcomes. When learners enter an educational program, they come with certain knowledge and understanding, skills, attitudes and values, beliefs, expectations, biases, social status, learning preferences and so on. Program designers should not ignore these things because they will all influence the learners' chances of success in the program. The program designer must consider how each of the learners' characteristics might influence their success in the program, make accurate assessments of those characteristics and design the program to maximise the learners' chances of success. This may not be a simple process, but it is a realistic approach to designing programs that will have high success rates. Programs that are designed without due consideration of the characteristics of the learners are unlikely to be successful.

Professional/community expectations: This is probably the most significant influence on the general purpose of all education programs, particularly in post-school education. If the program has a clear vocational focus, the expectations of the profession that the graduates will enter will be crucial in defining the purpose. For example, medical practitioners expect that new graduates from medical schools have certain knowledge, diagnostic skills, and so on. In most cases, these expectations can be summarised as "The new graduate will be able to work as a beginning-level professional, taking an appropriate level of responsibility, dealing with appropriately complex issues, and producing work of an appropriately high standard". The expectations of the profession in which the graduates will work are often expressed through professional Codes of Practice or through licensing or registration requirements. Of course, there will be different expectations of what are "appropriate" standards in different professions. For example, most medical graduates enter an internship of at least one year during which they receive close guidance from more experienced doctors and during which they are not permitted to perform major operations. There is a clear expectation by the medical profession that new interns will not have all the knowledge and skills that they need to be a fully qualified doctor, and this should influence the design of undergraduate medical programs. For example, these programs should deliberately prepare graduates for "learning on the job" during their internship. By contrast, beginning teachers generally work alone and from their first day of teaching have essentially the same responsibilities as experienced teachers. Consequently, teacher education programs should prepare graduates to work autonomously and to deal with all the challenges of teaching from their first day of employment.

The general community also has expectations of new graduates and experienced professionals. There is a general community expectation, for example, that any new graduate who is providing a specialist service (accountant, lawyer, and so on) will be competent to do the job. This issue is explored quite thoroughly by Eraut (1998) who examines the notion of what it is to be a competent professional. There are also general community expectations about the purpose of programs that

do not have a specific occupational focus (e.g., a Bachelor of Arts degree). These expectations might vary considerably from one community to another, but they usually include notions of the graduate being well educated, literate and articulate.

It has never been easy for curriculum designers to take account of *all* the factors that influence the desirable characteristics of graduates. Consider, for example, the difficulty of trying to ensure that a curriculum takes adequate account of the professional expectation that doctors should uphold the Hippocratic oath, or the community expectations that teachers should arrive at school on time and not physically mistreat their pupils. It cannot be assumed that graduates will have automatically achieved these outcomes simply because they have "passed" all subjects in a content-based program. These desired results must be addressed specifically and directly. If program designers in post-school education settings ignore the expectations that the profession and community have for the graduates they are trying to produce, the perceived value of the program will soon diminish and there will be little reason for students to enrol in it. But what about learning programs in schools?

It is generally agreed that school programs are not simply a means of preparing young people for work. Therefore, community expectations about what students will learn at school are not linked to any specific occupation or group of occupations. It is generally expected that school will prepare some, but not all, students for further study (e.g., at TAFE or university) but this does not necessarily mean that school curricula should be designed specifically for that purpose. There are those who argue that school should prepare all students for work (either immediately after they leave school or after further education or training). This view had a strong influence on the development of the Key Competencies in Australia (Mayer, 1993). But does this mean that every school program should contribute to students' readiness for work?

Others (e.g., Spady, 1994b) argue that school should prepare students for the various "life roles" that they will fulfil after school regardless of what those life roles might be. But who should decide what those life roles are?

The broader one's view of the purpose of school the more difficult it is to design curricula and learning programs that will assist students to achieve that purpose. Some of the problems that this "lack of direction" causes for curriculum designers (and teachers) will be explored later in this book. For now, you need to consider questions such as: In what ways do broad community expectations influence those who make policies about school education? How are general community expectations reflected in the curriculum for the subjects I teach, and what difference will this make to what and how I teach? How do schools become aware of the expectations of their local communities and to what extent should these expectations influence school curricula in general and my learning programs in particular?

Tradition: Many of the subjects taught in schools (e.g., Mathematics) have existed in some form for a long time. In many cases, these subjects have long traditions that influence both the content of the subjects and the ways in which they are taught. Obviously, there are sound reasons for such traditions. However, it is easy for teachers to fall into the trap of allowing such traditions to dominate their program design and teaching. Throughout this book, you will be encouraged to apply a healthy scepticism to such traditions and question their relevance to the needs of today's students.

Future trends, conditions and challenges: As well as considering what has happened in the past, curriculum designers must consider what is likely to happen in the future. Programs should be designed to prepare learners for the future (which inevitably will be different from the world experienced by any past generation of students). At a simple level, this means equipping learners with the knowledge, skills and dispositions they will need in their future life roles. At a more complex level, it means preparing learners to be flexible and adaptive, so that they can cope with situations that, as yet, cannot be imagined.

Institutional policies: When teachers are designing school programs, they cannot ignore the constraints imposed by the institutions within which they work. Teachers must consider school policies. Many schools claim to be distinctive in some way: either because of the type of programs they provide (e.g., technology-based programs), or the way they provide them (e.g., grouping students by Stage rather than by Year), or the general philosophy on which the school operates (e.g., that senior students should be considered as young adults rather than old children). Often, the characteristics that officially define (and distinguish) a school are expressed formally in mission statements. If curriculum designers do not take such statements into account when thinking about the purpose of the programs they design, there is little chance that the intent of these statements will be realised.

Systemic constraints: Program designers cannot ignore the systemic constraints within which they must operate in order to develop acceptable programs. For example, in NSW, teachers must design their programs within the broad policy guidelines provided by the Board of Studies and by the Department of Education and Training. In many situations (such as the design of Stage 6 programs that are preparing students for the HSC) the systemic constraints will dominate—teachers will assume that the curriculum designers have "done their homework" and produced a high-quality syllabus that takes account of the broad influences described above. Teachers will then develop programs from the information in the syllabus. In this situation, the important questions to answer are: Why is this program part of the overall course of study in this subject? What are the connections between this program and the overall course of study?

When curriculum designers attempt to consider all the above factors and clarify the purpose of a program, they face a complex and ill-defined task. It is complicated by

the fact that as the program designers consider these factors, their beliefs and professional judgements act as filters. Two people attempting to design the same program will interpret the external influences differently and place different importance on each of them. Therefore, whatever purpose is defined for a program, it will be questionable.

Any attempt to design a program to achieve a set purpose will also be questionable—different curriculum designers will have different ideas about how it should be done. However, this is not a reason for despair. Any attempt at program design should be seen as temporary—the program should be continually evolving as better ways of describing and implementing it are developed. For this evolution to occur, program designers need to be more than just experts in their field (e.g., Art); they must also have expertise in curriculum development and evaluation.

DETERMINING PROGRAM OUTCOMES

In school systems such as that in NSW, teachers have to deal with three levels of outcomes: the syllabus outcomes that define what students should achieve in each Stage (two-year period), program or unit outcomes that define what students should achieve in relatively short periods (say, 10 weeks), and lesson outcomes that define what students should achieve in individual periods of instruction. Program designers must make sure that these three levels of outcomes are aligned—the lesson outcomes must help students to achieve the unit outcomes and the unit outcomes must help students to achieve the syllabus outcomes. This alignment is achieved through the application of Spady's principle of "designing back"—the unit outcomes must be derived from the syllabus outcomes, and the lesson outcomes must be derived from the unit outcomes. So, how can you do this?

The first step is to make sure that you understand the syllabus outcomes sufficiently well to be able to explain them in terms that students will understand. This should sound like common sense, but you cannot always count on the syllabus writers providing you with clear and unambiguous outcomes that are written in language that students will understand. Consider the following examples of outcomes from the Stage 4, 5 and 6 English syllabi in New South Wales:

> *Stage 4*: A student responds to and composes texts for understanding, interpretation, critical analysis and pleasure.
>
> *Stage 5*: A student responds to and composes increasingly sophisticated and sustained texts for understanding, interpretation, critical analysis and pleasure.
>
> *Preliminary Stage 6*: A student demonstrates understanding of the relationships between composer, responder, text and context.
>
> *HSC Stage 6*: A student demonstrates understanding of how relationships between composer, responder, text and context shape meaning.

These outcomes are all related to the same aspect of English but they represent increasingly complex achievements. For such outcomes to guide student learning at any particular stage, students must know exactly what the relevant outcome means (e.g., what exactly is a sophisticated text and how is one text ore sophisticated than another). It will also help if, from the beginning of Stage 4, they know what all the outcomes mean and understand how each outcome describes different levels of learning. For example, Stage 5 students need to understand how the Stage 5 outcome will take them beyond their Stage 4 learning and how achievement of it will provide a foundation for their Stage 6 learning. You may not want to spend much time discussing Stage 6 outcomes with Stage 4 students, but the developmental nature of these outcomes should influence your approach to teaching.

Of course, we should not be considering any Stage outcome in isolation from the other outcomes that students are required to achieve in that subject in that Stage. You have to ensure that students achieve all the Stage outcomes, and there are several different ways of doing this. Here is a point on which my advice differs from that provided by the NSW Board of Studies. I will use the Stage 4 English syllabus as an example—you can download it from the Board of Studies web site. The Stage 4 English syllabus has eleven outcomes, namely:

A student:

1. responds to and composes texts for understanding, interpretation, critical analysis and pleasure;
2. uses a range of processes for responding to and composing text;
3. responds to and composes texts in different technologies;
4. uses and describes language forms and features, and structures of texts appropriate to different purposes, audiences and contexts;
5. makes informed language choices to shape meaning with accuracy, clarity and coherence;
6. draws on experience, information and ideas to imaginatively and interpretively respond to and compose texts;
7. thinks critically and interpretively about information, ideas and arguments to respond to and compose texts;
8. makes connections between and among texts;
9. demonstrates understanding that texts express views of their broadening world and their relationships within it;
10. identifies, considers and appreciates cultural expression in texts;
11. uses, reflects on and assesses individual and collaborative skills for learning. (Board of Studies NSW, 2003b:13)

By way of example, the Board suggests that these eleven outcomes could be addressed through 16 five-week units of work, such as the following:

Unit 1: Myself – introduction to high school
Types of texts used: fiction, film, picture books, media
Outcomes: **1**, 2, 3, 4, **6**, **9**, 11

Unit 2: Investigating poetic techniques and creating a poetry anthology
Types of texts used: poetry
Outcomes: 1, 2, 4, **6**, **8**, 9, 10, 11
(Board of Studies NSW, 2003c:12)

From seven to nine outcomes are listed for each unit, with the main outcomes being shown in bold. Outcomes 1, 4 and 11 are listed for every unit and each of the other outcomes is listed for at least 8 of the 16 units. This approach suggests that some of the outcomes are important all of the time and most are important most of the time. It does not indicate a systematic attempt to apply the principles of outcomes-based education—the units are essentially content-based with some outcomes sprinkled on the top. So, how could it be done differently?

The basic difference I am suggesting is that we could follow Spady's principle of "designing down". That would mean looking at the total package of eleven outcomes and developing an integrated set of units of work that would progressively and deliberately take learners towards achieving those outcomes to high standards. Each unit would have its own set of outcomes (probably no more than three if we stick with the idea of five-week units) that were derived from the eleven syllabus outcomes but which were not simply repetitions of those outcomes.

To derive outcomes for each unit, we could look at the eleven syllabus outcomes and see that they collectively focus on three things: responding to texts (both privately and publicly), composing texts, and developing better learning skills. We could then ask questions such as: What knowledge, understanding and skills do students need to respond to texts in appropriate ways? How can we help students to acquire the knowledge, develop the understanding and practise the skills? What levels of understanding do we want students to achieve (what is the difference between deep understanding and shallow understanding)? What levels of skill do we want students to achieve (what is the difference between high levels of skill and low levels of skill in relation to responding to and composing texts)? Can the understanding and skill be achieved by studying different types of text in isolation (film, poetry, etc.) or would it be better to focus units on cross-media themes? Is it better to develop a range of low level understandings and skills first and then take students to higher levels, or is it better to develop a narrow range of understandings and skills to a high level and then broaden the range? The answers to questions such as these should provide a clear purpose for each unit. From this purpose statement, and the original eleven outcomes, it will then be possible to derive a distinctive set of outcomes for each unit. This would produce a very different set of units. We might, for example, have a unit on *expressing ideas imaginatively*. This unit could have outcomes such as: "Students will identify the imaginative ways in which authors, poets and playwrights create desired

effects in their texts" and "Students will use imaginative techniques to compose short stories and multimedia messages".

If you take this approach, each learning unit will have outcomes that are much more specific than the syllabus outcomes. The unit outcomes will describe learning that can be demonstrated by the end of the unit, whereas syllabus outcomes describe learning that students must be able to demonstrate by the end of a Stage.

It is very important that unit outcomes are written in terms that students will understand, otherwise the outcomes will not help students to focus on whatever it is that they are supposed to be learning. It is often useful to give students examples of what they will be able to do when they have achieved each outcome at a "satisfactory" standard. In Chapters 5 and 6, this idea will be expanded as we explore the importance of helping students to understand the difference between achieving an outcome to a low standard and to a high standard.

DETERMINING PROGRAM CONTENT

> *The greatest enemy of understanding is coverage. As long as you are determined to cover everything, you actually ensure that most students are not going to understand. (Howard Gardner)*

The majority of syllabus documents that the NSW Board of Studies has produced in recent years outline content in terms of things that students will "learn about" and things that they will "learn to". For example, in Science 7-10, students learn **about** "significant developments that have contributed to the progress of science throughout history" and learn **to** "participate individually or as part of a team in an investigation of how a technological development has changed the way we live". The Board refers to some content as "essential"—for example, the Science 7-10 syllabus indicates that it is essential for students to learn about "the history of Science" and it is essential for students to learn to "use models to describe different forms of energy". You will notice, however, that even the "essential" content is described in quite general terms, so teachers still have to choose the specific content for each unit of work. Your selection of specific content has to be guided by questions such as: "What types of content do students need to master in order to achieve the program outcomes?" and "What specific content will be most relevant to students?"

Program design is not simply a process of deciding what content should be "covered" and in what sequence learners will be exposed to that content. "Superficial coverage of all topics in a subject area must be replaced with in-depth coverage of fewer topics that allows key concepts in that discipline to be understood" (Donovan, Bransford & Pellegrino, 1999:16). Clark and Linn (2003) illustrate very clearly that "packing the curriculum with many . . . topics results in superficial understanding for many students" and that deep understanding "requires sustained study of carefully designed

materials". The major task in content selection is to decide what really important ideas you want your students to understand and be able to use as a result of participating in the learning program. You cannot decide this unless you are clear about why these ideas are important. (When you think something is important, it is a good idea to step back and ask yourself whether it will really matter to students in ten years time—if the answer is no, then it is probably not really important now.)

When selecting content for a learning program, some teachers feel bound to "cover" every topic in the syllabus. The pressure to do this can be particularly strong when the syllabus is linked to high-stakes external assessment (such as the Higher School Certificate in NSW). In these circumstances, the syllabus must be used as a guide, but the guidelines provided in the syllabus should be interpreted in light of what really is important in the subject. This point was made strongly in a very interesting study of a group of teachers whose students consistently achieved in the top 1% of HSC results. Ayers, Sawyer and Dinham (2004:156-157) found that while "the HSC provided the focus for their teaching", approximately one-third of the teachers "reported that the examination was not unduly restrictive because they taught for understanding rather than the examination". Even teachers who considered that their approaches to teaching were dominated by the HSC still highlighted the importance of having students apply knowledge and, therefore, they emphasised "interpretation, rather than simple reproduction, of knowledge". It seems that one of the keys to success for these teachers was an approach to teaching that emphasised depth of understanding more than breadth of content coverage. So, how can you do that?

First, you have to accept that, whatever information is given in the syllabus under the heading of "content", it is only a guide. It will generally provide either a broad indication, or specific examples, of the type of content that students should study. You have to decide what specific content you will use to help students acquire the knowledge and skills they will need to achieve the syllabus outcomes. You also have to decide how to structure, organise and sequence that content so that it will be easy for students to learn. One convenient way of describing what students need to understand is to express that knowledge as sets of concepts, themes and issues.

Concepts are abstract ideas that provide mental frameworks for making sense of an area of study. They are single words or phrases that convey broad ideas. For example, *management, leadership, profit, business entity, customer, consumer behaviour* and *strategic planning* are all concepts from the field of Business Studies. It should be immediately obvious that some concepts are much more complex than others (for example, *customer* is a simpler concept to understand than *strategic planning*). It should also be clear that some concepts will be much more important than others in helping students to understand a field of study. The concepts that are essential are sometimes referred to as the *key concepts* of that field. In the language of the *Quality Teaching* model, the key concepts and their relationships define the *deep knowledge* of the subject.

Themes are ideas that run as threads throughout a program. For example, a unit on marketing might use as a theme the idea that *the primary objective of business is to maximise profit in the long term;* and an introductory unit on business management might have as one of its themes the idea that *strategic planning is necessary to ensure the long-term viability of an organisation.* One of the benefits of basing content around *themes* is that the themes provide unifying ideas that help students integrate their knowledge (relate the key concepts to one another) and this helps learners to link what they are learning to the overall purpose of their study. Integration is an important step in helping students to develop deep understanding.

Issues are the primary problems that students need to understand in order to achieve the program outcomes. For example, in an introductory unit on business management, learners would need to understand that two of the major issues (problems) that managers have to deal with are *diversity in the workforce* and *the finite nature of resources.* One of the benefits of basing content around *issues* is that the issues help students to see the relevance of the things they are learning in real (or realistic) situations—and this is one of the important elements of *Quality Teaching.*

In addition to understanding concepts, themes and issues, students need to master skills in order to demonstrate outcomes. ***Skills*** are abilities or routines that are developed through practice. For example, *creating a marketing plan, leading a group discussion* and *organising a training session* could all be considered as skills that are important for business managers. Skills obviously require foundational knowledge, but understanding concepts is not sufficient to produce skilled performance. For example, knowledge of how to conduct a business meeting does not guarantee that a manager can conduct the meeting skilfully. There are many different types of skills, for example, communication skills, interpersonal skills, reflexive skills and various technical skills. However, most skills can be learned through observation/instruction, practice, feedback and more practice. Ensuring that students have opportunities for these learning activities is an important part of designing learning programs.

When the content of a program is described in terms of the skills to be mastered and the concepts, themes and issues that learners need to understand to achieve the program outcomes, it will be easier for learners to see how all the content is relevant (an important element of *Quality Teaching*). It will also be easier for teachers to focus each unit of study on the ideas that really are most important, and thus avoid overloading students with unnecessary content.

Clark (2003:10) makes the useful suggestion that "programs should be deliberately designed to engage students with difficult concepts and concepts that are frequently misunderstood". He illustrates this point using the concept of thermal equilibrium (the idea that the temperature of objects in the same local environment will equalise if there is sufficient time for heat to be transferred from one object to another). This concept is often difficult for students to understand because their personal experiences may seem to contradict the principle. In students' experiences, some

materials usually feel hotter or colder than other materials (e.g., if a metal spoon and a wooden bowl are both left in a refrigerator for several hours, the spoon will feel colder than the bowl even though they are the same temperature). To help students understand why this happens, they first have to understand that some materials (e.g., metal and glass) tend to feel hotter or colder because they conduct heat energy better than other materials (e.g., wood). When you touch a metal object, heat energy flows more quickly into or out of your hand than when you touch a wooden object. In Clark's research, students often interpreted this experience using the misconception that "if it feels different it must be a different temperature". Students can be "so committed to this interpretation of their experience that they are extremely resistant" to alternative (and scientifically correct) explanations. Part of the challenge of program design is to identify the things that will be difficult for students to learn and provide them with information and experiences that will help them make sense of these difficult concepts.

A word of caution: the value of concepts, themes and issues as a means of defining program content will diminish if there are too many of them. As a rough guide, it would be useful to identify around six key concepts for a 10-week program—these will be over-arching concepts that subsume many other important concepts. For example, a concept such as *strategic management* would subsume concepts such as *long-term planning* and *integrating functional areas of management.* A second level of key concepts can be used to focus each section of the program. In general, it will usually be sufficient to use two or three major themes and two or three major issues to focus a 10-week program.

Whether or not you select and organise content around concepts, themes and issues, you need to remember that content selection is always somewhat arbitrary. Different teachers can make different content choices and still have their students achieve the same outcomes. You also need to keep in mind that much of the content you choose to use will be based on problematic knowledge that should be probed and questioned. Finally, you need to remember that none of the content you use should be treated in isolation—all content should be seen by students as part of some integrated whole.

CURRICULUM INTEGRATION

In Chapter 1, you were introduced to the idea that knowledge integration was an important element of the *Quality Teaching* framework. In that chapter, *knowledge integration* was described as the process of building meaningful connections between pieces of knowledge gained from different sources, both within and across subjects. To help students integrate knowledge, teachers have to structure learning programs and instruction in ways that make it easy for students to make deliberate meaningful connections between ideas that may, at first, appear to be unrelated. The goal is to help students develop an integrated understanding of all the elements of each subject

they study and an integrated understanding of all those subjects. With this level of understanding, students will be able to recognise patterns and relationships both within and across content areas, thus helping them to organise their knowledge into a meaningful "whole".

Knowledge integration is also an important aspect of outcomes-based education. If, as suggested in Chapter 2, outcomes are to be "high quality, culminating demonstrations of significant learning in context" (Spady, 1994a:18) then each thing that students learn must contribute to their holistic understanding of the field of study. Students must understand the relationships between important concepts within each subject and across subject boundaries. This result will not be achieved for most students unless curricula are deliberately designed to enhance integration and to emphasise its importance. There are many ways of approaching this challenge and several of them are outlined in the remainder of this chapter.

Within-subject knowledge integration

With reference to Science education, Clark and Linn (2003) describe knowledge integration as "the process of adding new ideas and sorting through connections to develop a cohesive account of scientific phenomena" and this serves as a useful general description of knowledge integration. They also suggest that developing "deep understanding of science requires sustained study of carefully designed materials" and that simply "packing the curriculum with many science topics results in superficial understanding for many students". The same could be said for any subject.

The starting point for within-subject integration is to identify the key ideas that will be used as the focus for integration. The interconnections between these key ideas should provide the starting point for structuring the program. In *Quality Teaching* terms, these key ideas must be part of the deep knowledge of the subject—the things that must be understood in order to make sense of what is being learned. Once the key ideas and their relationships have been identified, teachers then have to plan a program that will achieve the following:

(a) Provide students with sufficient time and learning opportunities to understand these important ideas;

(b) Deliberately expose students to information, problems and assessment tasks that will help them to explore the ways in which the key ideas are related to one another.

Across-subject knowledge integration

If students develop a well-integrated understanding of each subject they study in isolation from other subjects then the education system has failed them. The more each subject is isolated from other subjects, the less meaning it has for students. For example, students who study Mathematics and Music (as all students do in NSW

schools) but never see the connections between them will have a limited understanding of both Mathematics and Music. An ideal school education would help students to understand that subjects, Key Learning Areas and academic disciplines are all artificial (and in some cases very arbitrary) divisions of knowledge. Real understanding comes when students can bypass these artificial barriers.

In the real world, there are no absolute barriers between fields of study—every field of study is related to some other fields of study. When students start to understand these relationships they are able to use knowledge gained from one field of study to help them understand issues and problems in other fields. In turn, this helps them to develop greater depth of understanding in both fields.

Most school students cannot be expected to integrate knowledge across subject boundaries without considerable guidance, particularly if they are not accustomed to exploring these relationships. Therefore, teachers have to plan programs that will lead to students making meaningful connections between knowledge gained from different KLAs. This will not be achieved if teachers simply make superficial references to the ways in which different areas of knowledge are related. All connections must be made deliberately as part of an overall strategy for helping students to integrate their knowledge.

Knowledge integration across subject boundaries is often easier for Primary school teachers than for Secondary school teachers, simply because most Primary teachers are responsible for teaching across all KLAs and most Secondary teachers have a much narrower focus in their teaching. At the level of rigour expected in most Secondary subjects (particularly for the HSC examination) it is unrealistic to expect teachers to be "expert" in more than one KLA (or even in all subjects within some KLAs). However, this is not an excuse for a teacher in any KLA to be totally ignorant of what students are supposed to be learning in other KLAs. All teachers should be constantly looking for opportunities to expand their own knowledge and this should include learning about subjects that they do not teach so that they can help students make meaningful connections across subject boundaries.

Focusing on long-term generalised outcomes

Helping students to integrate knowledge across subject boundaries while still teaching within those boundaries is the first step towards knowledge integration. To achieve higher levels of integration (the ideal type of integration that is emphasised in the *Quality Teaching* model) it is necessary to design learning programs around outcomes that are not subject-specific (rather than designing programs within the strict boundaries of isolated subjects such as Mathematics, History or Physics). In such an integrated approach, knowledge, skills and ways of thinking from various traditional subjects are combined to help learners achieve quite broad outcomes such as those described by the Key Competencies (Mayer, 1993) or those embedded in the New Basics (Queensland's recent approach to curriculum reform). This can be achieved in

two ways. The first approach retains the notion that Key Learning Areas have value and should be preserved—so the program uses outcomes from several KLAs but is designed and taught within one KLA. This form of integration could be achieved in the following ways:

- Working within one subject or KLA, develop a purpose statement for a program that will help students to achieve several important outcomes in that subject.
- Consider ways in which knowledge and skills traditionally related to other subjects or KLAs might help students to achieve this purpose.
- Select specific outcomes from each subject/KLA that are directly related to the purpose of the program.
- From these outcomes, derive an integrated set of program outcomes.
- Select content and design learning experiences that will engage students in a coherent study that will enable them to achieve the program outcomes.
- Develop assessment tasks that are aligned with the program outcomes.

An alternative approach is to ignore all existing subjects or Learning Areas and design a program directly from long-term significant outcomes that are not unique to any KLA. This approach works best when the integrated programs are designed by groups of teachers from various KLAs and when the program is being designed to address some school-wide issue or problem. Programs to achieve this form of integration could be designed as follows:

- Identify an important issue or problem (that is clearly not confined to any one KLA) that students should be able to deal with. For example, students need to be able to make informed, rational decisions as consumers.
- Identify a group of teachers who have the expertise to design a program to address this issue.
- Develop a purpose statement for the program.
- Develop a set of specific outcome statements that describe what learners should understand and be able to do on successful completion of the program.
- Select content and design learning experiences that will engage students in a coherent study that will enable them to achieve the program outcomes.
- Develop assessment tasks that are aligned with the program outcomes.

In the second approach, some teachers might be concerned that traditional subjects are being devalued, or even eliminated from the curriculum. This is a legitimate concern, particularly for those teachers who have devoted their careers to specialising in a narrow subject area. However, it is perhaps more important to have an education system in which each subject is valued for the contribution that it can make to

students' achievement of long-term, significant outcomes (such as the Key Competencies), rather than for its intrinsic value. This might be hard for some teachers to accept, but the following points might help you to understand the logic behind this approach.

If we agree that long-term goals (such as the Key Competencies) are important, then we must consider how to make best use of the limited resources (including time) that are available to help learners achieve these outcomes. It seems that such long-term outcomes are best achieved by having learners develop knowledge, skills and dispositions through a system that puts learning in context and integrates different fields of study so that all learning is pertinent and relevant. It can be argued, for example, that a Key Competency such as "*collect, analyse, organise and critically evaluate information (in real life situations)*" is most likely to be achieved if it is approached from a multidisciplinary perspective. It is clearly an outcome that would be difficult to achieve if it were approached through just a single subject such as History or Physics. Some might argue that it could be approached through a number of *separate* subjects, each dealing with the collection, analysis, organisation and evaluation of information from the perspective of that particular subject. This might be effective, but it relies on the students being able to make connections between the subject-specific skills that they are developing and the overall real-world application of this knowledge and skill. It may be easier for students to develop and use the knowledge and skills if the content and teaching processes emphasise the integration by removing some of the artificial barriers between subjects.

Of course, the approaches to integration being suggested here require teachers to take new approaches to their teaching and new responsibilities for the overall learning outcomes of their students. Teachers of Mathematics, for example, can no longer see themselves as being responsible for teaching Mathematics in isolation, or teaching it simply because Mathematics has some inherent value. They must now see themselves as teaching Mathematics because it will help students to achieve much broader outcomes and they must teach it in a way that will help students to see how Mathematics relates to the other subjects. Often, this approach will require teachers to teach in ways that are very different from their own experiences as students.

In summary, programs that emphasise cross-subject knowledge integration will have the following characteristics:

- The programs will be based on themes and issues of substance and significance—they will be intended to help students achieve deep understanding of deep knowledge.
- The program will have significant outcomes—outcomes that matter in the long run.
- The learning activities will emphasise connections and help students see the purpose of their learning—connections will not be left to chance.

- The learning processes will be active, will involve the investigation of important and often controversial ideas, and will be motivating for both students and teachers.
- Learning will occur within contexts that are real and significant to the students.
- Learning will be a continual process of deliberately building upon students' prior knowledge.
- Learning will result from sustained investigations rather than isolated, unrelated encounters.
- Students will be required to demonstrate their learning through substantial assessment tasks.

It is easy to see how such integrated programs suit the types of pedagogical practices emphasised in the *Quality Teaching* model described in Chapter 1.

PLANNING LEARNING EXPERIENCES

"A child's school day should make sense. It should be about something. Ideally, the various activities of the day should work together, building upon one another for some purpose" (Simpson, 1990, cited in Pigdon & Woolley, 1995:4). The knowledge integration described in the previous section will help students to make sense of what they are learning, but it will not occur by accident—you have to make it happen through the learning experiences you create for students. This is a particular challenge for Secondary school teachers.

From the discussion of *Quality Teaching* in Chapter 1 and OBE in Chapter 2, it should be clear that quality teaching does NOT start with the choice of a teaching strategy. That choice comes after many other important decisions have been made. Before we can make the choice, we have to ask the following questions that are developed from the outcomes that we want students to achieve:

- What important ***knowledge*** do I want learners to gain from this program, unit or lesson?
- What ***understanding*** do I want learners to gain from this program, unit or lesson?
- What do I want learners to be ***able to do*** with this knowledge and understanding? (In what ways do I want learners to be able to apply their knowledge and understanding?)
- What ***skills*** will learners need to gain from this program, unit or lesson in order to be able to apply their knowledge and understanding?

- What ***attitudes, values or dispositions*** will learners need to develop in order to apply their knowledge, understanding and skills in appropriate ways?
- What learning ***experiences*** will be most likely to help students to learn these things?

In answering these questions, it is important to consider that knowledge is constructed rather than discovered, and that teaching/learning should focus on student understanding rather than memorisation. Teaching is no longer defined as the transmission of knowledge; instead, it is defined as the process of helping students to understand information and to transform it into their own personal knowledge. Teachers become facilitators of learning instead of transmitters of knowledge, and this is how it should be because no matter what you do as a teacher, you cannot claim to be teaching unless learners are learning. Understanding happens when students think about and try to make sense of the world, but you cannot expect most students to do this without some help. However, you need to be careful that your "helping" does not become too prescriptive or students will think that they must accept your understanding of everything, rather than developing their own understanding.

Before you can decide how best to help students learn, you have to consider questions such as:

- How do people come to develop the knowledge, skills, values and attitudes that I am trying to teach?
- Which teaching strategies are best suited to the type of learning (knowledge, skills or attitudes/values) that I want to occur in this lesson?
- Do the students have the necessary knowledge, skills and attitudes to use the strategies that I am considering?
- How can I take advantage of students' prior knowledge?
- How much time, space and other resources do I have, and how will they restrict my choice of teaching strategy?
- How do my own knowledge, skills and attitudes (about teaching and about the subject) influence my teaching practice?
- How can I make it easy for students to learn?
- What motivational strategies can I use to foster self-confidence in my students?
- How will I know that I am teaching as well as I possibly can?

You will soon see that the goal of having *all* students succeed in achieving a set of meaningful learning outcomes requires teachers to be innovative and creative. If teachers want all students to learn well and to achieve significant outcomes, they must strive for these results by giving students certain types of learning experiences. The implications for programming and teaching can be summarised as follows:

- *Teachers must prepare their students adequately so that they can succeed.* This requires teachers to understand exactly what they want students to learn, to anticipate difficulties that students might have and plan to minimise these difficulties. One of the most common reasons that students are not successful is that they do not have the necessary prerequisite knowledge and skills at the start of the period of instruction. You cannot simply ignore this and hope that somehow the students will "catch up". You must identify what knowledge and skills students need before they try to achieve the new outcomes you have set and, if necessary, review essential prerequisites at the start of each unit of work. You might also have to provide additional time or assistance to some students.
- *Teachers must create a positive learning environment* in which students know that they will be helped in their learning no matter how easy or difficult they might find the learning process. To a large extent, this positive environment will depend on there being a supportive relationship between you and your students, but it will also depend on your efforts to make the physical environment conducive to learning. You can also help to create a positive learning environment by always having explicit criteria for what constitutes high-quality student performance. (Refer to Chapter 1.)
- *Teachers must help their students to understand what they have to learn, why they should learn it (including what use it will be to them in the future), and how they will know when they have learned it.* Do not assume that students will see the relevance of what you are teaching just because you know why you are doing it. And never teach anything for which you can see no useful purpose. (Refer to the significance dimension of the *Quality Teaching* model.)
- *Teachers should organise learning and instruction around important ideas* (such as the primary concepts, generalisations and underlying themes of the content) rather than focusing on isolated facts.
- *Teachers should acknowledge the importance of prior knowledge* because it provides learners with a cognitive structure that they can use to make sense of new learning.
- *Teachers should use a variety of methods of instruction* in order to help students learn. You should not assume that all students can learn equally well from any one teaching strategy. You need to select the most appropriate strategy after you have taken into account the outcomes you want students to achieve, the content you will use to help students achieve these outcomes, the characteristics of the students, and the resources that are available. You should not assume that the so-called "student-centred" strategies are always the best strategies to use in OBE. Often they will be appropriate, but sometimes more direct methods of instruction are appropriate (see Killen, 2003a, for examples).
- *Teachers should challenge students* by presenting them with problems that have ambiguity, complexity, uncertainty and multiple solutions so that they will be stimulated to develop deep understanding

- *Teachers should view learning as a joint cognitive venture* between learner, peers and teacher.
- *Teachers must provide students with sufficient opportunities to practise* using the new knowledge and skills that they gain, so that under the teacher's guidance they can explore and experiment with their new learning, correct errors and adjust their thinking. It is essential for students to learn how to apply their new knowledge and skills rather than just accumulate new knowledge and skills. Of course, application of knowledge and skills is also an essential component of authentic assessment (which is explored in later chapters).
- *Teachers should integrate assessment with learning* so that students receive immediate feedback and so that they are able to see the connection between their learning and the testing of that learning.
- *Teachers must help each student to bring each learning episode (lesson or group of lessons) to a personal closure* so that they are aware of what they learned and where it is leading them. Do not assume that students can do this without your guidance.

If teachers want to be successful with their outcomes-based programming, they need to look at it from their students' perspective. Consider for a moment the questions that students might ask about any particular learning episode (beyond the obvious "Is it in the exam?"). Some basic questions might be: What do I have to learn? Why do I have to learn it? What will I be doing while I am learning? Will it be interesting and useful? How will I know that I am learning what I should be learning? Will I have any say in what I learn? How will I be assessed? If teachers can answer these questions for their students they will be well on the way towards developing an effective outcomes-based approach to programming and teaching.

At first reading, the above ideas might suggest that outcomes-based programming is a linear operation that progresses in a lock-step fashion from outcomes to content to teaching strategies to assessment. Nothing could be further from the truth. Outcomes-based programming is an iterative process in which considerations of content, teaching methods and assessment are integrated around a common concern for what students need to learn if the purpose of the program is to be realised. At each step of the process, curriculum designers must reflect on the ways in which the elements of the curriculum influence one another.

BUILDING ASSESSMENT INTO A PROGRAM

The recent syllabuses produced by the NSW Board of Studies advocate "assessment for learning not just assessment for accountability" (Board of Studies NSW, 2003c:6). This is consistent with the views of researchers such as Brown (2003) who suggests that a major function of assessment is to provide information for improving student

learning and instruction (an idea that is developed further in later chapters). For assessment to enhance learning, it must be an integral part of teaching and learning, not an add-on. This requires careful planning so that relevant formative assessment occurs at appropriate times throughout the program.

The information about assessment for learning included in recent syllabus documents for Years 7-10 in NSW is based on a set of six principles (see, for example, Board of Studies NSW, 2003d:71). These principles (shown in italics in the following paragraphs) have the following implications for programming:

Assessment for learning emphasises the interactions between learning and manageable assessment strategies that promote learning. When this principle is applied, programs will indicate explicitly how assessment tasks have been planned to provide students with opportunities to demonstrate specific outcomes (see Chapter 7 for specific guidelines); assessment tasks will be embedded in learning activities, not simply tacked on to the end of them; and teachers will use the results of assessment to reflect on what students have achieved and to modify their teaching programs to improve student learning.

Assessment for learning clearly expresses for the student and teacher the goals of the learning activity. This can occur only when students understand the purpose of the assessment task and the criteria by which their demonstrations of learning will be judged. This information should be included in the program or support materials, as well as being included in each assessment task.

Assessment for learning reflects a view of learning in which assessment helps students learn better, rather than just achieve a better mark. When this principle is applied, programs will focus on important things and include assessment tasks that encourage deep learning. The program will also encourage students to take academic risks and motivate them to strive for deep understanding.

Assessment for learning provides ways for students to use feedback from assessment (to improve their learning). For this to occur, feedback must be individualised and related to each student's achievement relative to standards; it should not be norm-referenced feedback. The feedback should be clear and constructive, and be directed towards students' strengths as well as their weaknesses.

Assessment for learning helps students take responsibility for their own learning, but only when the standards are clear, the feedback is individualised, and when there are opportunities for self-assessment that will help students identify how they can improve their learning. All of these issues must be addressed explicitly in programs.

Assessment for learning is inclusive of all learners. For this to occur, assessment must be made against well-defined standards that are free of bias, and made under conditions that permit students to achieve at their best.

In summary, *assessment for learning*:

- is an essential and integrated part of teaching and learning;
- reflects a belief that all students can improve;
- involves setting learning goals with students;
- helps students know and recognise the standards they are aiming for;
- involves students in self-assessment and peer assessment;
- provides feedback that helps students understand the next steps in learning and plan how to achieve them;
- involves teachers, students and parents in reflecting on assessment data. (Board of Studies NSW, 2003d:780).

****

Review and reflect on your learning

1. What are some of the possible ways in which the elements of *Quality Teaching* could be made explicit in a learning program?
2. Imagine that you have been asked to evaluate a learning program. What criteria would you use? Would you use different criteria if the program was for a Primary class or a Secondary class? Why?
3. What factors are likely to have the greatest influence on how learners respond to your learning programs?
4. What factors will determine the success you have in helping learners to achieve the outcomes of the programs you design?
5. Clark (2000:334) cautions against program design that results in "rote non-extensible understandings" and calls for programs that produce "understandings generative and rich enough to allow students to make connections to other concepts, warrant assertions, and explain perspectives in essay questions". Develop an argument to support Clark's point of view. Is this point of view consistent with the *Quality Teaching* model?
6. Lovat and Smith (2003:57) assert that "good curriculum will always be the result of reflection, both on the insights of educational research and on one's own classroom practice". What does this imply about the need for teachers to continually update their knowledge? Is the view being expressed by Lovat and Smith consistent with the NSW *Quality Teaching* framework as it was presented in the 2003 Discussion Paper?
7. Bennett et al. (2004) emphasise the importance of prior knowledge in helping students to construct new understandings. Review their report and compare their recommendations with the pedagogical practices suggested in the *Quality Teaching* model.

8. How could you structure a learning program so that students investigate controversial issues as a means of improving their understanding of the role of debate in advancing knowledge in your specialist teaching area?

9. What might be some of the advantages and disadvantages of a Head Teacher preparing a learning program and then requiring other teachers to follow it?

10. What might be some of the advantages and disadvantages of a Principal requiring all teachers in a school to use a common format or framework for their programs?

11. Obtain a copy of a learning program from a teacher in your specialisation. Critically evaluate the program from the perspective of the ideas presented in this chapter.

12. What specific programming guidelines are provided for teachers in the State in which you will teach? Are those guidelines consistent with the advice provided in this chapter?