Research and the Five Dimensions of Effective Schools:
A Self-Assessment Guide for the Chinese Educator

Edited by
Yong Zhao, David Lustick, and Wenzhong (Eric) Yang

US-China Center for Research on Educational Excellence
Michigan State University
Research and the Five Dimensions of Effective Schools

Copyright 2005 by
US-China Center for Research on Educational Excellence
and Michigan State University
East Lansing, Michigan
Research and the Five Dimensions of Effective Schools:
A Self-Assessment Guide for the Chinese Educator

Table of Contents

Introduction........................................................................................................3
    David Lustick and Yong Zhao

Teachers and Teaching: A Research Synthesis.............................................7
    David Lustick and Han Xue

Curriculum: What accounts for good curricula?—A Basic Framework.........24
    BaoHui Zhang, David Lustick, and Shih-pei Chang

Learners and Learning: A Research Synthesis...........................................38
    Steven Wojcikiewicz, Heng Jiang, and Wenzhong (Eric) Yang

Leaders and Leading: An Introductory Framework .................................61
    David Lustick and Jing Lei

Family and Community: The Home-School Collaboration.......................80
    Wenzhong (Eric) Yang and My Thi Lien
Research and the Five Dimensions of Effective Schools

Research Synthesis: Learners and Learning

Steven Wojcikiewicz, Heng Jiang, and Wenzhong (Eric) Yang
Michigan State University

Introduction:

This review is designed to familiarize educators and policymakers with the great variety that exists among accounts of how “learning” happens. We begin by introducing the familiar model of classroom teaching and learning known as the “traditional model” and then laying out some of its assumptions. Next, we use these assumptions as starting points for showing how theories of and ideas about learning in classrooms can go far beyond this common conception. In other words, we will take one specific and common idea of how learning happens in the classroom and use it to show how much else is out there. These other ideas will be formulated around five “General Statements on Learning,” which will first be described in brief and then again in greater depth.

The Five General Statements on Learning:

**Statement 1:** Learning is an active process, and it changes both the learner and that which is learned.

**Statement 2:** Learning, being an active process, requires that the student play a role, and thus the student’s motivation is important.

**Statement 3:** Learning is different for each learner, both in the way they learn and in what they bring to the learning process.

**Statement 4:** Learning takes place within social and cultural contexts which are central to the learning process.

**Statement 5:** Learning is a connected, conceptual process, dependent on multiple ways of knowing.

Conclusion:

The traditional model of classroom learning was adopted as a starting-off point so that those who were familiar with it could see the many, many other possibilities that have been put forth. The General Statements portray learning as an active process where motivation is important, uniformity cannot be assumed, social and cultural contexts are relevant if not central, and the questions of transfer and quality of experience must be confronted. Even these observations about learning do not cover all the possibilities, but they are a beginning, and they do touch on some vital issues. The educator or policymaker who would study learning so as to try something new is clearly confronted with a massive task. We hope that the tools supplied here will, in some measure, help them to tackle it.
Part I: Introduction

Educators and policymakers who are working to develop new schools and innovative curricula have a great many questions for which they need answers. Some of these questions will certainly be about learning: what it is, how it works, and how it can be made to work well. The problem that these inquisitive individuals will face, as they carry out their investigation into the nature of learning, is that there are no definitive answers. This lack of specificity is not a problem to be cured, nor an obstacle that can be overcome through painstaking research. It is, rather, the nature of the subject, of the field, that learning cannot be defined in one way for all people in all situations. Thus, the first thing that our educators and policymakers will find out through their investigation is that a certain open-mindedness is necessary. They must possess a willingness to consider, and to make use of, a variety of methods and theories.

This review is designed, in this spirit of open-mindedness, to give these searchers a start in familiarizing themselves with the wide variety of learning theories that are being discussed today. The point of this work is not to provide one description of “how learning works.” Instead, the authors hope to show that there are multiple conceptions of learning and its workings, and to briefly describe some of them. We wish to give curious educators and policymakers a box of “tools,” tools which they might then pick out, examine, ponder, and, perhaps, put to use. This box of tools will be presented in the form of several general statements on learning, with each statement being supported and elaborated upon. The reader is invited to have a look at these tools, to try them out, and, hopefully, to read further in the referenced works about ideas that seize their attention. The ideas presented here should not be taken either as exhaustive or final: there is more to know about the ideas described here, and there are more ideas too. As mentioned before, this toolbox is meant merely to be a helpful start.

Our plan for presenting this box of tools starts with a model of classroom teaching and learning known as the “traditional model.” This model will be the foundation on which our review is built. Examining briefly the features of this model, we will lay out a few of the assumptions about learning that are contained in it. Then we will use these assumptions as a starting point for showing the many ways that learning in classrooms can go beyond this common conception. In other words, we will take one specific and common idea of how learning happens in the classroom and use it to show how many other ideas are out there. These other ideas will be formulated into four “General Principles,” which will be first be described in brief and then again in greater depth. We will conclude with a short discussion on application of these principles or, in other words, on using the tools.
Having said all that, it is time to begin. First off, we must address our basis, and so we now turn to a quick examination of the “traditional” model of education and what it assumes about learning.

Part II: The Traditional Model of Classroom Learning

There is, in the field of education, a sort of generalized model of how learning takes place in schools. This model (which we will refer to as the “traditional” model) will sound familiar to many educators in America and abroad. The model has other names: teacher-centered, didactic, transmission, and expository, among others. While there are variations between these and other descriptions, the general sense of the traditional model can be summed up in a few key statements.

In the traditional model, the classroom is built around the idea that the teacher knows what is to be taught and the student is there to receive knowledge and skills from the teacher. The primary methods of the traditional classroom are lecture, recitation, drill, work from textbooks, and testing for knowledge of facts and procedures. Learning, in this model, is reception of given knowledge and skills: the student is a receptacle, an empty vessel into which the teacher pours the water that is the subject. The students as a group do not interact much, working individually at desks, maintaining a disciplined and sometimes a competitive atmosphere. Their interests and ideas are seen as secondary to the agenda of the teacher, who controls what is learned and how. The students’ role is to complete their assigned work and to regularly demonstrate the determined competencies.

This traditional model, as it has been implemented, carries with it several important assumptions about learning. A list of them includes the following:

1. Learning is passive, and involves the reception of knowledge as given
2. Learning is dependent on the teacher as actor, and the student merely follows
3. Learning is uniform among individuals in a class
4. Learning takes place primarily as a communication between teacher and learner, with knowledge flowing into the individual
5. Learning automatically transfers to other subjects, and so can be taught didactically and measured via standardized, fact- and procedure-based tests

As mentioned above, the traditional model is central to educational debate, both to those who favor it and those who would do away with it. Just as the field of education relies on the traditional model as a baseline, so will this review. Once more in the spirit of the idea that there is no one “right answer” to the questions of how learning works, the traditional model is not presented here as a “wrong answer.” Rather, it is presented as a framework from which to discuss the many possible answers to the question of how learning works in the classroom. These five particular assumptions of the traditional model are given as conversation starters, and will be the foundations for the five General Statements on Learning that this paper puts forth.

Part III: The Five General Statements on Learning
In order to come up with our five General Statements on learning, using the traditional model as our jumping-off point, we will now take the five assumptions of the traditional model, listed above, and re-phrase them. Instead of being limiting statements, describing one way that learning works, these re-phrased assumptions will now act as expanding statements, showing how learning comes in many forms. For example, the traditional model assumption that “learning is passive, and involves the reception of knowledge as given,” is re-phrased as “learning is an active process, and it changes both the learner and that which is learned.” When all the given assumptions of the traditional model are transformed in this way, we arrive at our general statements. Without further delay, here they are:

**Statement 1:** Learning is an active process, and it changes both the learner and that which is learned---This statement, derived from the traditional assumption that learning is a passive process, goes against the notion of the “student-as-container,” where knowledge is placed into the student’s head like boxes are stacked in a closet. The central piece here is that students construct their knowledge, and thus their own part in the process is vital.

**Statement 2:** Learning, being an active process, requires that the student play a role, and thus the student’s motivation is important---This statement answers the idea that the teacher is the prime force in initiating and controlling learning. When students are seen as active participants in their learning, their motivation to participate must be taken into account. The “why” of learning can affect the quality, usefulness, and meaning of that which is learned.

**Statement 3:** Learning is different for each learner, both in the way they learn and in what they bring to the learning process---This statement expands the traditional assumption that learning is a uniform process. Prior knowledge and experience, developmental levels, and different ways of encountering the world all contribute to the varied dynamics of learning for the individual students in any given classroom or in a school.

**Statement 4:** Learning takes place within social and cultural contexts which are central to the learning process---This statement challenges the assumption that learning is a simple interaction between teacher and student. Social and cultural contexts play into learning in a variety of ways, from questioning the very definition of learning to putting forth new ways of thinking about interactions between teachers and students, students and one another, curricula and the class, and so on.

**Statement 5:** Learning is a connected, conceptual process, dependent on multiple ways of knowing---In our traditional assumption, learning is seen as a general process: any knowledge or skills that are learned in a particular way in school, and tested in a
particular way, are assumed to be accessible for, and applicable to, other situations. This view is challenged when definitions of learning include reference to experience and to transfer. Not only is learning thus seen as a much more involved and complex process than simply transmission, but ways of teaching and assessment are problematized, as is the very mission of education. Now that we have arrived at our framework and have named the tools in our toolbox, it is time to examine them individually.

**Part IV: The Five General Statements on Learning Expanded**

The purpose of this section is to expand upon the General Statements that we have arrived at above. At this stage, we have taken note of the traditional model of classroom learning, used some of its assumptions to construct statements about the broader definitions of and issues in learning, and have briefly described each of our statements. Our next task is to explore each of the statements in greater depth, making note of references that further develop, or expand greatly upon, each of our points. And so we revisit the Five General Statements on Learning, one at a time and in some detail.

**Statement 1: Learning is an active process, and it changes both the learner and that which is learned.**

The idea that learning is an active process means that the students, rather than simply receiving knowledge as-given, are playing a part in their learning. The three key ideas here are 1) that the student is changing, 2) that the knowledge is changing, and 3) that the changes are taking place based on what the student brings to the transaction. This account of learning has found a great deal of acceptance in the field of education. The National Research Council’s ambitiously titled *How People Learn: Brain, Mind Experience and School* (Bransford et. al., eds., 1999) claims that “in the most general sense, the contemporary view of learning is that people construct new knowledge and understandings based on what they already know and believe” (p. 10). The National Council of Teachers of Mathematics and the American Association for the Advancement of Science, in their standards and curriculum projects, both endorse similar views (NCTM, 2000; Rutherford and Ahlgren, 1991). Learning as an active process also lies at the base of other broad institutional efforts and publications, such as the National Research Council’s National Science Education Standards (NRC, 1996), and resources provided by the Northcentral Regional Educational Laboratory (NCREL, 2004) and the Northwest Regional Educational Laboratory (Jarratt, 1997; Stepanek, 2000).

Beyond this general level of agreement, however, there are a great number of variations on the theme of learning as an active process. This diversity stands as both an invitation to further reading in the field and as a challenge to anyone who wishes to make a quick study of it. A good place to start is with the idea of “constructivism.” In the realm of educational research, constructivism is the most widely used way of talking about the student as active participant in their learning. As its most basic, constructivism is the
belief that students construct their knowledge, that the curriculum is transformed by its contact with the student. There are many strains of constructivist ideas and it should not be surprising that researchers do not always agree with one another as to what ‘constructivism’ means. However, there is general adherence to the idea that in constructivist approaches to learning, students are not passive knowledge receivers.

One place to start in a quick glimpse of constructivism is with Jean Piaget, one of the recognized pioneers of constructivist thinking. Piaget’s research was concerned with development, and he laid out a picture of the child assembling cognitive structures by the processes of assimilation and accommodation. Assimilation involves the interpretation of events in terms of existing cognitive structures whereas accommodation refers to changing the cognitive structure to make sense of the environment. The three key ideas mentioned above, those of student change, knowledge change, and the role of prior knowledge and experience, can all be seen in Piaget’s theories (see Piaget, 1929, 1969, 1970; Piaget & Inhelder, 1969). Educators have adapted Piaget’s work by seeing in these processes the picture of the active learner, making modifications to knowledge and to self, and Piaget’s ideas have been incorporated into teaching practice, curriculum design, and educational standards (Bybee & Sund, 1982; Wadsworth, 1978).

Other researchers whose names are associated with the foundations of constructivism, such as Lev Vygotsky, Jerome Bruner, and John Dewey, offer different variations on the theme of the student’s active part in learning. Change in the student, change in the knowledge, and the importance of prior knowledge are present, but are emphasized and portrayed in multiple ways. Vygotsky (1978) also has the learner building knowledge, but unlike Piaget, Vygotsky includes a much greater role for the social aspect of learning. Specifically, Vygotsky has learning taking place as a process of gradual adoption of social interactions as internal functions (also Cole, 1985). The learner works with others, accomplishing tasks with help, then gradually internalizes the role of the others until the task can be completed alone. Bruner’s (1960) version is concerned more directly with school, and he is concerned with how students can take the ideas of school subjects and make them their own, understanding them deeply and using them in the world. In his more recent work, Bruner has expanded his theoretical framework to encompass the social and cultural aspects of learning as well (Bruner, 1986, 1990, 1996). As for John Dewey, his name is often associated with active learning because, in some of his work, he supports classroom activities associated with real life, social and practical activity outside the classroom (Menand, 2001). Still, Dewey’s active learning is based, not merely on activity, but on the notion of embedding learning activities within useful pursuits, so that the guiding discipline of the classroom comes, not from an external source, but from the activity itself. Further, the Deweyian notion of “an experience” can be seen as a model of learning, where an individual is taken out of harmony with their environment, changed through a process of “doing and undergoing,” and then returned, now “seeing” things differently (see Dewey, 1902, 1980, 1997).

There is much more in the study of constructivist ideas of learning and researchers have adopted and developed constructivist thinking far beyond these well-known names.
Von Glassersfeld, for example, has come up with an idea called “radical constructivism,” which states not only that learning is a matter of knowledge construction, but also that the order that humans see in the world is constructed in this way (von Glassersfeld, 1995; Reigler, 2003). This is an extension of Piaget’s general bent, which is toward cognitive structures that are located inside the heads of individuals, but the work of others has gone in different directions. Some researchers have adapted and extended Vygotsky’s work into a realm known as “socio-cultural” research where learning takes place as a social phenomenon, rooted in environment, social interaction, physical arrangements and artifacts, and cultural contexts (Lave and Wenger, 1991; Rogoff and Lave, 1984; Rogoff, 1990) In this line of work, practices like apprenticeship, individuals learning as participants in a group, and individuals learning supported by cultural and physical artifacts are emphasized. Another variation on the role of the social aspect in individual knowledge construction comes from Cobb (Cobb et. al., 1993), where students are learning as individuals and as a group, negotiating knowledge as a class and then constructing meanings for themselves in a reciprocal and reinforcing process. Even with all this variation, these examples are by no means exhaustive, and the reader who is interested in student construction of knowledge is encouraged to look further. Two good examples of pieces which confront and lay out some of the many definitional differences of constructivism and related studies are Cobb and Bowers (1999) and Prawat (1996).

When all is added up, the many different takes on the active nature of learning and on constructivism, do not definitively describe just how learning works, but they do show a lot more is going on in classrooms than a mere transfer of knowledge. Again, the idea of learning as an active process has focused educators on the importance of seeing the student as changing, the knowledge as changing, and the student’s prior knowledge as vital.

**Statement 2: Learning, being an active process, requires that the student play a role, and thus the student’s motivation is important.**

When the student is no longer passive, other questions arise, and learning is suddenly, to some extent, the responsibility of the learner. If the student must act to learn, they must have some reason to do so, and the possibility arises that they simply will not. A more nuanced view of this student role in learning might draw the distinction, not between “learning” and “not learning,” but rather between types of learning, and it is here that motivational research comes into play. Students’ reasons for doing what they do can affect the quality of what they learn, how they will be able and willing to use their skills and knowledge, and what their learning, or learning in general, mean to them.

Both Bruner and Dewey, mentioned above, are concerned with the student’s desire to learn. Bruner (1960), wants depth in learning of subjects and transfer from school to the rest of life, and recognizes that student engagement is how to get to these goals. Dewey (1902, 1997) places emotional engagement at the center of his concept of an experience, both in the pain of change and in the pulling-along through that pain that is a part of the
fulfilling nature of growth. Each of these researchers recognize that there are different sorts of motivation, some which are central to and reinforcing of the activity, known generally as intrinsic and some which come from outside of the activity and of the student, known as extrinsic. Both come down on the side of motivation rooted in the subject, the experience, and in what learning can do for the student.

Carl Rogers is another influential thinker who has thrown in his two bits regarding student motivation, and who emphasizes the intrinsic. Rogers (Rogers and Frieberg, 1994) places great emphasis on the interests of the individual, claiming that significant learning takes place when the subject matter is relevant to the personal interests of the learners and when learners exercise control over the process of learning. The qualities of significant learning, which Rogers calls “experiential,” are personal involvement, self-initiation, evaluation by the learner, and a pervasive effect on the learner. While Combs (1982) further examines the significance of Roger's work to education, Rogers is not a central figure in the study of motivation. Neither, technically, are Dewey and Bruner. Motivation is its own concentration, and so we turn to a glimpse of this area of research.

The ideas of intrinsic and extrinsic motivation, from within and from without, are used in the field of motivation, but their treatment is much more extensive and complex than this simple dichotomy. Stipek (2002) places an emphasis on intrinsic motivation, and on structuring the classroom environment to allow it to work, while pointing out the positive effects of intrinsic motivation and the negative effects of extrinsic. Deci and Ryan (1987) also emphasize intrinsic motivation as a positive outcome, though they stress that the intrinsic/extrinsic split is not powerful enough and instead frame their ideas in terms of self-regulation, and arguing supporting students’ autonomy in learning is preferable to simply controlling them. Students’ own actions in determining how their learning takes place are similarly the focus of the work of Schunk (2001) and Zimmerman (2001) on Self-Regulated Learning (SRL). William Glasser (1990) also focuses on individual needs, contending that behavior is never caused by a response to an outside stimulus. Instead, his control theory states that behavior is inspired by what a person wants most at any given time: survival, love, power, freedom, or any other basic human need. Lepper (1988) suggests that intrinsically motivated students tend to employ strategies that demand more effort and that enable them to process information more deeply. They also tend to prefer tasks that are moderately challenging, whereas extrinsically oriented students gravitate toward tasks that are low in degree of difficulty. Others who have emphasized the role of student autonomy, self-awareness, and responsibility in learning include Holec (1981), Usuki (2002), and Little (1995, 1996).

Students’ views on control are also emphasized in the contrast between what are known as entity and incremental approaches to learning, with an incremental approach assuming that practice, effort, and persistence will increase their chances of future success (Burhans & Dweck, 1995; Dweck & Leggett, 1988). The contrast between incremental and entity approaches followed work on mastery-oriented vs. helpless children and then led into an analysis of the differences when students focused on the task at hand vs. when they focused their performance of that task, to the detriment of the
task itself (Dweck, 1991, cited in Brophy 2004). Maehr follows another variation on this division by discussing student goals in learning and designating them as Task vs. Ego goals (1999) and learning vs. performance goals (2000). Focus on the task is also found in Csikszentmihalyi’s (1990) work on flow, where the “optimal” experience is one where a person is fully engaged in what they are doing and that the experience is structured by the task and its attributes, rather than through any external forces.

Overall, the Task/learning/intrinsic side has been portrayed as corresponding to the learners’ being flexible, self-motivated, open to challenge, creative, focused on the task, finding meaning in the task, wanting to do well on the task, learning the task conceptually, and even working well with others on the task. The ego-performance-extrinsic is identified with inflexibility, external motivations like rewards and punishments, lack of creativity, avoidance of challenge, focus on rewards and punishments rather than the direct benefits of the task, lack of meaning in the task, wanting to do well for demonstrative reasons, learning that is narrow and doesn’t transfer, and competitive, non-social views of learning (Deci and Ryan, 1987; Maehr, 1999, 2000; Stipek, 2002). Brophy (2004) suggests that such divisions are not as useful in the classroom, and while it would be nice to run schools on purely intrinsic grounds, it is simply not practical given that schools are places where students are forced to go and classes are full of knowledge they are forced to learn. The focus, Brophy claims, should not be on using intrinsic motivation, but rather on “motivation to learn,” that is, being motivated by the intellectual benefits of engaging in learning activities. Whichever motivational theory is adopted as a frame, however, one thing is clear: if the quality of learning and the meaning derived from it are dependent on the “why” of students’ learning, then it is clear that the student as an active learner must be attended to.

Statement 3: Learning is different for each learner, both in the way they learn and in what they bring to the learning process.

This statement, which goes against the traditional assumption that learning is a uniform process, can be taken in several ways. First, in a link to Statement 1, every learner comes to the classroom with a different set of prior experiences, and so will construct their understandings in different ways. Second, this statement touches on the notion of development, which includes both the idea that humans learn differently at different stages in their growth, and the idea that not everyone develops at the same rate. Since all the students in a class cannot be assumed to be at the exact same place in their development, then they may be learning differently. Finally, research indicates that there are multiple ways of experiencing and learning about the world, that individuals are better at some and worse at others, and that this mix varies between people.

Learners’ prior experiences are central in understanding what they will take from a classroom experience. In the active conception of learning, prior knowledge is seen as the basis for new knowledge, whether the new knowledge is fit into existing structures or used to create or modify cognitive structures. Prior knowledge is clearly foundational in
all of the constructivist approaches already discussed (see references under Statement 1, above) as well as others that have not been emphasized here (such as schema theory, see Anderson, 1983), but it is re-emphasized here to point out its role in differentiating students from one another.

The notion of prior knowledge refers specifically to cognitive structures or ideas that the student brings to a learning process. However, student habits and ways of thinking and acting are also factors in student learning. Peng and Lee (1992) reported that providing learning materials and opportunities had a strong relationship with students’ achievement. Family routine activities are associated with students’ educational outcomes. Both direct and indirect educational activities at home have been found to be associated with children’s academic achievement (Phillips, 1992). Additionally, children whose parents provide supervised daily activities tend to perform better academically (Fehrmann, Keith, & Reimers, 1987). Stretching the point a bit farther, the home environment may even influence students’ ability to act within the cultural milieu of the school, so that what they learn may be determined by whether they have been prepared, by social and cultural interactions, to learn what schools are set up to teach (Bordieu, 1973; Lareau and Horvat, 1999; Lareau, 2002; Ogbu, 1987). For a more detailed discussion, see Chapter 5: Family and Community: The Home-School Collaboration.

The frame of development is also important in considering the non-uniform nature of a student population. Again, Piaget’s theory presents a classic (if no longer entirely supported, see Fetsco and McClure, 2005, p. 130) view of how humans learn differently at different ages. There are four primary stages according to Piaget: sensorimotor (0-2 years), preoperational (3-7 years), concrete operations (8-11 years), and formal operations (begins at the end of concrete operations). As a learner progresses through these stages, their view of the world is radically changed, and they are able to perform very different cognitive tasks with each transition (see Piaget, 1929, 1969, 1970; Piaget & Inhelder, 1969). Bruner (1960) proposes a developmental view as well, but he is more focused on the teaching of school subjects than on experimental cognitive tasks. While he does not believe that all subjects can be taught in their full complexity at all stages, he does support the teaching of subjects at all levels in developmentally appropriate ways---a key idea being the notion of what is developmentally appropriate. Egan (1979), a researcher who spends a lot of time writing about the role of imagination in learning, has proposed his own developmental model. The stages he suggests are the Mythic, Romantic, Philosophic, and Ironic, and deal less with cognitive abilities than with ways of structuring experience and viewing the world. Still, he maintains that developmentally appropriate instruction is vital for knowledge to be meaningful and accessible to use. And, like Piaget and Bruner, he does not give exact ages for transitions between stages.

These are not the only developmental theories around, nor are these theories necessarily the most popular today, but they are examples of the two points that we are trying to make here: 1) as children grow, they learn in different ways, and 2) children do not grow in a uniform fashion. The conclusions to draw from this are that instruction which may be appropriate for one age level may not be appropriate for all, and that there
may be, within one classroom, students who learn in different ways by virtue of their being at different stages in their development.

Finally, research indicates that there are multiple ways of experiencing and acting upon the world, and that not all individuals have the same mix of abilities in this regard. Such is the premise of Gardner’s (1983) work on Multiple Intelligences (see also 1999). Gardner puts forth the idea that rather than one single uniform manifestation of intelligence, one set of ways of acting in the world, of creating, or of understanding, there are many. To be specific, he has identified eight (originally seven, but he added another). Gardner’s intelligences are 1) linguistic, 2) logical-mathematical, 3) spatial, 4) bodily-kinesthetic, 5) musical, 6) interpersonal, 7) intrapersonal, and 8) naturalist. While this review is not of sufficient length to lay out full definitions of each of these intelligences, the authors feel that it is enough to mention them, and to note their great variety. Each student in a given classroom possesses these intelligences in different mixes and to greater or lesser degrees. Gardner himself points out the great challenge this poses to the idea that all students in a classroom will be learning uniformly when he says, “(I)t’s very important that a teacher take individual differences among kids very seriously. You cannot be a good Multiple Intelligence teacher if you don't want to know each child and try to gear how you teach and how you evaluate to that particular child.” (quoted in Checkley, 1997)

All these different findings, put together, show that learning is a varied process and that any classroom may have an eclectic mix of experiences, developmental levels, and ways of encountering the world among its students. For those who are looking at ways to structure curricula and learning environments, the challenges presented by the variations in students’ prior knowledge and experience, different developmental levels, and multiple ways of acting on the world are formidable. As Brophy (2004) notes in regard to motivation, it is not practical for any teacher to build an individual experience for each student, and the same constraint exists in any consideration of student difference. Still, to ignore the variety in the classroom is to rob the educator of important ways of understanding what is or is not happening in the students’ learning process.

**Statement 4: Learning takes place within social and cultural contexts which are central to the learning process.**

Learning is far from a simple interaction between teacher and student. Social and cultural contexts are present in the classroom in multiple ways, and thus must be considered in any account of learning. Learning is a process of negotiation that involves not only teacher and student, but the entire class, the school, language, the curriculum, and the larger society. The interactions of students with all these contexts are important in what and how the students learn. Going farther, some research indicates that learning is social at its very foundation: the knowledge in a student’s head is actually internalized social knowledge, or even that knowledge is not “in the head” at all, but is distributed in the social and physical environment. Some of this work we have already mentioned in
our discussion of constructivism, and will look familiar.

When learning is said to be social, or placed in a social and cultural context, a number of meanings are possible. The work of Vygotsky (1978), for example, not only posits that students are active in their knowledge construction, but defines the knowledge construction process in terms of the internalization of social processes—the activities that the learner performs with others gradually become a part of the learners internal activity, until the other is no longer needed as a support. In this view, then, social context is not seen merely as a classroom environment. Learning itself is a social activity, and the mind, consisting of internalized social processes, is itself inherently social (see also Wertsch, 1985). The researchers who have built from Vygotsky’s work, among them Cole (1996), Lave and Wenger (1991), Rogoff (1990), and Rogoff and Lave (1984) have worked to extend the idea that mind is social and that it is contextualized within social and cultural groups and practices. This means a great many different things, and certainly draws on work other than Vygotsky’s, but for our purposes it is enough to say that a simple teacher-student interaction, with knowledge all in the student’s head, does not seem to fully describe what goes on in the learning process.

Cobb and his colleagues (Cobb et. al., 1993), also mentioned above, further problematize the idea that knowledge is running straight from teacher to student, but they follow a path that emphasizes the classroom as a community. The curriculum is doubly changed here, not only when the students are constructing their personal understandings, but also when the class, as a whole, is coming to an understanding. This class understanding becomes the primary focus of student engagement. The effects of the social dimension on knowledge construction by individuals are also put forth, albeit in quite a different way, in Bandura’s work. Bandura (1986, see also Fetsco and McClure, 2005; Schunk, 2001), who is the founder of what is called the “social-cognitive” view of learning, emphasizes the connection between individual and their context in a three-part interplay of beliefs, behaviors, and the environment. He has emphasized the importance of modeling on behavior, showing how people can learn, without actually doing or by watching. Now the teacher is not just a deliverer of information, or even a mere actor in a community, but can be seen as a learning tool. Palinscar and Brown (1984), in their practice of “reciprocal teaching,” have shown how modeling behaviors can work in action in the classroom.

The importance of the classroom as social context, in the sense of community, is also seen as important in a number of ways. Nearly all of the researchers who were first seen in the discussion of motivation above (see section 2), when they talk about making use of their motivational theories in the classroom, emphasize the construction of a classroom environment that is amenable to certain types of activity or that use of different types of motivation will result in different classroom environments—either way, the connection is clear. Brophy (2004), for example, notes that “it is commonly observed that certain preconditions must be in place before motivational strategies can be effective,” (p. 26), then he sites Glasser and Rogers, as well as bringing in the work of Nel Noddings (1992) who is also cited by Stepanek (2000) as the authority in looking at the subject of caring in
the classroom. Coming from the other direction, Maehr suggests not only that Task/learning goal orientations contribute to more cooperative classroom atmospheres (2000), but may actually be able to better integrate students of varied social and cultural backgrounds (1999). Classroom as community, both as a deliberately structured learning environment and as a place of cooperative endeavor, is at the heart of many American educational reform efforts. The process of classroom community creation and group learning practices are emphasized in the American Association for the Advancement of Science’s Project 2061 (Rutherford and Ahlgren, 1991), the National Council of Teacher of Mathematics standards (NCTM, 2000), the National Research Council’s National Science Education Standards (NRC, 1996), and in Northwest Regional Educational Laboratory’s publication Mathematics and Science Classrooms: Building a Community of Learners (Stepanek, 2000). Additionally, Breen (1986) has suggested that educators capitalize on the natural interactive features of the classroom, and Eggen and Kauchak (2001) note that students gain educational benefits through learning communities that encourage students to take responsibility for their own learning through cooperative ventures.

Thus the classroom, as a social unit and as a place full of students who will interact with their teacher and one another on a variety of levels, cannot be thought of as a neutral and separate place where teacher and student interact, one on one and in a straightforward way. Not only is the classroom environment vital to learning in the sense that it allows certain types of interaction, the environment itself may be what is being learned. Indeed, the classroom atmosphere can be deliberately constructed to foster cooperation, caring, and other behaviors that are seen as desirable, or as amenable to desirable types of learning. The social and cultural are seen here either as very important factors in learning or as the very basis of learning itself. Either way, the educator or policymaker who wishes to put together a successful program cannot ignore these ideas.

**Statement 5: Learning is a connected, conceptual process, dependent on multiple ways of knowing.**

The key concept behind this statement is the idea of transfer, the question of whether, when something is learned in one situation, the student will be able to use it in another. If a student learns a skill in the classroom, even if they indicate on a classroom assessment that they have mastered the skill, it is another thing entirely to be able to apply that skill to a non-classroom situation (Bransford et. al. eds., 1999). Additionally, even good classroom performance does not guarantee understanding, even within the limited classroom situation (Rutherford and Ahlgren, 1991). Knowledge that does not transfer is known, generally, as inert, meaning that the student has the knowledge, but cannot use it outside of a very specific context, such as in response to a direct question in a school setting. Taking up the question of transfer complicates the notion of classroom learning as easy to teach, easy to assess, and easy to apply. Even more centrally, transfer leads us to ask about our intentions regarding school learning---if the knowledge and skills that
students are learning are not useful outside of school, the entire meaning and purpose of schooling is called into question.

One way of looking at the problem of transfer is by using what is called Schema Theory (Anderson, 1983; Anderson and Pearson, 1984), and one of its offshoots, Cognitive Flexibility Theory (Spiro and Jehng, 1990, Spiro, et. al. 1988, Spiro et. al., 1992), both of which come out of a framework called the information processing model of human learning. Theories which follow the general information processing model tend to see the human mind as a sort of computer, processing sense data according to set structures. In schema theory, these structures are schemata, conceptual networks of connections between, and including, pieces of information. It is the network aspect of schema theory that is key here: to put things very simply, the more connections that are formed within these networks, and the more able a person is to manipulate the networks, the more ways the information can be accessed. And when the information can be accessed in more ways, when it can be used in more situations, when it can be taken into other contexts, then it is not inert knowledge. Cognitive flexibility theory, which looks at how information can be used in novel and fluid circumstances, is centered on the notion of transfer. It is Cognitive Flexibility theory that lays out ideas for how such transfer-enabling learning takes place. Emphasis is placed upon the presentation of information from multiple perspectives and use of many case studies that present diverse examples. Such presentations might make use, not only of multiple ways of representing the knowledge in question, but also of multiple media for presentation. The theory also asserts that effective learning is context-dependent, so instruction needs to be very specific. In addition, the theory stresses the importance of constructed knowledge; learners must be given an opportunity to develop their own representations of information in order to properly learn.

Learning as a conceptual process dependent on multiple approaches is supported in other areas as well. Bruner’s (1960) notion of the “spiral curriculum,” where subjects are returned to time and again as the learner develops, shows his interest in developing the deep, flexible understanding that is essential to transfer. The National Council of Teachers of Mathematics (NCTM, 2000) puts forth a similar approach of repeated revisiting and expansion of concepts, matched by a push for authentic assessments so that learning can be measured in ways as varied as it is taught. The push here is for an approach that can be called “conceptual,” where the emphasis is not on facts and figures, but on constructing flexible knowledge structures akin to the schemata mentioned above. A similar push for conceptual understanding, with a call for authentic assessments and a concurrent de-emphasis of the facts and figures approach can be found in the National Science Education Standards (NRC, 1996).

Finally, questions about the usefulness or applicability of learning in schools lead to questions about the purposes of school itself, a useful inquiry for those who would attempt something new. Perhaps school exists to prepare students for the workplace, perhaps also to prepare them for adult responsibilities, maybe to acculturate them, possibly to make them into good citizens. It is also possible that learning in schools might
carry on the project of “helping all individuals achieve their fullest potential” (Bransford et al. eds., 1999, pg. 5) or even “opening us up to aspects of the world that are a potential source of wonder or awe” (Prawat, 1993, pg. 5). Whatever the purpose(s) of school learning, they are in jeopardy if learning is not approached as a conceptual, connected, and many-faceted phenomenon.

Conclusion

It should be reasonably clear, at this point, why the authors decided to begin by pointing out that there are no definite answers about learning, and that open-mindedness is important in asking learning-related questions. The amount of information presented here, while not miniscule, is a speck of dust compared to the vast volume of research that has been compiled on the subject of learning. Still, this review is a beginning. It is a small toolbox, but it does contain a few important tools, and the authors hope that this all too brief examination of learning was helpful as a guide and as a glimpse.

The traditional model of learning, and its assumptions, are not dead, nor are they entirely discredited, and it was not the authors’ intention to imply either state. Instead, the traditional model was adopted as a starting-off point so that those who were familiar with it could see the many other possibilities that have been put forth. The General Statements portray learning as an active process where motivation is important, uniformity cannot be assumed, social and cultural contexts are relevant if not central, and the questions of transfer and quality of experience must be confronted. Even these observations about learning do not cover all the possibilities, but they are a beginning, and they do touch on some vital issues. The educator or policymaker who would study learning so as to try something new is clearly confronted with a massive task. We hope that the tools supplied here will, in some measure, help them to tackle it.
Research and the Five Dimensions of Effective Schools

References


Research and the Five Dimensions of Effective Schools


North Central Regional Educational Laboratory (2004). *Pathways to school improvement.* http://www.ncrel.org/sdrs/


Research and the Five Dimensions of Effective Schools


### Knowledge of Learner Evaluation Rubric

Please indicate on a scale of 1 to 5, your response to each of these statements. Add up your totals and see how you compare.
1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I show concerns for students’ well-being.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I create a supportive environment in classrooms.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. All my students get opportunities to succeed in my class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I have high expectations of every student for success.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. My students clearly know my expectations of them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I am highly interested in teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. My students can tell my enthusiasm for teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. It is important for me that my students are given responsibilities and respects at the same time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I have a rich understanding of the subject I am teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I understand how knowledge in my subject is created, organized, and linked to other disciplines.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I often update my knowledge of the subject matter.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I can explain the aspects of content that are crucial for students to understand before I go to the next topic.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I can address the difficult aspects of the subject matter for students to understand before I go to the next topic.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. I always make adjustments to the subject matter so that the level of difficulty matches my students’ abilities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I carefully link learning objectives and activities when planning each lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. I plan questions for exploring my students’ understanding.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. I always consider my students’ attention span, abilities, readiness, and learning styles when designing lessons.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. I plan the use of appropriate materials and resources to enhance my students’ learning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. My lesson plans include ways to measure the effectiveness of my lessons.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. I consider time constraints when planning each lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. My students know and observe rules and routines for all daily tasks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Please indicate on a scale of 1 to 5, your response to each of these statements. Add up your totals and see how you compare. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. My lessons usually have smooth transitions and continuity of classroom momentum.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. I use appropriate consequences for both appropriate and inappropriate student behaviors.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. I use consistent and proactive discipline.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25. I can always focus classroom time on teaching and learning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26. I handle administrative tasks quickly and efficiently.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27. My class has limited disruptions and/or interruptions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28. My instruction emphasizes higher order thinking skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29. I focus and support inquiries while interacting with my students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>30. My students’ preconceptions and misconceptions of the subject matter are identified and addressed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31. I employ appropriate questioning techniques to elicit and challenge my students’ thinking.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>32. My students need to demonstrate their understanding of concepts and meanings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>33. I use technological tools for instruction.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34. I encourage my students to use technological tools.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>35. I use diagrams, graphs, tables and pictures for teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>36. I encourage my students to use diagrams, graphs, tables and pictures for learning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>37. I encourage my students to use multiple ways to present and discuss their ideas, such as using analogies, drama, metaphors, and stories.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>38. I often link my instruction to real-life situations of my students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39. I help my students make connections from prior learning and experiences to new learning and across disciplines.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>40. I use a variety of teaching strategies according to different subject contents and my students’ various learning styles.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>41. My students do problem solving in my class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>42. All my students are encouraged to fully participate in learning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3 This item is adapted from Professional Standards for Teaching Mathematics (NCTM, 1991).
Please indicate on a scale of 1 to 5, your response to each of these statements. Add up your totals and see how you compare.
1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.
43. All my students are motivated to learn in my class.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
44. I respect and value each student’s ideas and ways of thinking.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
45. I nurture collaboration among my students.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
46. I have multiple ways to gather data about my students’ learning, and analyze assessment data to guide my teaching.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
47. My students can get clear, specific, and timely feedback during the lessons.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
48. I provide feedback on homework.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
49. I integrate homework into the lessons.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
50. My students know the consequences for not finishing homework.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
51. I know my strengths and weaknesses regarding teaching.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
52. I employ data from observations of teaching to improve my teaching practice.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
53. I interact with my colleagues in order to improve my teaching practice.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
54. I think of the needs of my school as an organization when establishing my own teaching goals.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
55. I collaborate with other professionals on instruction, school policy, curriculum and staff development.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
56. I provide support for less experienced teachers.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
57. I know about specialized schools and community resources that can benefit my students.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
58. I am skilled at employing such resources as needed.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
59. I work collaboratively with parents and engage them productively in the work of the school.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |
60. I take advantage of professional development opportunities on a regular basis.  
   | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
   | 1               | 2               | 3            | 4             | 5             |

**Total**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>251-300</td>
<td>201-250</td>
<td>151-200</td>
<td>101-150</td>
<td>&lt;100</td>
</tr>
</tbody>
</table>