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Introduction

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Abstract

This chapter introduces and explains the theme of the book. Higher-quality learning is described and influences on it outlined. The chapters of the book are introduced, and the organization of the book described. We conclude that high-quality learning is an important goal for teachers and learners at all levels of education, that there are many barriers to its achievement, and that teachers and learners can develop ways to overcome these barriers.

It may seem strange to raise the issue of learning quality. If you are concerned with learning, as either student or teacher, it seems obvious that you will be concerned with quality, but do you know how to achieve it? As a student, you want your learning, or a good proportion of it, to be of good quality, but how do you accomplish that? As a teacher, you have a parallel interest in quality of learning. You must confront the issue of quality in every lesson you teach, in every assignment you assess. How should you present material to maximize the students' quality of learning? How far will you push the students in their study of this topic? Is that answer to your question good enough? What grade will you give that assignment? What is the best way to introduce your lesson on electricity or on similes? The answers to each of these questions invoke judgments about quality. So what are these judgments about?

The quality of learning is and should be a key focus for researchers and educators. As society becomes more of a knowledge economy in which productivity has more to do with *working smart* and not just *working hard*, there is growing recognition that just knowing facts is not enough. Unfortunately, many pressures in society and education encourage students and teachers to engage in lower-quality learning and teaching. It is easier to test low-level than high-level knowledge, and as a result, many tests tend to focus on the former. In many cases this leads teachers to teach what is tested (lower-level skills) and students to focus their energies and learning activities on what are limited, and

limiting, educational goals. Lower-level learning may have been an appropriate target for many students in earlier times, but when, in many societies, more than 50 percent of students are aiming to attend university and the best jobs require higher-level skills, it is necessary to reevaluate elementary, secondary, and post-secondary curricula to ensure that more students are prepared for higher-level learning. And as more and more of our everyday living comes to depend on developing effective interactions with people and the environment, the same demand for high-quality learning is becoming apparent across our lives, beyond schools and workplaces. Educational institutions need to ensure that appropriate methods are employed and goals are set to maximize the quality of learning. Doing this effectively depends on knowing more about the nature of high-quality learning and the factors that affect it.

Our goals in this book are to bring together many different views on the quality of learning and the research that supports them, and to stimulate further and more coherent research and development on ways to enhance the quality of learning. To accomplish these goals, we invited a number of prominent authors to consider the quality of learning as it is manifested in their fields of research and development. We asked them to contribute chapters that could be concerned with theoretical analyses, or reports of empirical research, or think pieces that would stimulate new directions in research and practice. We wanted the book to speak to practitioners, to teachers at all levels of education, and to students at undergraduate and postgraduate levels. For teachers, we hope that the book will provoke further consideration of key topics such as how they might design their lessons and how they might design and situate their assessment. We believe that teachers at all levels, from preschool to graduate school, will benefit from a deeper understanding of what constitutes high-quality learning and what affects it. For students, we hope that the book will stimulate new thinking about how they might act as they undertake their learning.

In the remainder of this chapter, we define what we mean by quality of learning and describe the factors that influence the quality of learning: some of these are inherent characteristics of the learner, others are more under the control of learner or teacher. We then provide examples of what teachers and learners need to know about high-quality learning: these are the gaps that motivate this book. Finally we describe how the book is organized and introduce the chapters.

What is Quality of Learning?

Learning refers to both the knowledge that one has acquired and the process of acquiring that knowledge. Variation in the quality of both of these aspects

of learning may be seen in children and adults, and at all levels of education. Low-quality learning will result in knowledge that is narrow in scope, fragmented, and does not lead to other learning. As Bruner (1966) noted, such learning lacks power: it does not enable learners to use that knowledge to tackle new and different problems they face in their studies and in their lives. High-quality learning is what schools and society believe we should be aiming for: learning that results in knowledge that is extensive, integrative, and generative so that it supports transfer. There are, of course, many other descriptors that could be applied, but these capture the core of what we mean by high-quality learning. Let us consider each of these aspects in turn, and then turn to learning as a process.

Extensive. High-quality learning must be extensive in the sense that it must include and be based on as large an array of relevant information and experience as possible. In this way, quality and quantity are not antithetical but rather complementary. Having knowledge about one aspect of a problem or domain is helpful, but it is only useful when other required information is available. For example, consider a science student who knows that force equals mass times acceleration. This is indeed a useful relationship to know, but if the definitions of mass and acceleration are not known, the student would not be able to accomplish much. Several decades of research on expertise have shown that a prerequisite for being deemed an expert is extensive knowledge, generated through mindful deliberate practice, of one's discipline or domain of activity. As an example, Ericsson (2006) has estimated that expert musicians have engaged in 10,000 hours of mindful practice by the time they are 20 years old. The "mindful" part of this description of expertise reminds us that high-quality practice as well as quantity of practice is required for high-level performance.

Integrative. Extensive knowledge is not enough, however: the knowledge must be linked, so that relationships between the parts are well established. As relationships are perceived and created, information becomes clustered within or under new, overarching ideas that encompass the original information. These overarching ideas are necessarily more abstract than the original ones because they are less tied to the original information or to specific contexts, and so have been described as being higher or deeper ideas (e.g., Biggs & Collis, 1982). If knowledge is extensive but not integrated, it is fragmentary. For example, being able to recite an entire Shakespearean play requires extensive knowledge, but if such knowledge is not well integrated, it would be unlikely to enable one to identify the key themes of the play or discuss the motives of the characters.

Generative. When learning is both extensive and integrated, it can become generative. By this we mean that it can create or lead to new knowledge

(Wittrock, 2010). Such knowledge can be seen in Bruner's terms to have increased power. For example, learning about the economies of several different countries may first lead to integrated knowledge about each of them, but then may lead to predictions about countries that have not yet been studied, or to a theory about how countries' economies and geographies are related. When knowledge is extensive, integrated, and generative, it supports transfer – that is, the application of the original knowledge in a new context (Barnett & Ceci, 2002). This, of course, is the main purpose of learning, because the situation in which one has to apply one's knowledge is seldom identical to that in which it was learned. We do not teach children to read *The Cat in the Hat* (Seuss, 1957) because we want them to be able to read just that one story; we also want them to use the literacy skills they employ in reading that book when they read any book. Well-developed literacy skills are thus transferable to other contexts, and the same is true for knowledge in other domains. More broadly, we want learners to be able to use the knowledge they derive or develop from any specific learning instance in other learning opportunities. When transfer is difficult to achieve, one contributing factor is that the knowledge relevant to the transfer task is of low quality (i.e., it is not extensive, integrated, or generative).

The Process of Learning. The challenge for learners is *What to do* when learning? Any learning situation allows a multitude of tactics to be used: for instance in reading a textbook chapter, students may read "normally" (as they might a mystery novel for pleasure), or they might highlight parts of the text, take notes, draw a diagram of the text's meaning, attempt to summarize a part of the text with the book closed, or discuss the chapter with their peers. If studying for a test, they could reread the textbook, highlight sections again (perhaps in a different color), rewrite their notes to be more coherent, test what they know with cards having questions on one side and answers on the other, discuss possible test questions with their fellow students, or consider how this course's content is related to that of other courses. In high-quality learning, these tactics are selected, controlled, and monitored by strategies, and strategies operate under the guidance of an understanding of the purpose of the learning – that is, under metacognitive control (Winne, 2011). Learners need to understand the strengths and weaknesses of the various tactics and strategies with respect to various purposes if they are to attain high-quality knowledge.

What Affects Quality of Learning?

Three broad factors and their interrelations are involved in determining the quality of learning. The first of these broad factors refers to dispositions

toward learning. Dispositions are the tendencies that learners have to behave or think in particular ways; they include emotions, types of motivation, strategies, goals, approaches to learning, and willingness to engage in critical thinking. High-quality learning is effortful and therefore requires appropriate dispositional states, including appropriate motivational knowledge and intentionality on the part of students and teachers. As we will see in several chapters in this book, dispositions can be enduring characteristics of learners, but they can also be influenced by teaching and other environmental features.

The second factor describes the conditions under which learning takes place, including the climate established for the classroom, the instructions that students are given, the nature and organization of material they are shown, the activities in which they are encouraged to engage, and the way in which they are tested. Skilled teachers present their students with material and activities that encourage key features of quality such as integration and provide time to demonstrate how this integration can be achieved. Skilled teachers also assess learning in ways that go beyond knowledge of simple facts and engage students with problems that require them to adapt their knowledge and transfer it to a new context.

The third factor concerns the learning processes that the learner employs and the resulting knowledge structures in memory. These knowledge structures determine, for instance, whether the knowledge developed by the learner is integrated or fragmentary, elaborated or sparse. The resulting knowledge structure is the core of the model, because without it the benefits of effective dispositions and supportive instructional conditions go unfulfilled.

These three broad factors together determine the quality of learning. They are linked, so strengths in one can compensate for weaknesses in others, just as weaknesses in one can undermine the benefits of others. A complete understanding of the quality of learning requires understanding of these broad factors and their interrelationships.

What Teachers and Learners Need to Know

Comments about quality are so numerous and commonplace in teaching and learning that it is easy to assume that we have a clear understanding of what it is. For example, consider a group of teachers of history or chemistry who are assessing students' final-exam responses. The teachers will aim to identify different levels of quality of response and will most likely focus on students' use of history or chemistry content knowledge in answering the questions. They will expect the responses to differ in quality. If asked about these differences

in quality of response, the teachers will probably explain them in terms of differences in problem-solving or writing capabilities and/or differences in the quality of the students' knowledge about the topics included in the exam. The teachers may also refer to factors such as effort and persistence, practice, real understanding, being well organized and systematic, asking questions, carefulness (e.g., checking calculations), or writing clearly. We would not be surprised if the teachers' discussions about the quality of learning were mostly phrased at this broad level. When Woolfolk-Hoy and Tschannen-Moran (1999) looked for more detailed teacher knowledge about the way in which small groups would influence student learning, they found that such knowledge could not be made explicit. In their study of a group of Scottish teachers who had, on average, been teaching for seven years, Maclellan and Soden (2003) also noted a lack of detailed knowledge about learning processes, including knowledge about the role of students' existing knowledge in their subsequent learning. For beginning teachers, there is also evidence that knowledge about learning – and, by implication, about learning quality – is often quite general. Elen and Lowyck (1999) expressed concern about the quality of their students' knowledge, as did Woolfolk-Hoy and Tschannen-Moran (1999) in a report on teacher education students in the United States:

> [Prospective teachers] lack understanding of the connections between teaching strategies and students' learning … our students have great difficulty explaining the mechanism of learning and how teaching influences these processes.… Few students are able to connect the activity to cognitive processes that lead to learning, and few prospective teachers articulate what they want students to learn in ways that adequately represent academic content or cognitive outcomes. (p. 280–281)

If the students involved in writing the exam were interviewed about what contributed to their responses, they might be even less able to report on the precise nature of the responses that were awarded different grades, and on how their learning processes led to the outcomes. Peterson (1988) pointed to a lack of what she termed students' "cognitional knowledge" – knowledge about what cognitive processes are involved in learning. Elen and Lowyck (1999) found that the students they observed lacked systematic vocabularies about instruction and did "not seem to have articulate conceptions about the way in which an instructional environment may support their cognitive processing and/or control activities" (p. 157).

Both teachers and students should have greater concern with what it is that makes some learning of higher quality than other learning. Teachers and students need to have explicit knowledge about specific processes involved in

learning and how those processes can result in high-quality knowledge. There is a growing realization that we need to place explicit emphasis on the use of such knowledge in classrooms. Indeed, Kistner et al. (2010) reported that "a great amount of strategy teaching takes place in an implicit way, whereas explicit strategy teaching is rare" (p. 157). Because students to a large extent direct their own learning and because teachers try to facilitate that learning, we see that a more explicit focus on the quality of learning is warranted.

In the broad area of study that focuses on learning and instruction, there is a great deal of commentary, research, and theory about the quality of learning. The goal of high-quality learning is a central feature of many school and university Web sites. It is central to the aims of education expressed in policies for cross-national bodies (UNESCO, 2004). But there is much less concern with analysis of the nature of high-quality learning. Further, although there is now an extensive body of research on procedures that stimulate high-quality learning, this work is often fragmented and in need of synthesis and more explicit examination. In this book we bring together current research on the nature of high-quality learning and by so doing aim to present a more comprehensive and integrated view of the factors that facilitate or inhibit it.

Organization of the Book

The remainder of the book is organized according to the factors associated with quality of learning given primary emphasis in each chapter. This organization is at best rough; most chapters address more than one factor.

The four chapters in Part A of the book focus primarily on *dispositions*. In Chapter 2, Noel Entwistle considers different ways of thinking that may contribute to the quality of learning demonstrated by university students and describes how these are related to learning environments. Augusto Riveros, Stephen P. Norris, Denyse V. Hayward, and Linda M. Phillips tackle the conceptual basis of dispositions in Chapter 3 and demonstrate that changes in dispositions can alter learning. In Chapter 4, Maggie E. Toplak, Richard F. West, and Keith E. Stanovich examine the disposition toward rational thinking and explain how this disposition can be measured and improved. In Chapter 5, Robert H. Cantwell, Jill J. Scevak, Sid Bourke, and Allyson Holbrook describe the metacognitive, affective, and self-regulatory dispositions of doctoral students, individuals who are striving to achieve a quality of learning that will advance the knowledge in their chosen field.

Part B includes chapters addressing primarily methods of instruction that lead to high-quality learning. In Chapter 6, John Biggs describes an approach to university teaching that encourages learners to become actively involved

in constructing their own knowledge. In Chapter 7, Michael J. Lawson and Helen Askell-Williams analyze the features of high-quality learning and knowledge, as well as methods to improve students' knowledge of how to learn effectively. Carl Bereiter and Marlene Scardamalia analyze the nature of understanding in the humanities and social studies in Chapter 8, describing the role of theory building in improving the quality of students' learning. In Chapter 9, Matthias Nückles, Sandra Hübner, and Alexander Renkl examine the effects of writing learning journals on students' cognitive and metacognitive learning strategies. Allyson Fiona Hadwin and Philip H. Winne describe their model of self-regulated learning in Chapter 10 and discuss instructional methods for improving students' quality of learning that derive from it. In Chapter 11, Neil H. Schwartz and Richard F. Schmid examine the way technological tools need to be understood by teachers and how the devices can be successfully used to enhance the processes and outcomes of learning.

Part C focuses on students' learning processes and the knowledge structures they build. In Chapter 12, Panayiota Kendeou and Gregory Trevors examine learner characteristics and text properties that support high-quality learning in reading comprehension. In Chapter 13, M. Anne Britt and Jean-François Rouet describe the cognitive processes involved in developing mental representations from the study of multiple documents. In Chapter 14, John R. Kirby, Kate Cain, and Bozena White examine the role of deeper processing in establishing mental representations of text. In Chapter 15, Wolfgang Schnotz, Christiane Baadte, Amy Johnson, and Christoph Mengelkamp describe the cognitive processes learners use when learning from text and pictures, describe design principles for presenting text and pictures in instruction, and offer methods for improving the quality of students' learning. In the final chapter we identify issues that will continue to challenge researchers and teachers as they investigate the nature of high-quality learning and how it can be enhanced.

In Search of High-Quality Learning

As a whole, these chapters demonstrate that we have learned a great deal about what the quality of learning is and how to improve it. However, they also emphasize how interdependent the various components are. Attempts to improve teaching methods may be limited by students' dispositions, and it may be better to begin by attempting to alter some of those dispositions. The effectiveness of teaching learning and study strategies may pivot on the students' understanding of the nature of high-quality learning and willingness to adopt a self-regulatory stance. Assessing student learning not only

provides instructors with an opportunity to determine the students' quality of learning, but also provides students with guidance as to what type of learning and performance is expected. Finally, learners need to understand that there is more to effective learning than effort; they must develop a more explicit understanding of the nature of learning and of the relationships among goals and learning processes, and they must accept responsibility for the regulation of their own learning.

These suggestions for actions that can be taken by teachers and learners to achieve high-quality learning reflect the emphasis placed on development throughout the chapters. The authors show that high-quality learning can be enhanced through mindful action on the part of both the teacher and the learner. They propose – and provide evidence for their views – that teachers can encourage the development of high-quality learning in the design of their everyday lessons. They also challenge both researchers and teachers to see that the ability to engage in high-quality learning is not mysterious: it can be developed and improved.

We see this emphasis on development and enhancement as providing a challenge for teachers and learners across all the years of formal education. Responsibility for the outcomes of formal education is shared between teachers and learners. A challenge for teachers, and for those who teach teachers, is to further develop their abilities to set up the conditions and procedures that will encourage learners to act and to develop knowledge in the ways discussed in these chapters. An additional challenge for teachers at all levels is to help learners understand the learners' role in acting effectively within the environments set up by their teachers. This is a difficult but necessary responsibility, and one that is likely less readily accepted by the wider society. Most parents are required to send their children to school, so it is understandable that they should expect the teachers in the school to have a responsibility to ensure that learning does occur. Yet it must also be accepted that by the end of the lesson, or seminar, it is the learner who must select relevant information from the teaching and then transform that information so that it will have the characteristics of high-quality learning. It is doubtful that many students understand this shared responsibility for learning outcomes as they attend their lessons or seminars. Teachers must work on making this shared responsibility more apparent to students.

Although the importance of high-quality learning is espoused by many and denied by none, we see many barriers to its achievement. Some of these barriers exist at the institutional level. The chapters in this book pose important challenges for policy makers at the institutional level. The analyses of learning environments, curriculum organization, assessment, and learning approaches

encouraged in classes suggest that the quest for high-quality learning is in many cases compromised by policy and practice. The chapters in this volume identify some of the ways these policies and practices deter students and teachers from the pursuit of high-quality learning. Teaching and assessment at all levels of education must address learning at a variety of levels of quality, but too much focus at the lower levels may allow students to "pass" without having even tried to engage in high-quality learning and may convey the message to students that low-level learning is all that is required. High pressure on teachers and learners can narrow their focus and increase affective distress. A curriculum that requires teachers and students to "cover" too much content can prevent adequate depth of study. Students are under pressure to achieve highly, but they may often interpret high achievement to mean high grades rather than high-quality learning. In the worst cases, students may conclude that high-quality learning is counterproductive in the short-term pursuit of high grades. Both teachers and students can mistake superficial activities and accomplishments as the real goals of education unless there is a pervasive and persuasive emphasis on the quality of learning.

We have been excited by the ideas presented in the chapters in this book and we hope that further consideration of these ideas will suggest ways to work around the barriers noted earlier. We hope that this book provokes readers to reconsider the nature and determinants of high-quality learning and that such reflection stimulates further debate about, commitment to, and achievement of higher-quality learning.

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