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A Quality Improvement Approach to Student Learning

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This paper describes a Quality Improvement Instructional Approach whose purpose is to improve the quality of undergraduate education by helping students realize their potential for learning in traditionally-taught university courses, and particularly those in the economics major. The innovation comes in combining three key elements of Total Quality Improvement — customer focus, student involvement, and continuous improvement — and applying them to university instruction. This paper concentrates on customer focus which refers to the knowledge and skills — proficiencies — that students are expected to demonstrate by the time they complete a course or graduate in the major. These proficiencies reflect what institutions teach and what the public (including employers) expects of new graduates. Particular attention is given to determining who are the customers of the economics major and the unique role of students as customers.

The burgeoning efforts of American colleges and universities to implement total quality improvement (TQI) or continuous quality improvement (CQI), have met with considerable success in their operational functions (Chaffee and Sheer, 1992; Miller, 1991; Sheer and Teeter, 1991), but made relatively less progress in penetrating their instructional and research activities (Ellis, 1993; Spanbauer, 1992; Williams and Loder, 1993). While academics quite naturally suspect approaches developed and used in the private sector, adapting a quality approach to teaching and learning offers attractive possibilities for improving both instruction and student learning.

This paper describes a Quality Improvement (QI) Instructional Approach whose purpose is to improve college and university instruction (Hansen, 1993a). Its broader goals are two-fold. One is to enhance the quality of undergraduate education, by helping students realize their potential for learning in traditionally-taught university courses. The other is to help faculty members appreciate the substantial possibilities for learning that reside in students. This approach has been developed and tested in several courses taught at the University of Wisconsin-Madison's Department of Economics.

The QI Instructional Approach consists of three principal elements — Customer Focus, Student Involvement, and Continuous Improvement. These elements are not new; they are derived from TQI (Scholtes, 1988) and particularly the Deming philosophy (Deming, 1986). Putting these elements together and applying them to higher education creates a profound shift in our thinking about the nature of the educational process. In this context, Customer Focus refers to the proficiencies — the ability to combine content knowledge and related skills — that students should be able to demonstrate by the time they graduate, based on what employers and others expect of new graduates and on the capacity of faculty to help students be able to meet those expectations after they enter their post-schooling lives. Student Involvement refers to active student participation in the teaching-learning process; such participation is essential in triggering the intrinsic motivation of students to learn. Continuous Improvement refers to an on-going process of eliciting systematic feedback from students and from the public (including employers). This feedback can help remove obstacles to learning, improve teaching practices, give sharper focus to the teaching-learning process, and track the progress of students in mastering the knowledge and skills expected of them.

My interest in these matters began some years ago when I began asking how well the department's economics courses served its undergraduate economics majors. These efforts took a new turn several years later when I began learning more about quality improvement. I soon became aware of the substantial overlap between my sometimes unfocused efforts and the structured approach to quality improvement presented in the quality improvement literature. This process led to an eventual refocusing of my courses and teaching approach. The feasibility and effectiveness of the resulting QI Instructional Approach has been tested in two undergraduate economics courses (one for majors and the other for students taking their first economics course). Unfortunately, this approach has not yet been tested in other courses and other economics departments. What can be said is that my students consistently

indicate strong satisfaction with my QI oriented courses. In addition, I believe these students are now better able to benefit from the teaching-learning process and, in turn, meet the needs of those who will subsequently draw on their knowledge and skills.

The following discussion concentrates on the concept of Customer Focus, largely because so little attention has been given in higher education to thinking about who are the customers and what are their needs.

Customer Focus: Proficiencies

Specifying the proficiencies expected of graduating economics majors provides the missing link in the underdeveloped connection between the particular economics courses students take and the faculty's often rather ill-defined notions about what it means to have majored in economics. Clearly, an economics major is more than a collection of discrete courses. Rather, it is a process that reflects the mastering of a body of knowledge and skills, and even more importantly, demonstrating an ability to use this learning in various settings. A structured program of courses, the usual way of defining the major, can give general direction toward attaining this goal. However, much more is required to convey the meaning and significance of the undergraduate major (Association of American Colleges, 1991a, 1991b) and of the economic major in particular (Siegfried, et al., 1991a, 1991b).

Faculty members rarely give much thought to the knowledge and skills students must possess and be able to use after they graduate. They operate on the vague assumption that what students learn in the mixture of individual courses they complete automatically cumulates to something of greater significance — what we might like to describe as well-educated graduates who are knowledgeable about economics. We rely on the structure of the curriculum to accomplish this goal, even though curriculum structure is at best a blunt instrument for shaping and deepening student learning. We also rely on standard teaching approaches even while recognizing that student proficiencies are best developed through a careful structuring and sequencing of content, along with ample opportunities for students to practice using their knowledge and skills.[1]

Faculty also focus on their own courses and students, making certain that the requisite content is covered and using the prevailing instructional technology, for the most part, lecturing, to present that content. Their assessment procedures concentrate heavily on content, requiring students to display their learning in traditional academic fashion, through multiple-choice exams, problem sets, and, much less frequently, oral presentations, team projects, or research papers. Relatively little attention is given to how well students can use their knowledge beyond the classroom.

The critical task is to decide what students should be able to do with their knowledge and skills — what proficiencies are to be nurtured in students. Some years ago I laid out a set of proficiencies for undergraduate economics majors (Hansen, 1986). What emerged were five proficiencies that go beyond the substantive knowledge that every economics major presumably acquires. These proficiencies focus on the ability of students to use their knowledge in varied ways, similar to what they will be called upon to demonstrate in their jobs and other roles after college graduation. A description of these proficiencies and how students might demonstrate their mastery of them appears in Figure 1.

This list of proficiencies evolved out of a careful, wide-ranging process. Most obviously, the list is based heavily on my own teaching experience, augmented by the limited research on the links between what students learn in college and how, as graduates, they use that knowledge. This information was supplemented by responses from on of the periodic surveys completed by our recently graduated economics majors a year or so after receiving their degrees. The respondents offered intriguing answers to such open-ended queries as how the structure of the major might be improved and what features of the major proved to be most beneficial to them in their current jobs. From these responses, it became immediately clear that the ability of students to use their knowledge and skills varied greatly.

With this as background, I surveyed, often in direct meetings, numerous employers, including those in the private, public, and nonprofit sectors, to learn more about what they expected of the new graduates they hired. In addition to reasonable levels of literacy and numeracy, they wanted young people who could carry out tasks independently, work in teams, and get the job done. They viewed themselves quite naturally and properly as the university's customers for its graduates, and more specifically, as customers for the economics graduates we help train and, in effect, certify.

The term "customers" poses an important stumbling block for most faculty members. Many feel so uncomfortable with the term that they reject out of hand the QI approach with its attention to serving its customers more effectively. They reason that if quality is defined as meeting the needs

[1] Other possibilities include participation in honors programs, independent research projects, and small, faculty-taught seminars.

Proficiencies for the Undergraduate Economics Major

Gaining Access to Existing Knowledge

- locate published research in economics and related fields
- locate information on particular topics and issues in economics
- search out economic data as well as information about the meaning of the data and how they are derived

Displaying Command of Existing Knowledge

- summarize (for example, in a short monologue or written statement) what is known about the current condition of the economy
- summarize the principal ideas of an eminent living economist
- summarize a current controversy in the economics literature
- state succinctly the dimensions of a current economic policy issue
- explain key economic concepts and describe how they can be used

Displaying Ability to Draw Out Existing Knowledge

- write a precis of a published journal article
- read and interpret a theoretical analysis, including simple mathematical derivations from an economics journal article
- read and interpret a quantitative analysis, including regression results, reported in an economics journal article
- show what economic concepts and principles are used in economic analyses in newspapers and news magazines

Utilizing Knowledge to Explore Issues

- prepare a well-organized and well-written analysis of a current economic problem
- prepare a memorandum for a superior that recommends some action on an economic decision faced by an organization

Creating New Knowledge

- identify and formulate a question or series of questions about some economic issue that will facilitate investigation of the issue
- prepare a five-page proposal for a research project
- complete a research study with a polished paper

Figure 1. A description of proficiencies and how students might demonstrate their mastery of them.

of customers, and if the customers are the department's undergraduate majors, the QI approach is too simplistic. Moreover, the idea that every effort should be made to serve or "delight" these customers strikes most faculty as the antithesis of good teaching and effective learning.

In fact, several groups and levels of customers exist. At one level we have internal customers, represented by those faculty teaching advanced courses who want their students to be well prepared in prerequisite courses. We deal with this matter by insisting that courses build on one another and that what faculty members teach in these courses is at the appropriate level of difficulty. To the extent students are not properly prepared, they cannot assimilate, or "buy," what is offered in more advanced courses.

While the immediate customers of higher education are students, the ultimate customers comprise several diverse groups who nonetheless have quite similar interests. One group is employers who want to utilize the knowledge and skills of the recent college graduates they hire. Another group is the parents of students who want their offspring to be well enough prepared so they can secure good jobs and live fulfilling lives. University officials want to be

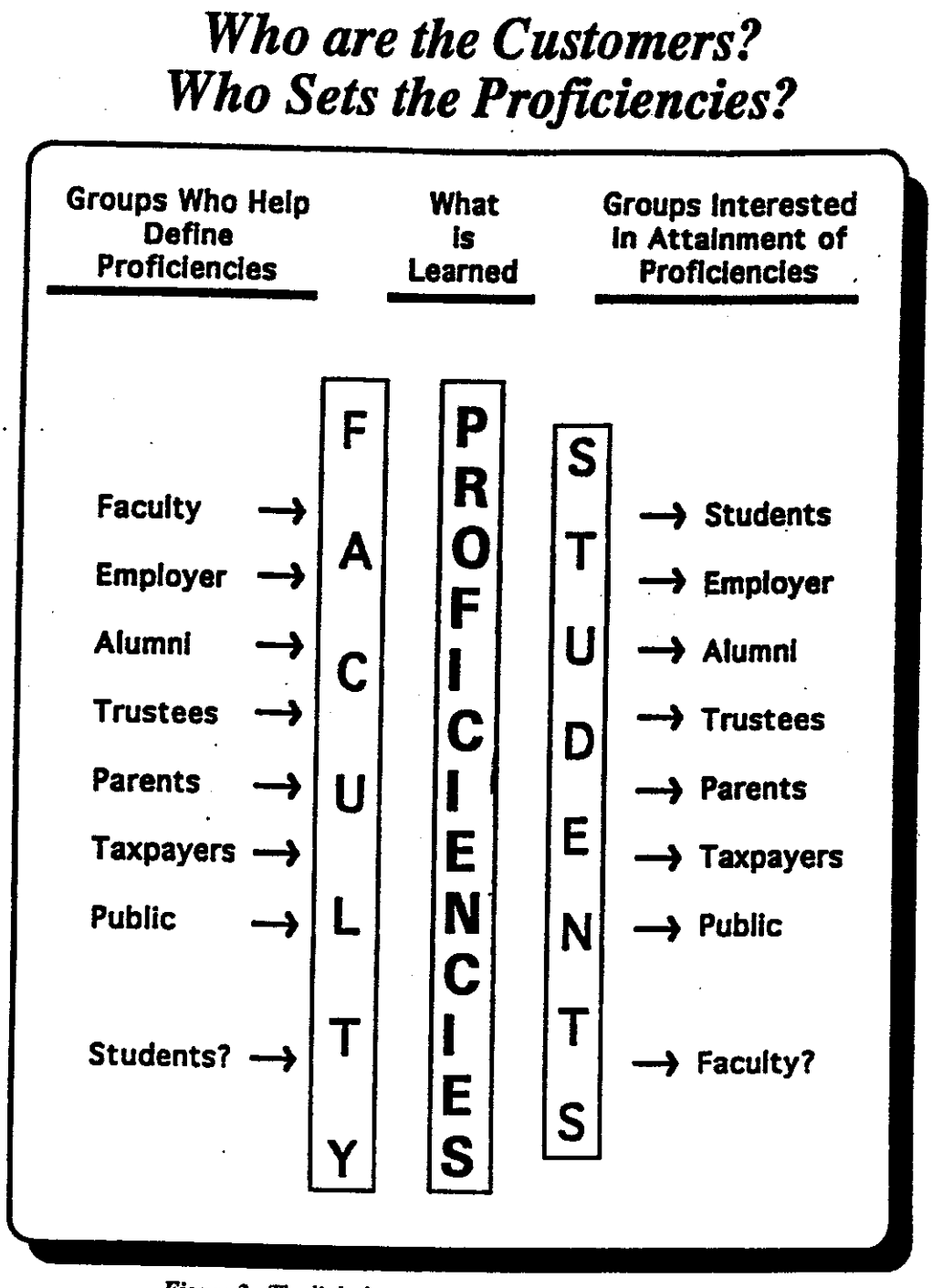

Figure 2. The links between proficiencies and customers.

able to assure the public that their stewardship is effective. These officials are obviously aiming at pleasing still another group, taxpayers who are the ultimate customers, at least for publicly supported higher education, by virtue of their generous tax support for colleges and universities. Meanwhile, the general public wants to be reassured that higher education institutions are performing with reasonable effectiveness. What unites these groups, and perhaps others, is their desire for evidence that economics graduates, in addition to displaying the attributes of educated people,[2] possess a substantive knowledge of economics and are also proficient in using that knowledge, in ways that go beyond what is typically required in the classroom.

[2] Included under this rubric is some knowledge of the humanities, arts, and science, as well as the ability to think critically, communicate effectively, develop problem-solving skills, etc.

The links between these proficiencies and customers are illustrated in Figure 2.

It places proficiencies at the center of the learning process. Faculty members facilitate the process of acquiring these proficiencies. Students are the object of the process, as they learn and gradually internalize these proficiencies. The reason for acquiring these proficiencies is that external customers — ranging from the most direct and obvious customers, employers, to the least well-defined group, the general public — want and expect students to acquire these proficiencies. A broader view of what society expects of higher education is described by Bowen (1977). These groups of customers are listed on the right-hand side of Figure 2.

Just as the various customer groups are interested in whether students gain these proficiencies, they in turn can play an important role in offering guidance to faculty about what proficiencies should be developed through the undergraduate economics curriculum; the groups that can provide such feedback are shown on the left-hand side of Figure 2. The possibility for outside feedback to faculty is essential, particularly if the proficiencies new graduates bring with them are deficient or do not match those that customers need. Yet, most economics departments, indeed, most colleges and universities, do not systematically solicit such feedback on the undergraduate major.

Economics departments do, however, receive fairly regular feedback about the training they provide to their new doctorates. The extent and quality of this feedback, which is mostly informal, varies considerably, ranging from private sector and non-profit sector employers who hire applied researchers, on to liberal arts colleges which seek superior teachers, and on to research universities which want to hire new assistant professors on the cutting edge of research. This understandable diversity of needed proficiencies creates difficulties in designing and revamping the curriculum. For example, what weights should be given to the needs of those "customers" who hire new PhDs?[3] Perhaps because of this diversity of demand and the difficulties of formulating different instructional tracks that can satisfy these numerous and diverse groups, departments have found it easier to avoid responding, and for the most part they continue doing what they have been doing. Consequently, they devote little attention either to how well they perform in meeting the needs of their external customers or to how they might do a better job of meeting those needs. This neglect is most apparent at the undergraduate level, at least at major research universities.

The view that students are the principal customers and can play a major role in shaping the proficiencies taught is misplaced. Typically, students do not know enough to understand what proficiencies they should be acquiring (this is indicated by the question mark after "students" at the lower left in Figure 2). That information gap can probably be filled by recent alumni, who on the basis of some years of real world experience, more keenly appreciate what knowledge and skills are of most value to new economics graduates. Still other groups may want to help shape the definition of these proficiencies, either because they are consumers of these proficiencies or have special knowledge of them. Students can with proper help come to see themselves as customers. Only as this occurs will they be able to help define the proficiencies they need. Yet the task is a difficult one, particularly in the current climate.

Whether faculty are much concerned with students' acquisition of these proficiencies is also in doubt (indicated by the question mark after "faculty" at the lower right in Figure 2). Until faculty come to a clearer understanding of their role in helping to prepare what we might describe as well-educated graduates who are knowledgeable about economics, their capacity to help students acquire these proficiencies will remain largely untapped.

The proficiencies approach can be of great assistance to students, simply because it represents them as customers. It does so by helping students visualize the outside world of employers and the public as the customers whom they must serve. They are enrolled in college, supported by resources from taxpayers, contributors, parents, and others, to acquire the proficiencies that will help them succeed in a wide variety of endeavors. Students will come to realize that to acquire these proficiencies, they must become customers of the instructional services and related learning opportunities offered by the faculty, the department, and the institution. As this occurs, the faculty will find it easier to view students as customers of their instructional services; they will sense the intensified desire among students to learn the subject matter and at the same time develop their proficiencies in the major.

The implications of this view are clear. Students must satisfy the expectations of the faculty if they are to gain the proficiencies required by future employers and other outside customers. Similarly, faculty must work to meet student expectations of guidance and help in acquiring the proficiencies they will need after graduating.

The advantage of this approach is that customer focus becomes deeply embedded in the teaching-learning enter-

[3] For a recent, comprehensive analysis of "customer needs" for new economics PhDs, see the work of the American Economic Association's Commission on Graduate Education in Economics (Krueger, 1991; Hansen, 1991; Kasper, 1991).

prise. This customer orientation contrasts sharply with the tendency for students and faculty members to think in terms of the prevailing "currency" of higher education, e.g., courses, course credits, and course grades. The prevailing mode of thinking neglects the knowledge and skills these courses are established to develop. It also ignores the possibility of using assessment approaches and grading practices to measure the acquisition of not only narrow subject matter content but also the knowledge and skills embodied in the proficiencies.

In focusing on the customer, it is important to strike a balance between what customers need — whether we think of them as students or as the larger public which draws on the proficiencies acquired by students — and what institutions can provide. To let customers dominate in determining the curriculum ignores the strengths and capabilities of institutions and their faculties. Thus, mandates developed and imposed from outside may fail to achieve their goals even if these mandates reflect what customers or at least some customers want. If there are to be mandates, they need to be developed jointly with colleges and universities so they are not doomed to fail by asking too much. At the same time, institutions must seek to meet the larger needs of the society that created them and now supports them. In this sense, colleges and universities may be able to create new sources of support by responding more effectively to the changing needs of the customers of their graduates.

The customer focus described above neglects the interdependence of the undergraduate curriculum. It should be apparent that no single course can produce major gains in student proficiencies. Instead, the entire undergraduate curriculum must be organized and integrated so that step by step through four years of college, students steadily build their knowledge and skills. Even if an entire economics department seeks to produce these proficiencies in their graduating majors, there is no assurance that instruction by departments offering freshmen-sophomore courses will have given students a strong start in building their proficiencies. In other words, instructors in general education courses may fail to realize that instructors in advanced courses in the major are their customers, meaning that the development of proficiencies must begin in lower level courses and continue in higher level courses. The only way to ensure that internal customers are satisfied is to agree upon a sequence of courses that does indeed help students develop their general education proficiencies; this will make it possible for courses in their major to develop major-specific proficiencies of the kind discussed above.

To conclude, there is no top-down method of assuring that appropriate attention is given throughout the undergraduate program to the acquisition of these proficiencies. A major part of the problem stems from the elective system which presumes that learning is not cumulative. The opposite is the rigidly defined curriculum found in, say engineering, where courses not only build upon one another but requirements are so numerous that few students have time for elective courses. Most undergraduate programs lie somewhere between these extremes. One possible solution is a more careful structuring of graduation requirements. Just as there are multiple customers whose needs must all be coordinated, in order to ensure that students attain the desired proficiencies, multiple levels of the university must work in concert to develop a meaningful QI approach. The university (or school), the major department, and the individual student need to consider themselves as partners in a team effort to build a quality product (i.e., graduates equipped with those proficiencies) which will meet or exceed the expectations of those many customers.

Student Involvement: Active Learning

University teaching is dominated by the lecture approach or, in the case of large introductory courses, lectures supplemented by discussion and/or laboratory section meetings led by teaching assistants. Even in small classes, faculty members typically find it easier to lecture than to encourage probing discussions that help students learn how to think broadly and deeply about the subject matter. This practice continues despite mounting evidence that students benefit from active involvement in the learning process (Light, 1991).

Professors already know from experience that collaborating on research, testing ideas in seminars and public lectures, and the very act of teaching are all powerful methods of learning and clarifying their thinking. Some faculty have also discovered that closer interaction with students in the classroom makes teaching a more interesting and challenging enterprise. Moreover, active involvement and especially the ability to work effectively with others, as through team projects, pay off in the labor market where people must work cooperatively and collaboratively.

How do we transfer this approach to the classroom? Faculty must call on students to do much more writing and to complete more writing assignments, to participate in small discussion groups, and to engage in collaborative learning, all of which can help strengthen the first four proficiencies listed in Figure 1 (Hansen, 1993b). Promoting the more difficult proficiency, "creating new knowledge," can be accomplished in traditional seminars; with larger classes it can be facilitated by organizing students into teams to undertake challenging, hands-on-projects (Hansen, 1993a).

Continuous Improvement: On-going Evaluation

Knowing how well the needs of both immediate and ultimate customers are being met is difficult under our conventional approach to instruction and its evaluation. One or, at most, two within-semester examinations enable students and faculty members to assess what students have learned before the final examination. These examinations, however, typically do little to pinpoint the problems students experience in mastering the subject matter. Unless teachers require other types of assignments, e.g., short writing assignments, longer research papers, team projects, and the like, they can have little understanding of the progress students are making in their ability to use their knowledge. A similar problem arises in evaluating course and teacher effectiveness. End-of-semester evaluations can provide feedback that may help improve instruction in the next semester. Such evaluations do nothing, however, to improve learning opportunities for this semester's students or their teachers.

Several approaches to continuous assessment are possible. At the course level, a series of increasingly complex assignments can help monitor how well students are mastering the subject matter and developing their proficiencies. Inasmuch as acquiring more complex knowledge and higher level proficiencies requires mastery of what necessarily precedes them, this approach makes it easier to spot learning problems as they occur. In addition, several early-semester student evaluation surveys can provide information enabling faculty members to respond more quickly and effectively to student learning problems as they occur; these course evaluation surveys can also identify shortcomings in how faculty present their material and involve students in the learning process. Because continuous improvement and customer focus are so intimately linked, the scope for within-course assessments needs to be expanded to capture not only student satisfaction but also the self-assessment of student gains in proficiencies. This is a difficult but still manageable task.[4]

Conclusions

In a sense, none of what is suggested here is novel, except for linking three key quality improvement elements and refashioning them into a Quality Improvement Instructional Approach. The key is formulating a set of proficiencies that can be used to guide faculty instruction and student learning during the college years. These proficiencies will differ, to a greater or lesser degree, from one discipline to another. To the extent the desired proficiencies are similar across disciplines, and I believe there are considerable similarities, the task of helping students hone these proficiencies will be made easier; in a sense, all courses should reinforce the development of these proficiencies.

What the larger benefits of this approach might be is difficult to assess. In my own case, I can report that using the QI approach has turned the teaching/learning process into a rewarding intellectual challenge for both me and my students — it makes teaching and learning fun rather than drudgery.

The perennial question about costs of implementing a QI approach remains. Faculty members wanting to adapt their teaching approach face the inevitable start-up costs of change. Some will confront ego problems in dealing with student feedback. And so on. Yet, in my experience, the costs of moving toward a QI approach are offset by the energizing effect of the change, by the challenging role one plays as a manager of instructional resources, and by the increased responsibility placed on students for their own learning.

Gaining department-wide support for restructuring the major is no easy task, and it may be premature to try. Much remains to be learned about what proficiencies are needed, what levels of attainment can be achieved, how to determine whether and when students reach these levels, and how best to implement a proficiency-centered QI Instructional Approach. In addition, faculty members must come together to reflect on their goals and philosophies of teaching before they can work together to change the vision of education held by the department and the university. Thus, much remains to be done before this approach can be recommended with full confidence in its beneficial effects.

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[4] For a more extensive discussion of continuous evaluation in the classroom, see Hansen (1993a).

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