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ABSTRACT

This essay considers the interaction between teacher and learner as one which involves providing opportunities for "learning moments," a concept found in the literature on organizational leadership. Learning moments are seen as dynamic events that occur when four complex elements intersect: teacher, learner, environment, and chance. One of the major features of this approach is the disconnection between a teacher's efforts and actual student learning. The model described in this paper proposes a more collaborative effort and encourages viewing teaching as a power ally in, but not directly responsible for, student learning. But this view of learning raises questions about modern approaches to the assessment of teaching and learning in higher education, and it is suggested that rather than focusing on student outcomes, attention should focus on what is done by teachers, students, and institutions within the ambiguous context of learning moments; and that rather than trying to assess when and how learning moments occur, efforts should focus on efforts to assess how well teacher, student, and institution have worked together to create opportunities for learning moments to occur. (Contains 29 references.) (SW)

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Ambiguity and Chance:
An Alternative Perspective on Teaching and Learning

Abstract

The author seeks to introduce a new philosophical approach to discussions of teaching and learning, by considering the interaction between teacher and learner as one which involves the provision of opportunities for "learning moments" to occur. This approach is based on the concept of *decision moments,* found in literature on organizational leadership (Cohen and March, 1986). Learning moments are seen as dynamic events that occur when four complex elements intersect—teacher, learner, environment, and chance. The influence of each of these elements varies from situation to situation, yet a poor showing in any of the four can almost certainly cause difficulties for the achievement of student learning. This view toward learning raises questions about modern approaches to the assessment of teaching and learning in higher education. Rather than focus on "student outcomes", we should focus on what is done by teachers, students and institutions within the ambiguous context of learning moments. This essay argues that rather than trying to assess when and how learning moments occur, and holding teachers, students, and institutions accountable for whether or not they occur, we should focus our efforts on assessing how well the teacher, student, and institution have worked together to *create opportunities for learning moments* to occur.

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held in Albuquerque, New Mexico, November 6-9, 1997. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

INTRODUCTION

In the typical college classroom, the creation of knowledge—or the development of new cognitive awareness—is viewed as either an exchange of fact and theory between teacher and student, or as an act of internal growth, under the guidance of the sage. There are faculty who prefer to transmit the canon to the students—the "empty vessel" perspective of teaching and learning. There are others who insist that, since knowledge can only be constructed from within, the teacher must play the role of "expert guide," or focus his or her efforts toward "shaping" or "growing" the student's cognitive abilities (Fox, 1983). On a further level, many scholars have observed or theorized how the two activities of teaching and learning influence each other. What is offered here is an alternative paradigm—learning as a product of multiple and complex forces surrounded by the ambiguity of chance.

Rather than looking at the activity of learning in traditional ways, we may consider that the *opportunity* for learning occurs at the intersection of three main elements—teacher, learner, and environment. The influence of each of these elements varies from situation to situation, yet a poor showing in any of them can almost certainly cause difficulties for the achievement of student learning in the college classroom. Thus, in assessing the outcomes of classroom activities in higher education institutions, we must look at questions of how well the instructor, student, and institution work together to provide the opportunity for learning.

This essay describes a world in which teachers, learners, and a supportive learning environment tend to be loosely working together to allow for moments of learning to occur. In this view, teaching seems to be less a matter of straightforward instrumental action and control than is anticipated by classical descriptions and approaches to teacher education. In examining the interaction between teacher, student, and environment, the teacher is pictured as having the most influential role, but as having less power over learning than casual observers or participants frequently believe they do. In a world that is difficult to predict and control, this approach recognizes the often overlooked element of chance that exists throughout our daily lives.

One of the major features of this approach is the disconnection between a teacher's efforts and actual student learning. It is widely agreed that learning does take place without a teacher involved. As well, research has shown that students who do not take at least minimal

responsibility for their own learning typically do not learn much, even with the very best of teachers. Experiential learning research has shown that the environment in which teaching and learning activities occur may significantly affect a student's cognitive growth. It is proposed here that modern approaches to learning which do not account for the interaction of all three of these elements—teacher, student and environment—seem incomplete.

However, this approach to teaching does not underestimate the possibilities for teachers to impact student learning. Although it is proposed that a teacher's power is more ambiguous and more circumscribed than many imagine, the teacher is seen as having a significantly powerful role in the classroom learning process. While certainly there are those who may feel that this approach threatens the motivation of teachers by recognizing their limitations, it must be pointed out that the concepts presented in this essay are questioning several currently accepted views toward how teaching occurs, but not the role of teachers themselves.

The act of teaching has often been regarded by educators as isolated, particularly when the classroom door is shut. The model presented in this essay describes a more collaborative effort, and encourages us to see teaching as a powerful ally in, but not directly responsible for, student learning. This approach has significant implications for developing new models of assessment in higher education, in which the student, teacher and institutional environment are all held accountable for improving student learning.

The perspective offered in this discussion is adapted from literature on organizational leadership. In their groundbreaking study, *Leadership and Ambiguity,* Cohen and March (1986) offered a new and vastly different paradigm for viewing the role of leadership in organizational decision making. Their notion of ambiguity in how decisions are made—or rather, how problems, solutions, and participants mix randomly together, while the problems solved depend on a whole host of complex and random activity—lends itself nicely to a discussion on how the creation of knowledge may occur.

AMBIGUITY AND DECISION MAKING

Cohen and March set out to translate a set of observations made in the study of university organizations into a model of decision-making. Institutions of higher education were described as "organized anarchies," in which "decision opportunities are fundamentally ambiguous stimuli"

(Cohen, March & Olsen, 1972). The authors presented a theory of decision-making called "the garbage can process," in which

> . . . problems, solutions, and participants move from one choice opportunity to another in such a way that the nature of the choice, the time it takes, and problems it solves all depend on a relatively complicated intermeshing of the mix of choices available at any one time, the mix of problems that have access to the organization, the mix of solutions looking for problems, and the outside demands on the decision makers.
>
> A major feature of this process is the partial decoupling of problems and choices. Although we think of decision making as a process for solving problems, that is often not what happens. Problems are worked upon in the context of some choice, but choices are made only when the shifting combinations of problems, solutions, and decision makers happen to make action possible (p.90).

From these authors' point of view, "an organization is a collection of choices looking for problems, issues and feelings looking for decision situations in which they might be aired, solutions looking for issues to which they may be the answer, and decision makers looking for work." (p.81) This approach raises doubts about a great deal of conventional thinking around how decisions are made—decisions are not necessarily the direct consequence of action, human or otherwise, but rather the result of multiple forces surrounded by ambiguity. This view toward decision-making is adapted for the discussion on teaching and learning presented throughout this essay.

AMBIGUITY AND TEACHING

In their discussion on ambiguity in decision making, Cohen and March refer to a "flashpoint" or "decision moment" to describe the event where a problem, a solution, and participants come together with a choice opportunity to produce an outcome of some sort. This notion of a "flashpoint" can also be applied to describe a moment where an individual experiences cognitive development—hereafter given the term "learning moment."[1] While it is agreed that a moment of knowledge construction can occur virtually anywhere and anytime, this discussion is concerned primarily with the implications of this perspective in terms of activities within college and university classrooms.

Four elements—teacher, student, environment, and chance—are described as factors which come together to create opportunities for learning moments to occur. A poor showing in any one of these dimensions can seriously inhibit the opportunity for learning moments to occur. Each of

these elements are described briefly, followed by a visual representation of how they interact to provide opportunities for learning.

- *Dimensions of a Teacher's Contribution to Learning Moments*

Traditional approaches to the assessment and improvement of teaching tend to view learning in the context of what the teacher does or should do in the classroom. While there is little argument on the notion that classroom teachers can play a considerably influential role in what and how a student learns, this essay takes the view that this role is less under the teacher's control than classical views toward learning account for.

Certainly, there are many dimensions in which a teacher can contribute to an opportunity for a learning moment to occur. To begin with, it is widely accepted that personal characteristics of teachers play an important role in teaching effectiveness (Sherman & Blackburn, 1975). The combination of teacher preparation, attitudes, behavior, and teaching method are integral to the success of a teacher's work with students. Gender and racial or ethnic diversity may play a role in how the teacher relates to his or her students, and vice versa. Behaviors such as making eye contact, moving about the classroom, and projecting one's voice effectively are all useful when lecturing. A university teacher's attitude toward instruction is important in their classroom interactions with students, as is their philosophy of teaching—particularly, whether knowledge is seen as something transmitted from teacher to student, or constructed from within the student as individual moments of discovery.

Institutional reward structures may influence how a faculty member approaches their teaching responsibilities. The curriculum profoundly impacts the teacher's contribution to the opportunity for learning moment to occur. And without question, an instructor's choice of teaching method has considerable impact on most any classroom learning experiences, particular in terms of how comfortable the instructor is with their choice of method.

Classroom teaching is perhaps the most difficult and complex activity within the academic profession. We use overheads to create the illusion of organization, when we know well that the material we aim to transmit is usually organized arbitrarily, sometimes even haphazardly, based on the personal preferences of the instructor. We try to present things rationally, all the while trying to ignore the influences of an increasingly irrational world. Events in our daily lives do not happen in rational ways, although most history textbooks would have us believe otherwise. While the notion of rationality is itself a subject of debate in many circles, traditional approaches

to teaching are heavily reliant on structure and some form or "rational" or "logical" course and lecture design, as well as widely-used methodologies.

For the purpose of this essay, teaching methods are defined as the collection of accepted routines college professors rely on in the classroom. Routines can reflect the type of instruction preferred by the teacher, whether it be lecture, group discussions, laboratory assignments, or so forth. There are a limited number of these methodological routines, many of which have struggled to gain legitimacy within the academic profession. There are some methods which, based largely on ideological grounds, a number of academics hold strong criticism for, such as the extensive use of drama and humor in the classroom.

While a professor's use of time in the classroom is considered throughout the academic profession as under the full authority of the instructor, there are several classroom-related routines which affect learning activities, routines which are most often out of the instructor's control. Courses usually meet a certain number of hours each week, at the same time and on the same day of the week, in the same classroom, and so forth. As well, routines include how a professor begins and ends class periods. The use of these and other routines may be necessary in order to make ambiguity in teaching and learning understandable and manageable.

The notion of ambiguity surely does not sit well with traditional views toward causes and effects. Indeed, a great many teachers approach their profession with the purpose of directly impacting student learning. Bowen (1980) describes one dimension of learning as "bringing about desired change in the cognitive and affective traits and characteristics of human beings (education)." Looking at teaching as but one of several complementary elements that *may* lead to learning is likely to be a perspective undesired by many in the teaching profession. But there is an additional, related dimension to this approach, in that it accounts for "role-switching"—that is, when the teacher becomes the learner, and the student becomes the teacher. No honest teacher can ever claim to have never learned something from his or her students at some point in their career. In a sense, the teacher is seen more as a role than an individual. Indeed, the role of "teacher" can be played by a book, a television program, a grandparent, a friend, or even a natural event as simple as a leaf falling gently to the ground. Practically every waking moment offers the potential for a learning moment to occur. By viewing teaching in this context, one can

see that the role of teacher is but one of many roles that are at play when learning moments occur.

- *Dimensions of a Student's Contribution to Learning Moments*

There are many ways in which a student contributes to his or her own learning. For example, the learner's prior knowledge plays a critical role in comprehension and knowledge acquisition (Anderson, 1985; Gagne, 1985, McKeachie, Pintrich, Lin and Smith, 1986; Schallert, 1991). A student's prior knowledge in the subject exerts a great influence on what the student will learn from new material. In other words, what the student knows before the class begins provides the platform upon which a teacher can help the student build a more complex understanding of the material. As well, a student's construction of what Perry (1985) calls "personal meaning." is integral to knowledge acquisition, although having a course topic "make sense" to a student involves a complex cognitive negotiation between both teacher and student.

According to Astin (1984), students do better academically if they are involved in campus activities. Motivation and interest in the subject matter are additional dimensions of a student's contribution to a learning moment. Extrinsic motivation—the economic or status rewards for achieving a higher degree—may influence markedly different approaches to learning than intrinsic motivation. According to Pintrich and Garcia (1991), students who are encouraged to set goals and are given license to regulate their own attainment of those goals tend to focus more of their attention and energy on their learning.

Other factors influence a student's contribution to learning moments, including physical and mental condition. Is the student hungry? Tired? Hyperactive? Decades of research have confirmed that socioeconomic class effects learning in various ways throughout the world, as reflected by parental support and pre-college preparation. Gender and racial or ethnic diversity may also play a role in how the student responds to the teacher.

Yet another important dimension is a student's personal learning style. Although teachers may not agree on how to most effectively determine a student's learning style, a comprehensive literature exists on the uses of learning style information for diagnosing students and designing instructional environments (Grasha, 1990). Some students will learn if they are given the opportunity to take risks and discover on their own, but they also need constant support from the

teacher (Moore, 1994). Some students may need concrete examples from audiovisual presentations, whereas others may benefit more from reading a good textbook (Carskadon, 1994). How a student best learns is, for the most part, individually dependent on a wide range of variables specific to that student. Undoubtedly, students who take responsibility for their learning will fare better than their colleagues who do not. However, as mentioned previously, taking an active role in one's learning may not necessarily result in the opportunity for learning moments to occur. A teacher of some form or another is needed, as well as an environment conducive to learning.

- *Environmental Contributions to Learning Moments*

Certainly, the construction of knowledge is an event which does not take place in a contextual vacuum. There are many visible and invisible elements of one's physical environment which are important for creating opportunities for a learning moment to occur. Visible elements include the size and layout of the classroom, reading and homework assignments, exams, chairs, blackboard, pens, door, clock, and so forth. The kinds of resources upon which students and their teachers can rely surely has a considerable impact on their teaching and learning experiences. Step inside a poor urban school, where the facilities have not been maintained. You may find filthy walls, overcrowded classes, holes in the window, a clock or lights that do not function, or perhaps a complete lack of teaching tools such as a blackboard, overhead projector, map, encyclopedia, or computer. Now compare this with a typical private school, with its clean cut lawns, state-of-the-art technology, swept hallways and shiny gym, and one begins to see how the quality of a school's facilities may impact the creation of opportunities for learning moments to occur.

According to McKeachie (1990), the question of whether small classes are more effective than large classes was probably the first major question that research on college teaching tried to answer. Among the first investigators of class size were Edmondson and Mulder (1924), whose comparison of students in two classes (one large, the other small) found relatively equal performance on learning assessments, although students reported a preference for small classes. Further studies–such as Macomber and Siegel's (1957, 1960) experiments at Miami University–determined that the effect of class size on learning depends on what the teacher does in that classroom. Glass and Smith's (1979) meta-analysis of class size research, which takes into

account more basic outcomes of retention, problem solving, and attitude differentiation as criteria for learning, shows that small classes are indeed more favorable.

As described earlier, a classroom is simply one of any number of environments in which learning moments can occur. Research on experiential learning demonstrates how field trips can provide new and inventive ways for students to get more involved in their learning process (Howe, 1993). While this essay is concerned primarily with classroom activities, the element of physical surroundings can affect learning in any setting.

Invisible elements of a physical environment include temperature or climate of the immediate surroundings, air quality, time of day or evening, day of the week or weekend, and so forth. As well, the existence of trust between student and teacher—and among students themselves—can greatly enhance, or disrupt, learning in any classroom setting. While individuals in a classroom can work together to develop trust, the "air of trust" that develops becomes an invisible part of their learning environment. As observed earlier, the curriculum frames the environment for learning, and thus profoundly impacts the opportunity for learning moments to occur. The opportunity for learning moments to occur may also be significantly impacted by institutional issues of ethnicity and multiculturalism on campus, including student body, faculty, and curriculum.

Overall, environmental factors impact opportunities for learning moments to occur along many dimensions. As we often accept the principle that we cannot always have control over our surroundings, this theory accounts for a learning environment separately from either teacher or student influences in the model of how learning moments occur.

- *The Element of Chance*

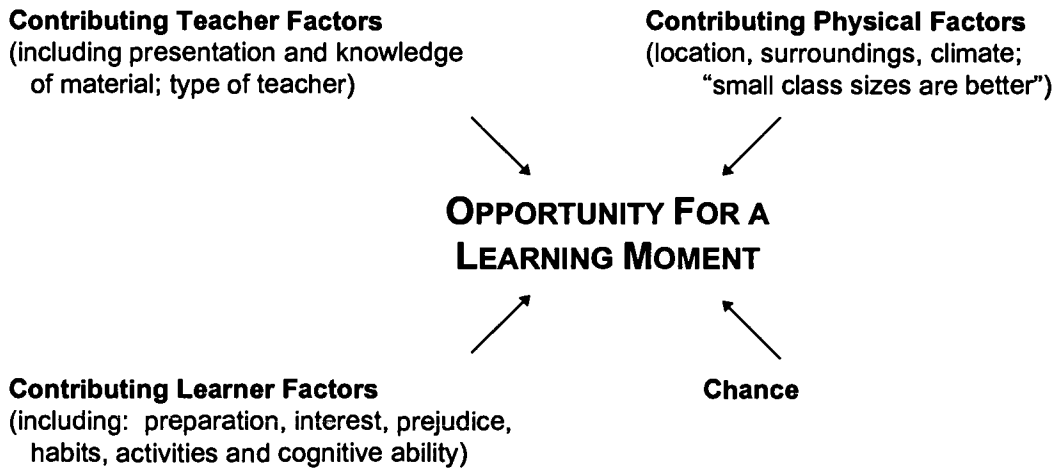
A fourth element—the element of *chance*—appears to be involved to some degree in the "flashpoint" that represents the occurrence of a learning moment in the classroom. Chance is more than having the right timing. Chance is the main product of ambiguity, a primary component of the unknown future. There is never a certainty that optimum teacher, learner, and environment combinations will result in a learning moment. We may try with all our might to create the opportunity for a learning moment to occur, but there is an element of real life that is

forever beyond our control. The phenomenon of a learning moment is thus not entirely a product of teacher, student, and environment.

- *Learning Moments Summarized: A Visual Representation*

As Figure 1 illustrates, learning moments are thus seen as dynamic events that may occur when four complex elements intersect—teacher, learner, environment, and chance.

Figure 1: Diagram of a Learning Moment



Just as the ambiguity of the garbage can process "does not do a particularly good job of resolving problems" (Cohen and March, 1990, p.91), neither does the idea of learning moments, occurring with almost random frequency, present a particularly good view of how to improve student learning. However, learning moments do indeed occur, as many faculty and students will affirm. How, then, to assess—and then improve—the provision of opportunities for learning moments to occur becomes the most important question.

IMPLICATIONS FOR ASSESSMENT POLICIES IN HIGHER EDUCATION

Ernest Boyer calls for redefining the term *scholarship* to incorporate the importance of effective teaching and college classroom interaction. However, the term *effective teaching* has yet to find a common definition in many academic circles. Indeed, anyone who carries out research on teaching effectiveness quickly runs into the problem of evaluating the outcomes of teaching (McKeachie, 1990). Just how do classroom activities affect learning outcomes? While we have many theories, research studies, and assumptions, the truth is that we really don't have the kind of answer to this question that would enable us as teachers or administrators to gear our learning environments, prepare our teachers, or work with students to ensure that learning moments will take place with absolute certainty. Further, assessing when and how learning moments take place is a complex topic for a different conversation altogether.

Society is demanding greater accountability from faculty members and institutions at a time when higher education no longer enjoys the precipitous growth of past decades. The move toward greater accountability has contributed to increased scholarly attention to performance assessment at both the institutional and individual levels. Policymakers throughout the higher education landscape are paying closer attention to the assessment and improvement of classroom activities, largely in response to public concerns over skyrocketing costs and corporate complaints of underprepared graduates of higher education institutions. Buzzwords like 'accountability' and 'benchmarks' have become commonplace in legislative subcommittees on higher education. For example, a recent task force on performance measurement in the Massachusetts public higher education system determined that a defined set of parameters would be used to measure the performance of an institution in terms of its established goals and objectives. Around the globe, faculty are feeling increasing pressure to justify what they spend their time doing in and outside the classroom, under the guise of a public concern that students be better equipped to handle the challenges of modern society.

Is it reasonable for elected politicians or state higher education boards to mandate performance measures for an activity that really cannot be controlled? When faced with things as complex as how students learn, we opt for more easily measurable indicators of productivity, such as how many bodies are in that teacher's classroom, and how those bodies respond to items on a teaching evaluation form. Presented with the difficulty of quantifying the long term impact

of a teacher on a student, several researchers have made assumptions about the maximum number of students a professor can effectively instruct, and then treated faculty/student ratios as indicators of the quality of education (Stuart and Whetten, 1985). As scholars have observed, a "faculty/student ratio" provides fairly unimportant information in terms of assessing the quality of one's teaching or student learning (Forest, 1995). As well, the effective improvement of undergraduate education does not come from mandated teaching loads or assessment plans (NCTLA, 1995).

In terms of assessing teaching effectiveness, however, our reliance on student evaluations is profound. Students react differently to the same teacher, and yet the majority of current teaching assessment methods throughout the world rely on student evaluations (Boyer, Altbach and Whitelaw, 1994). McKeachie (1990) observed that "despite faculty doubts about the ability of students to appreciate good teaching, the research evidence indicates that students are generally good judges–surprisingly so, in view of the fact that most research on student evaluation has been carried out in introductory classes, in which one would expect the students to be less able to evaluate them than in more advanced classes." However, evaluation instruments tend to favor teachers adept in observable or measurable teaching behaviors, while teachers who stress abstract or divergent thinking often do not fare well on such evaluations. These and other issues often confound the usefulness of current methods of assessment in effective teaching.

Most current teaching evaluations, while addressing the underlying need to assess the effectiveness of student learning, look exclusively at the teacher's actions in and out of the classroom. Instruments such as student evaluations, peer observations, and external evaluations are used for collecting information on the role of the faculty in achieving what some refer to as "student outcomes," reflecting our traditional notions of learning within the cause and effect paradigm. These methods for the assessment and improvement of student learning are woefully inadequate for addressing the real complexities involved in the provision of opportunity for learning moments, and are rooted in faulty assumptions of the teaching-learning interaction and of how knowledge is constructed.

Using the theory of teaching and ambiguity presented in this essay to frame a discussion on the assessment of teaching, a new set of questions emerge: how do we collectively assess the contributions of the learner, the teacher, and the institutional environment within the context of

creating opportunities for learning moments? *Rather than trying to assess learning moments, and holding teachers, students, and institutions accountable for whether or not they occur, we should focus our efforts on assessing how well the teacher, student, and institution have created opportunities for learning moments to occur.* Perhaps what is needed is more of a collaborative feedback process, where students, teachers, and peers evaluate student contribution, teacher contribution, and institutional contribution. This approach reflects a belief that the teacher, student, and institution all share equal responsibility for providing opportunities for learning moments to occur.

ASSESSMENT AND SHARED RESPONSIBILITY IN THE CONTEXT OF LEARNING MOMENTS

Rather than looking exclusively at what the faculty member does in his or her classroom to promote learning, it may be argued that we must look at all the variables that need be optimized for "learning moments" to occur. Questions should address *how well the instructor, student, and institution worked together to provide the opportunity for learning moments to occur.* In assessing the effectiveness of student learning—particularly as it relates to teaching activities—we should incorporate an evaluation of the individual classroom facilities for teaching, as well as the level of student involvement and commitment, in addition to the teacher's actions. This notion of shared responsibility for student learning is not new, but has yet to be incorporated into the broader policy discussions on the evaluation of college teaching and learning.

The kind of higher education called for here is one in which teachers and institutions adapt to students' needs, abilities and interests, and students change as a result of the choices they make in navigating environments fostered and supported by the institutions (Tierney & Rhoads, 1992). Faculty should be held accountable for doing the things that facilitate student learning and development, wherever those things occur—in the classroom, during office hours, or even on a field trip. We know from a great deal of research on the topic that clear, well-organized teaching does lead to greater opportunities for learning moments to occur. As this essay observes, there are many other dimensions of a teacher's contribution to learning moments.

Institutions must also be held accountable for providing quality learning environments and resources that support opportunities for learning moments to occur. A growing body of research on this subject provides valuable insights and suggestions for "fostering a therapeutic learning

environment." (NCTLA, 1995, p.16) An institution's responsibilities range from curricular cohesion and targeted student advising programs to providing students with a well-equipped library, campus security, and work-study programs. Perhaps measures for assessing faculty classroom instructional activities should take into account the quality of resources with which the teacher has available to them. Surely, institutions which cannot provide adequate support for learning opportunities should not evaluate their faculty along the same measurement lines used by more affluent institutions.

Students must be held accountable for their role in providing opportunities for learning moments to occur. Rather than relying on exam papers and scores to determine the level of student effort, we must find new ways to examine what, how, and how much a student contributed towards the creation of opportunities for learning moments. Some course evaluation forms request a self-evaluation by students as to their time spent on studying for the course, as well as related questions regarding their commitment to achieving in the course. These can be incorporated into an expanded assessment instrument which includes questions related to other dimensions of a student's contribution to learning moments. Did the student have an attitude towards learning that was conducive to the provision of learning moments? Did the student actively pursue information which would build upon their prior knowledge? This approach moves beyond simply encouraging students to take responsibility for their own learning, and suggests that we formally evaluate the student role in creating opportunities for learning moments to occur, in conjunction with our assessment of both teacher and institutional efforts.

What is suggested here is an approach to assessment in higher education that is framed in the context of how well the teacher, student, and environment worked together to provide opportunities for learning moments to occur. Certainly, many institutions already collect these kinds of information separately. That is, most institutions have some sense of the quality of their physical plan, resources for teaching, and other environmental factors. A teacher's efforts in creating opportunities for learning moments are often assessed using student evaluation, peer or departmental evaluation, and in some cases, by the exam scores achieved by their students. Also, exam scores are often seen more as a reflection of student efforts than a teacher's effectiveness.

Perhaps it would be more useful for all concerned if we were to look at these elements collectively, within the context of learning moments. There are some potential models that can be

adapted to this approach. Certainly, the portfolio is one instrument which can assess the learner's contribution, the teacher's contribution, and the institution's contribution to the provision of learning moments. In this kind of collaborative assessment, the student and teacher both assume some level of responsibility in the final product. The intellectual processes and work activities of both teacher and student should be considered as important in assessment as the outcomes. Shared assessments of the students work, the teacher's efforts, and the environment in which the activities took place can lead to a more complete assessment of the contributions made by each of these factors.

What is needed is a collegial model of assessment, involving critical judgments, feedback from colleagues and administrators, open discourse, collaborative improvement activities, and debate. Assessment activities can also inform a teacher's approach to their classrooms, and thus positively impact their ability to create opportunities for learning moments to occur. One of the most useful approaches developed this decade involves a form of assessment that is teacher-owned and operated rather than associated with standardized tests and legislative intervention (Angelo and Cross, 1993). Angelo and Cross suggest a process of classroom assessment that involves close observation of students in the process of learning and the collection of frequent feedback on students' learning. In the context of providing opportunities for learning moments to occur, we can see classroom assessment as likely to be beneficial to both teachers and students because it revolves around questions of immediate interest to them (rather than questions of outside researchers), uses accessible methods to collect data, and generates results that have clear implications for action and are thus likely to produce change.

Portfolios and classroom assessment are by no means the perfect answer to the complex questions raised by the notion of learning moments presented in this essay. Rather, they are seen as useful beginnings for a larger discussion on how assessment can and should evolve to a more encompassing perspective of teacher, student and institution. Above all, assessment is seen here as most useful only when it informs current and future higher education policies and activities. The most pressing concern in all this is how to maximize the contributions of student, teacher, and environment, in ways that most frequently create the greatest opportunities for learning moments to occur. Determining how to go about this logistically is beyond the scope of this initial exploration, but is a necessary "next step" in the development of this perspective. Future

research and analysis on issues of assessment in each of these areas—teacher, student, and environment—is needed to help delineate the complexities involved, as well as for developing new approaches to creating opportunities for learning moments to occur.

CONCLUSION

Classroom teaching is perhaps the most difficult and complex activity within the academic profession. While a college teacher strives to encourage students to learn the material, to learn to think critically and analytically, and to create knowledge for themselves, the results of their labor are often ambiguous and hard to pin down. Learning is inherently an individual achievement—no two individuals in an classroom have identical views toward the material or identical preparation, or achieve identical 'outcomes', or even learn at the same pace. Thus, for a learning moment to be possible, each individual must be presented with the right mix of teacher, learner preparation, environment, and chance. In a sense, the higher education enterprise should focus our collective efforts not on teaching, but on providing opportunities for learning moments to occur.

However, current research on the assessment of teaching in postseondary education reflects a common belief that learning is primarily a direct consequence of teacher activity within a classroom. While many present methods of assessing teaching and student learning give fair indication of the effectiveness of a college teacher's efforts, there are many students who are quite capable of learning despite incredibly lousy teachers. Student developmentalists around the globe have pointed to factors far beyond the control of the college teacher which affect student learning. Therefore, while assessment of student learning may inform efforts to improve college teaching, they cannot be perceived as the only, or even main variable in the relationship.

The evaluation of teaching is very difficult because teaching is about process not products. Although there are a number of ways to argue and assess certain teaching outcomes, the heart and soul of teaching is the synthesis of the intellectual work that goes into preparation, the myriad choices of methodology and content, and then the dynamic process that unfolds as teacher and students together engage the course's content and methods. That process is "dynamic" because it is never the same twice, and it always requires a running negotiation between structure and improvisation.

The purpose of this essay has been to introduce and explain this new perspective, and to address several questions which this perspective raises. The process of learning is seen here as dynamic and interactive, involving several dimensions of teacher and learner personalities, preparation, skills and aptitudes, as well as physical and social environment. Rather than looking at the activity of learning in traditional ways, we may consider that the *opportunity* for learning

occurs at the intersection of four main elements—teacher, learner, environment, and chance. The influence of each of these elements varies from situation to situation, yet a poor showing in any of them can almost certainly cause difficulties for the achievement of student learning in the college classroom. Obviously, the fourth element, chance, is well beyond our control. However, there are many strange and wondrous things in our lives which we may never understand—the ambiguity of chance is but one of them. The existence of chance implies that we as teachers do not have full control over the learning process. While this is a concept which many teachers may find disagreeable, it is nonetheless difficult to disprove.

College teachers are merely humans, plugging away through life as best we can, struggling to make sense and meaning of an increasingly complex and incomprehensible world. The creation of knowledge—or the development of new cognitive awareness—has been traditionally viewed as either an exchange of fact and theory between teacher and student, or as an act of internal growth or individual discovery, under the guidance of the sage. This essay proposes a different way of looking at the effectiveness of higher education institutions. Rather than trying to assess when and how learning moments occur, and holding teachers, students, and institutions accountable for whether or not they occur, we should focus our efforts on assessing how well the teacher, student, and institution have worked together to *create opportunities for learning moments* to occur. While it is true that the actions of a teacher can influence the potential for learning, this theory argues that the level of this influence is minimal at best. Under the framework outlined herein, the best we can do is in an ambiguous situation is identify and create the most opportunities for learning moments to occur.

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[1] The notion of **learning moments** as applied in this discussion is not to be confused with related research on the "critical moment in learning" (Palmer, 1993) or with other uses of the term "learning moments" (Bowen, 1980).

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