

THE FORGOTTEN DIMENSIONS OF TEACHING?

by

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In discussions of technological innovations in education, basic and time-honored aspects of teaching are too often omitted. Analyses are at times regrettably narrow in scope, unsatisfactory in their neglect to integrate the old with the new. The purpose of this paper is to reflect upon certain rudiments of teaching with specific reference to the role of the teacher and to affective aspects of education. To say it all at once: in discussing innovation one must be heedful of basics. Technological advances can, of course, facilitate learning, but technology in education, as is the case in other areas as well, must not be an end in itself, but rather a means toward an end. In education, technology should enhance teaching; never must it be a substitute for it. With technology advancing at a sometimes breathtaking tempo, there is all the more reason for teachers to ask themselves how, specifically, technology contributes to the learning process. One must be mindful of the potential pitfalls of technology utilization. And no serious educator would wish to convey the impression, however subliminal, that somehow he/she is being replaced with a machine. Thus should we regard the employment of new educational technologies and what Graham Greene so aptly referred to as the "human factor" as different sides of the same coin.

Learning involves a variety of teaching approaches, the most effective of which entail two-way, spoken

communication between the teacher and the students, and equally importantly, among the students themselves (Hyman, 1980, p. 1). Salient examples include recitation, dialogue, guided discussions and role-playing. L. M. and J. R. Gibb hypothesize that students taught by the "participative action" method were significantly superior to students taught by more traditional lecture methods in both self-insight and role flexibility (Gibb and Gibb, 1951, p. 247). They also provide support for the assumption that group-centered teaching facilitates development of group membership skills (McKeachie, 1986, p. 49). "Gee-wizz" technology in the classroom is a poor substitute even for lectures, where, as most experts would agree, far less learning takes place (Gullette, 1982, pp. 38-30; Hill, 1977, pp. 49-51).

Roles of Teachers

In their research on college teaching, Solomon Cytrynbaum and Richard Mann have categorized teacher roles as follows (McKeachie, 1986, p. 53; Mann, 1970, pp. 85-87).

1. The teacher as person.
2. The teacher as facilitator
3. The teacher as socializing agent.
4. The teacher as formal authority.
5. The teacher as ego ideal.
6. The teacher as expert.

Citing these categories, Wilbert McKeachie describes each in turn. Teachers as persons, he argues, are not only addressing their own needs to recognize the self they are portraying (McKeachie, 1986, p. 64-65). They are also performing the vital task of puncturing the various mythical constructions which students may develop.

The net effect of this is both to decrease the awe in which they are often held and to increase the extent to which their interests reveal them to be ordinary mortals in pursuit of realistic and manageable educational goals.

What does this mean from the standpoint of technological innovation? Much the same thing. Just as teachers must puncture various and sundry myths about themselves, so must they assist students in overcoming uncertainties and reservations about technology. With respect to the "human factor," educators must discourage students from being overawed by technology, while at the same time showing them how technological innovation can ease and advance the learning process. I think, for example, of my unflinching encouragement in years past of the use of personal computers to develop writing skills. No one in this day and age should be processing words the old-fashioned way, i.e., writing papers in long hand, then typing them.

The teacher as facilitator tends to respond to the student's own definition of his/her goals. These goals may be quite divergent from those of the teacher, but then for one person to facilitate the learning and development of another often involves a recognition of the substantial differences between individuals in terms of what they value and what they are seeking (McKeachie, 1986, pp. 59-60). If we capture the pedagogical fervor often distinguishing some teachers who strongly emphasize the facilitator functions, we note the teacher's frequent rejection of an effort even to impose questions upon students who need to develop questions and answers that are somehow relevant to their own lives (McKeachie, 1986, p. 60). That facet of the

students which connects with the teacher as facilitator might be categorized as one whose personal agenda includes not only finding out more about the course material but also finding out more about themselves (McKeachie, 1986, pp. 60-61). "What am I good at?" "Where do my interests lie?" "What are my ideas about a particular body of knowledge?" Student performance in the classroom is partly expressive, driven by the need to articulate new ideas and to develop some sense of ownership vis-a-vis borrowed knowledge (Banes-McConnell, 1978, pp. 78-82). The key motifs within this aspect of teaching and learning are creativity and independence. Students, for their part, should be offered the opportunity to be creative, as opposed to being restricted within the teacher's definition of what is appropriate.

So let us ask ourselves at this point: do we provide students with adequate opportunity to articulate new ideas, to be creative? Unfortunately, not often enough. What bearing does this have upon technological innovation? The short answer is: much the same as this does for the "teacher as person." Just as teachers as persons should convey to others how they sustain their interests in many matters, so the teacher as facilitator should demonstrate to students how technology can assist in their personal growth, how technology can contribute to their articulation of new ideas, and how technology can better develop their sense of ownership of old ideas. Technology in the classroom should aid students on their path to functioning creatively and independently. Accordingly, we should continuously ask ourselves: how specifically is the technology we are employing doing this? Is it doing it at all? If we find ourselves at a loss for answers on

this score, a reappraisal might be in order.

As Ronald Hyman, Philip McKnight and others point out, the classroom teacher as a socializing agent can be understood only if one first realizes two things about the context in which education takes place (Hyman, 1980, p. 2; McKnight, 1978, pp. 15-16). First, teachers are not only in possession of certain intellectual materials; they are also members of various overlapping collectives with respect to which students are either outsiders or marginal members. Second, the goals toward which students are striving typically extend far beyond the particular classroom and the particular course. Teachers are members of a community of scholars as accredited by a particular professional discipline, and as well, as is the case with Embry-Riddle Aeronautical University, members of an institution that is prominently relevant to the aspirations of students. Teachers and students are bound together in various ways within the socialization process (McKeachie, 1986, pp. 57-59).

What lessons present themselves here for technological innovation? The answers should be fairly obvious since this is probably the most important aspect of the teaching role with respect to technology. Here courses and teachers can stand or fall. Through various pedagogical approaches and through classroom technology, students should have the opportunity to be expressive and creative, to feel part of a specialized learning environment. They should be focusing on longer-term goals. They should feel comfortable with technology: if they do not, something is very wrong. A student who is lost in class or who feels overwhelmed by classroom technology will invariably be adrift outside the classroom. Technology should promote a perception on

the students' part of membership, of being integrated into the learning collective.

But technology, of course, is a two-edged sword. Technological innovation can, in extreme cases, marginalize, even alienate students. If the teacher fails to demonstrate the relevance of a particular presentation, if technology obfuscates rather than complements, when classroom technology becomes an end in itself, or when the teachers themselves are not sufficiently conversant with technological innovation, then students in all likelihood will become outsiders. The learning process will not get off the ground and the teacher will be in no position to convey how his/her knowledge is relevant to the student's own interests and goals.

As McKeachie so persuasively argues, viewed from the perspective of the larger social structure of which the classroom is part, the teacher is an agent not only of instruction but of control and evaluation (McKeachie, 1986, pp. 55-56). Assignments, due dates and criteria of acceptability are all matters of concern. Pressures upon the teacher to perform the traditional functions of formal authority derive from many sources. Future employers, professional schools and university administration all insist upon purposeful and comparable standards by which to evaluate student performance. If classroom technology impinges upon the role of the teacher as a formal authority, by, for example, significantly undermining the teacher's credibility or preventing the teacher from furnishing meaningful estimates of student performance, then serious problems may present themselves. Certainly there is nothing wrong per se with a teacher being a pleasant and nice person, but at the same time the teacher must be wary of

actions that could repudiate his/her inherent prerogative and authority in the classroom or to employ technology with an aim to being "objective" and thus to shun responsibility to facilitate and to manage.

A teacher might well assume an essentially "heroic" or charismatic role in the classroom and in so doing could serve in the capacity of "ego ideal" for the student (Hart and Driver, 1978, pp. 198-200). This notion is not as curious as it might initially sound. Haven't we all at some time or another found ourselves imitating in manner or in speech those we have emulated? Imitation is often the sincerest form of flattery. Haven't we as teachers encountered students attempting to replicate our teaching styles? Some teachers serve as an "ego ideal" by demonstrating their expertise, others through their infectious enthusiasm for the subject matter, yet others by their ability to render what would appear abstract to be worthwhile and germane (McKeachie, 1986, pp. 61-62). But just as a teacher's ego can be on the line in a particularly challenging course or before a somewhat difficult group, so can the student's. Students who feel intimidated by technology, overwhelmed by figures and charts, dismayed by computer programs with which they are not conversant are simply unlikely to learn. Telltale symptoms: lack of interest in the material, eyes glazed over. Sophisticated technology in extreme circumstances can result in lethargy and indifference. This facet of teaching cuts both ways as well. Students who are comfortable with new technology and new methods will gain in confidence, acquire a sense of accomplishment and be more receptive to designated standards of evaluation. At the same time, of course, students will be more favorably disposed to innovative teachers.

Teachers are joined with students in the classroom because in some form or another they possess expertise (Gullette, 1982, p. 3; Maier and Solem, 1952, p. 278). The chief goal should be to transmit whatever information, analytical perspectives or critical viewpoints they wish the students to acquire. Relevance to the students stems from the fact that the teacher knows something the students do not yet know. To complete this picture and to realize the pertinence of this role to technological innovation, we need to inquire about the activities of students while the latter are in contact with the teacher as an expert.

What comes to mind are our own experiences of, say, listening to a lecture whose meaning seemed beyond our grasp. We might have felt an acute sense of inadequacy. It might have been in the back of our minds that we might appear foolish in public should our lack of understanding somehow be displayed. We might have simply felt bored.

Students in such a situation seek to avoid what McKeachie terms one of the greatest disasters inherent in the education process--the realization that one is over one's head, that certain information cannot be acquired with a reasonable expenditure of effort (McKeachie, 1986, p. 55). Naturally, this holds doubly true for teachers. A teacher must avoid getting in over his/her head as a result of experimentation with innovative methods or adoption of new classroom technology. To quote an old saw: if one is in a hole, it behooves one to stop digging. More to the point though, teachers who have not satisfactorily integrated the technology they are using, be this audio-visual material, new computer software, or more sophisticated viewgraphs generated by

upgraded software, risk discrediting their roles as experts in the eyes of their students. They demonstrate their inability to employ new technology, and to boot, their handling of the subject matter suffers. Questions may arise in students' minds about the teacher's ability to make critical and creative judgments in the field of supposed expertise. For the teacher the issue of competence involves both the ability to comprehend and organize relevant materials as well as the facility to present this material clearly and convincingly (Kemp, 1980, pp. 34-37) . Should questions ensue on any of these matters, a disconnect between teacher and student is bound to present itself because the teacher is associated with the students first and foremost because of some form of recognized expertise.

The First-Rate Instructor

Lest I dwell unduly on potential teaching pitfalls, let us continue on a more upbeat note. Among the results of continuing research on teaching and learning is that one is able to compile a list of the core attributes that educators generally agree distinguish the most effective instructors (Armed Forces Staff College *Faculty Handbook*, 1992, p. 17). Although this list is not necessarily comprehensive or etched in granite, it should heighten one's awareness of the range of qualities needed for classroom excellence. Parenthetically, one might add that, although achieving perfection in all of them is not humanly possible, this list can serve as a guide for self-assessment, but above all as a beacon for aspiration and goal-setting.

Superior instructors, by and large:

- * exude enthusiasm about their work
- * continually strive to improve their teaching skills

- * are organized and well prepared when they conduct classes
- * present ideas clearly
- * are available to students
- * listen attentively to what students have to say
- * treat diverse viewpoints with respect
- * provide prompt feedback to students
- * give due consideration to feedback on their own performance
- * integrate current subject matter into their course content
- * create a climate conducive to learning

What does this time-honored list have to do with technological innovation in education? Much. Most observers would agree that these are the enduring principles of good instruction. Technological refinement and the pace of change notwithstanding, it is critical that we not overlook the precepts. In all cases, new technologies can and should assist the instructor in becoming more effective. New software programs with graphic display features such as "Harvard Graphics" and "Powerpoint," if used effectively, enable instructors to update their class materials while improving their teaching skills. These should also generate instructor and student enthusiasm. Visual displays allow instructors to present ideas more clearly, to present these in fresh ways and to review material readily and more systematically. New software programs promote better organization and facilitate the integration of new subject matter into the course content. Consider for a moment how far "Microsoft" word processing programs have come in the last years. Software with direct classroom applicability will become increasingly capable and sophisticated. We should anticipate a jump in long-distance learning. The instructor might be 500 miles away, the

presentation delivered by fiber optics or satellite to students, who will be able to ask and answer questions and take tests by interactive television or fax.

Crucial from the standpoint of the instructor, and I have identified these as the two subthemes of this paper, are, first, that instructors stay abreast of technological innovation with classroom application, and, second, that instructors not lose sight of basic pedagogical principles when introducing new technologies into the classroom. In short, instructors must continually ask themselves how certain technological innovation will complement their teaching.

Affective Aspects of Teaching

Let us return here to the human factor, lest we allow technology to overshadow endeavors of a profession requiring personal commitment and an individual touch. Too often, we tend to regard college as primarily, if not exclusively an intellectual or cognitive experience. Such a conception ignores at least two important considerations.

Individual students often bring to college feelings, preconceptions, interests and values that can hinder their learning or understanding of course content. On the other hand, college is about values, at least values like logical thinking, clear expression, appreciating analysis and literature, and esteeming learning. As William Cashin and Philip McKnight have so elegantly phrased it: "At a profound level, college is about what kind of person one aspires to be, what kind of world the student wants, and what life is about" (Cashin and McKnight, 1986, p. 4). This sense in each of us is what contributes to the notion of the *consensus gentium*, the

standard of worth which Aristotle saw as the pivotal test of excellence, the response of numerous individuals over a long period of time (Kirsch, 1978, p. 5).

Our teaching should be value-laden, although this must be content-specific. Let us consider here the example of history as an academic discipline. History, to be savored and understood, is not just about key events in the advancement of mankind through time. It is not merely a collection of dates, and definitely not a showcase highlighting only those occasional bright moments in the otherwise bleak and savage landscape of our past, of this trail of tears that is mankind's existence on this earth. History is about ideals and beliefs, dreams and aspirations. It is the record of those tangible qualities in our being that continually urge us to strive to be the best we can ever dream to be and of the amazing sacrifices made in exceeding our grasp on those rare occasions when we chose to try, even when we did not succeed (*History Book Club Review*, Winter 1995, p. 13.). To study history honestly is also to acknowledge the much longer record of darker moments and deeds. In teaching history, we might ask ourselves, for example, how new technologies might be employed to make these ideals and beliefs, these dreams and aspirations more meaningful to students. How might these be made to "come alive"?

We need therefore to ask ourselves how classroom technologies are suited to these concerns about feelings, interests and values. Cashin offers several maxims about affective aspects of teaching. (Cashin, 1985, p. 8).

1. Know your students. Begin all presentations with something relevant to the students' interests and goals, something out

2. Be accepting rather than judgmental or evaluative. Try to focus on the correct part of a student response. Positive reinforcement will foster more learning than negative reinforcement.

3. Be patient. Discussion classes take more time to get going. The instructor must be careful not to talk too much.

4. Challenge the students, but do not threaten them. One should strive to arouse the students enough to stretch themselves, but not so much that this becomes counterproductive. What makes this particularly difficult is that what challenges one student may distress another.

5. Use personal anecdotes. Using one's own experiences and demonstrating that one is human can facilitate the discussion if done in moderation.

6. Avoid premature agreement. One may wish to ask a student or group to argue against the apparent consensus. Or one may wish to play the devil's advocate--very carefully.

The imaginative instructor might want to deliberate how technology suitable to the classroom might contribute to these affective aspects of teaching. Obviously, few absolute rights or wrongs present themselves, nor are there hard-and-fast answers. Might, for example, visual displays be used to stimulate classroom discussion, which, in turn allows the instructor to better know his/her students? How do visual displays kindle fresh ideas? Do these assist in challenging students? Might these be employed to make personal anecdotes "come alive"? Many possibilities suggest themselves, but instructor creativity makes all the difference.

Effective Computer-Generated Visuals

Having discussed computer-generated

instructional material in several contexts, let us consider some now widely accepted guidelines for the use of visuals in the classroom. (Eble, 1976, pp. 202-203; Armed Forces Staff College *Faculty Handbook*, 1992, pp. 32-38).

Regrettably few instructors have been specifically trained to design visual aids for teaching and many are too hard-pressed for time to develop these skills systematically (Kemp, 1980, pp. 1-4; Tufte, 1990, pp. 9-13). As is usually the case in human endeavors, practice makes perfect and one must experiment with visuals with an aim to determining what is effective and what is not. The purpose here is to identify problems and determine potential hazards with using classroom visual aids. Although most of these guidelines might appear fairly straightforward, with technological capabilities for classroom instruction expanding rapidly, basic guidelines become even more important.

Three chief considerations permit a subdivision of this topic: when to use a computer-generated visual aid, what it should include and how it should appear. To begin with the obvious: one should avoid duplicating something readily available. Little purpose is served in developing a projectable slide of a diagram, chart, or table that is already printed in a text or other handout that students have been issued. Even in these "high-tech" times, one might simply direct students to look at a chart or table in the textbook. One should determine whether there is a real need for an image before going to the trouble of generating visual aids. These should constitute something not readily available to the students in another form. The following criteria of acceptability should apply:

How does this visual aid complement the

presentation?

Is this reminiscent of mere "razzle-dazzle"?

If so, forget it.

How does this visual aid mesh with others being employed?

Are student eyes likely to glaze over as a result of visual overload?

As previously mentioned, one must endeavor to organize and simplify one's material. It is a mistake to select charts, diagrams or graphs uncritically from a publication, even if this is considered a seminal work. As Albert Einstein once pithily remarked: "Life is complicated, simplify, simplify." A teacher of mathematics or physics, for example, must explain relatively complex formulas to students, but only the foolhardy would rely too heavily upon projecting advanced formulas and theorems, most of which appear in texts anyway, upon a classroom screen.

One should use tables only when indispensable. One might ask oneself, first, whether a table or graph is really necessary at all. Sometimes, it is. Students are inclined to view these only fleetingly or to ignore them altogether, regarding these as interruptions or merely evidence for a point the instructor is about to make in the presentation. One might try summarizing the content of a table in a few paragraphs of a discussion or showing it in an appealing visual (*USA Today* often does this well), so it can be grasped at a glance.

Lengthy and complex summaries should be broken down into a series of slides designed to simplify the salient issues for students and to allow them to interject questions. Sorting material in advance proffers the added advantages of making the material more memorable to students, assisting them in digesting the material and

elucidating the material to the instructor. Showing crowded, complex, or densely illustrated graphics to impress students how complicated the subject is or out of sheer negligence is professionally irresponsible.

Visual aids are usually most effective for showing relatively simple interrelationships; chronologies; sequences of events, e.g., flow charts; and the shapes or formats of things, e.g., countries, aircraft, weather patterns (Armed Forces Staff College *Faculty Handbook*, 1992, p. 3) These are instances where straight verbal text is not the most efficient method of communication and may in fact impede rather than promote understanding (Eble, 1976, p. 204). One should avoid generating visuals of long lists or tables, such as those too often derived in detail from computer databases. These should be furnished only in printed curriculum materials. As visuals they numb the minds of student viewers and most are difficult to read.

At times one must carefully distinguish between one's own notes and the words and phrases one shows the students to aid their understanding of a topic. The language of the visual might need to be more complete and better organized than the notes the instructor uses as a prompt for a guided discussion. The most crucial difference is that the instructor presumably already knows the subject, while the students, for their part, might not yet be conversant with it and therefore need to be provided a more explicit structure. The alert student is attempting to understand the structure and relationship underpinning the elements of the particular visual aid (Armed Forces Staff College *Faculty Handbook*, 1992, p. 6). This is no place for ambiguity.

Educational research has demonstrated that it is far easier to

remember a set of related elements than a group of unrelated words and phrases (McKeachie, 1986, pp. 299-301; Kozol, 1985, pp. 148-151). That knowledge underpins the entire notion "mnemonics," that is, techniques for remembering. If the words or phrases on a visual display have so little interconnectedness that viewers would be hard-pressed to grasp the significance even after careful explanation, then they are most unlikely to remember much several days later. Once an instructor has decided to develop a visual of some sort, the amount of material it contains must be restricted to what can be readily handled by the observing eye from the back of the room without straining. The requirement that all letters and characters be legible to students in the back of the room severely limits that amount of text appearing on a computer-generated visual. The particular colors used for lettering should be chosen carefully, since varying light levels affect the visibility and readability of colors differently.

Concluding Remarks

One of the joys of teaching derives from the challenge of being out on one's own, rethinking the unexplored, reflecting upon the realm of human relations and vision. Technology continues to offer new possibilities for such endeavors, but technological innovation in the classroom can only assist in the undertaking. It cannot be a surrogate for imagination and creativity. Working back and forth between experience and ideas, evidence and imagination, data and theory, one can acquire more than time and space tender (Cronin, 1986, p. 2). But in adopting new technologies for learning, one must remain cognizant of several abiding postulates of learning theory (Eble, 1976, pp. 202-205;

Lowman, 1984, pp. 120-22). All are pertinent to the topic of technological innovations in education. How these pertain, of course, is largely a matter of judgment.

1. Learning is an active, continuous process. Purposeful action is better than mere repeated motions.

2. Learners can be motivated in many ways to learn specific things. Conflicting motivations can hinder learning.

3. Learning is affected by the learner's set, that is, a predisposition to react to some stimuli in a particular way.

4. Relearning is much easier than original learning. Recall is different from retention; given the right stimulus, learners can recall more than they commonly suspect.

5. Progress in learning is not uniform, but frequently reaches plateaus where the rate of learning slows appreciably.

6. Transfer of learning has been too uncritically accepted in the past. Success in learning some things may make it easier to learn others. It is possible to learn how to learn.

Teacher's Roles	Major Goals	Characteristic Skills	Sources of Student Motivation
Teacher as person	To convey the full range of human needs and skills relevant to and sustained by one's intellectual activity	Being trustworthy and warm enough to encourage students to be open	The desire to have one's life cohere
Teacher as facilitator	To promote creativity and growth in student's own terms	Sharpening student awareness of their interests and skills; to use insight to help students reach goals	Self-discovery and clarification to grow in desired direction
Teacher as socializing agent	To clarify goals and career paths beyond the course	Clarifying rewards and demands of the academic discipline	Need to clarify one's interest and calling
Teacher as formal authority	To set goals and procedures for reaching goals	Defining structure and criteria of acceptability; evaluating performance	Dependency; being assessed a good grade
Teacher as ego ideal	To convey the excitement and value of intellectual inquiry in a given field of study	Demonstrating the ultimate worthwhileness of, or personal commitment to one's educational goals	The desire for a model; a personification of one's ideals
Teacher as expert	To transmit information, the concepts and perspectives of the field	Listening; scholarly preparation, class organization and presentation	Intellectual curiosity; need for achievement

Source: Wilbert J. McKeachie, (1986) *Teaching Tips A Guidebook for the Beginning College Teacher*. 8th ed., Lexington, Mass: D.C. Heath.

Philosophies of Adult Education

	CLASSICAL LIBERAL ADULT EDUCATION	BEHAVIORALIST ADULT EDUCATION	PROGRESSIVE ADULT EDUCATION	HUMANISTIC ADULT EDUCATION
PURPOSE	To develop literacy in the broadest sense	To promote behavioral change	To transmit culture and societal structure	To enhance personal growth and development
METHODS	Dialectic; lecture; study groups; critical reading and discussion	Programmed instruction; contract learning; computer assisted instruction	Problem-solving; scientific method; inductive method; experimental method	Experiential; group tasks; group discussion; team teaching; discovery method
CONCEPTS	Learning for its own sake; rational, intellectual education; classical humanism	Stimulus-response; behavior modification; competency-based mastery learning; behavioral objectives	Problem-solving; experience-based education; life-long-learning; pragmatic knowledge	Individuality; self-directedness; openness; cooperation; authenticity
LEARNER	"Renaissance person"; cultured; always a learner; seeks knowledge rather than just information; conceptual thinking	Learner takes an active role in learning; practicing new behavior; strong environmental influence	Interests and Experiences key elements in learning; people have unlimited potential to develop through education	Learner is highly motivated and self-directed
TEACHER	The expert transmitter of knowledge; directs learning process	Manager; controller; controls learning outcomes	Guides learning though educative experiences	Facilitator; partner; promotes but does not direct learning

Descriptions are excerpted from J. Elias and S. Merriam (1980), *Philosophical Foundations of Adult Education*, Malabar, FL: Robert F. Krieger Publishing Company. My purpose in providing readers with this overview is to challenge them to consider how new technologies might correspond to various philosophies of education and how technology might enhance certain approaches. I do not mean to submit there are definitive answers, only that one should remain cognizant of philosophical underpinnings when introducing new technology into the classroom. Teachers should regularly ask themselves how technological innovation will promote the learning process.

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