Alfred North Whitehead
on Learning and Education
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on Learning and Education:
Theory and Application

edited by

Franz G. Riffert

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Introduction: Via Negativa – Whitehead’s Critique of Traditional Concepts of Learning and Instruction

Franz Riffert

1. The Contemporary Situation in Education

During the last decades the educational system of the USA has been severely criticized. This criticism was – and still is – based on “state-wide skill-based testing and the poor performance of American students in international comparison” (Dick 1991, 43). According to the Cognition and Technology Group at Vanderbilt (1992, 77) “[o]ne source of concern about the need to teach thinking stems from poor national test scores, especially on tasks involving problem solving and reasoning”. (See also: Schoenfeld 1992; Jones & Idol 1990; Carpenter et al. 1983; NAEP 1983;) Nickerson (1988) summarized his analysis of the test results by maintaining: “In the aggregate, the findings from these studies force the conclusion that it is possible to finish 12 or 13 years of education in the United States without developing much competence as a thinker” (1988, 5; see also CTG 1991, 34). More or less the same situation is revealed by the international performance tests in many European nations. Especially in Germany ‘educational shock’ was widespread after the results of the PISA 2000 study were published about three years ago.

There have been calls for fundamental reform of the educational system in many places. But where to go? Simply being shocked by national and international test results does not lead to a better educational system. A first step, certainly, is an analysis of possible explanations of the bad results. Human cultures and their social subsystems are very complex, and so are the educational systems, the school cultures, and even the multifaceted processes going on between a teacher and say 20 to 30 students in one single class of 50 minutes. Problem analysis is difficult – certainly – but it is not impossible. No detailed
analysis can be given here; but there is one aspect which is frequently thought to be crucial: “[A] major cause of poor performance on tasks that require the generation of relevant sub-problems, arguments, and explanations is that most curricula emphasize the memorization of facts and the acquisition of relatively isolated sub-skills that are learned out of context and hence result in knowledge representations that tend to remain inert (e.g., see Brown, Collins & Duguid 1989; Cognition and Technology Group at Vanderbilt, 1990; Resnick & Klopfer 1989).” (Cognition and Technology Group 1992, 78)

According to Jerome Bruner it should be just the other way round: “A method of instruction should have the objective of leading the child to discover for [her]himself. Telling children and then testing them on what they have been told inevitably has the effect of producing bench-bound learners whose motivation for learning is likely to be extrinsic to the task – pleasing the teacher, getting into the College, artificially maintaining self-esteem. The virtues of encouraging discovery are of two kinds. In the first place, the child will make what [s]he learns [her] his own, will fit his discovery into the interior world of cultures that [s]he creates for [her]himself. Equally important, discovery and the sense of confidence which it provides is the proper reward for learning” (Bruner 1971, 123f).

But we may ask further: Why do we teach isolated context-free contents? One among many answers directs attention to the curriculum. Curricula encouraging, if not forcing, teachers to present isolated scraps of knowledge are based on associationist-behaviorist assumptions. These assumptions themselves rest on a mechanist-substantialist neo-positivist epistemology and its, often only implicit, metaphysics: “There is no question that the major principles of instructional design have been derived from Skinnerian psychology and Gagne’s conditions of learning [1965]. These theories have been integrated, along with other principles, into systematic models for designing instruction.” (Dick 1991, 41) According to this line of argumentation instructional manuals which rest on neo-positivist/behaviorist assumptions lead to inert knowledge.

The term ‘inert knowledge’ was coined by Alfred North Whitehead (see for instance 1967, 32) when describing the failure of the school system of his day, i.e., the beginning of the twentieth century. The term was taken up by the Cognition and Technology Group at Vanderbilt decades later and since then appears frequently in the discussion
between traditionalist and constructivist educators. It was one of Whitehead’s major intentions to provide teachers and school authorities with an outline of an educational concept, based on a new learning theory, which avoids the production of inert knowledge. This alternative learning theory and educational theory is based on an alternative epistemology and even metaphysics. Only with this fundamental shift can we hope to found educational reform on a better basis. Alfred North Whitehead has offered a philosophical alternative to the mechanistic, neo-positivist view on which behaviorism was founded.

### 2. Whitehead’s Critique of Traditional Views on Learning and Education

In this book a number of scholars undertake adventurous expeditions into Whitehead’s theory of learning and teaching. Whitehead is known less for his educational ideas than for his work in the fields of formal logic, mathematical physics and metaphysics. Nevertheless, he also developed creative ideas on such topics as learning and teaching on the basis of his challenging process metaphysics. In his days, and even today, these ideas have to be termed bold. They leave behind many of the traditional concepts and propose a radically new approach.

While the authors in this book focus attention on the positive side of Whitehead’s approach, I will take the *via negative* in this introductory section and present Whitehead’s criticism of those insufficient, if not harmful, principles underlying traditional curriculum and teaching in his day. Unfortunately, these principles still operate in our day as well. In doing this, I hope to improve the understanding of Whitehead’s novel ideas.

(a) According to Whitehead, probably the most severe mistake is the sometimes implicitly held conviction that students “progress in a steady, uniform advance from the elementary stages of the subject to the most advanced level which the student attains, a movement containing no changes in the kind of progress and no changes in pace.” (Dunkel 1965, 109)

Whitehead put it this way: “The pupil’s progress is often conceived as a uniform steady advance undifferentiated by change of type or alteration in pace. [...] I hold that this conception of education is based upon
a false psychology of the process of mental development which has gravely hindered the effectiveness of our methods.” (1967, 17) It issues from a mechanist-associationist psychology (and its underlying epistemology and (tacit) metaphysics): single disconnected ideas are mechanically associated in a more or less random way. This is the way learning takes place according to the behaviorists: steadily adding bit by bit of new (isolated) building blocks of knowledge. But Whitehead warns: “It must never be forgotten that education is not a process of packing articles in a trunk. Such simile is entirely inapplicable.” (1967, 33) Instead Whitehead promotes a dynamic cyclic theory of learning (descriptive theory) and of teaching (prescriptive theory) which will be presented and elaborated later in this book.

(b) Intimately linked to the first point of critique, Whitehead directs our attention to the obvious fact that pupils “must be continually enjoying some fruition and starting afresh”; i.e. “We should banish the idea of a mythical far-off end of education.” (1967, 17) Such far-off aims are hardly reachable and therefore easily lead to frustration and demotivation. This position is intimately connected to his concept of cyclic education. Each educational cycle issues in a termination or satisfaction and thereby motivates the student to start a new cycle. Linear, non-cyclic education ends up in failure because it is undertaken “without rhythm and without stimulus of intermediate success and without concentration.” (1967, 20)

(c) Whitehead also criticizes modern compartmentalization of the subjects. Such absolute divorce of subjects neither is good in research nor in education. The basic gap underlying this compartmentalization is what Whitehead had termed the “bifurcation of nature” (see: Whitehead 1920). This bifurcation has its origin in the radical independence ascribed by Descartes to the bodily substances and mental substances. The introduction of two completely separate types of entities: res cogitans and res extensa created two mutually exclusive and therefore absolutely distinct ‘worlds’: a world of quality including subjectivity, values and consciousness opposed to a world of mere quantitative extension. Such bifurcation of nature is mirrored by a “bifurcation of education: the splitting of education into the Arts and Humanities [...] versus the Sciences (usually including technology)” as Pete Gunter (1994, 11f) has correctly pointed out. This dissatisfying situation of
two separately existing ‘cultures’ of learning, “unconcerned with each other if not antithetical” (Gunter 1994, 12) and its unfortunate implications have been thoroughly discussed by C. P. Snow in his famous book The Two Cultures. It was Whitehead who had long before pointed out the negative implications of such a radical separation; and it was his intention to overcome this conceptual bifurcation. He attempted to do this by the construction of his one-type (type-monist) metaphysics. Although nowhere in his books and articles does he dwell further on the implications of this metaphysical bifurcation of nature to the field of education, we may conjecture that he thought that a re-union at the metaphysical level would also result in the break down of the bifurcation in education. Besides this fundamental bifurcation, the splitting up of the sciences into diverse and unrelated fields of research and teaching is another characteristic of the modern world which has to be overcome. This scatteredness of the diverse sciences is another factor contributing to what Whitehead has termed “inert knowledge” (1967, 34) Inert knowledge is what traditional education mainly produces, and therefore it is necessary “to eradicate the fatal disconnection of subjects which kills the vitality of our modern curriculum.” (1967, 6). According to Whitehead, in agreement with John Dewey, “[t]here is only one subject-matter for education, and that is Life in all its manifestations. Instead of this single unity, we offer children – Algebra, from which nothing follows; Geometry, from which nothing follows; Science from which nothing follows; a Couple of Languages, never mastered; and lastly, most dreary of all, Literature, represented by plays of Shakespeare, with philosophical notes and short analyses of plot and character to be in substance committed to memory.” (1967, 7)

(d) Whitehead also warns us not to teach too many subjects. (1967, 2) This point of criticism again is linked to the point of criticism just mentioned. The danger here is that teaching too many subjects will necessarily – simply because of lack of time – lead to a presentation of “small parts of a large number of subjects” (1967, 2) and “the passive reception of disconnected ideas not illuminated with any spark of vitality.” (1967, 2)

(e) Further, Whitehead criticizes behaviorist (mechanist) assumptions concerning learning: “It must never be forgotten that education is not a process of packing articles in a trunk. Such simile is entirely in-
applicable. It is, of course, a process completely of its own peculiar genus. Its nearest analogue is the assimilation of food by a living organism: and we all know how necessary to health is palatable food under suitable conditions.” (1967, 33)

So learning is not a mere passive, mechanical process of adding simple units on a ‘tabula rasa’ and so piling up a heap of isolated bits of knowledge. On the contrary: learning is an active process of assimilation, i.e., of actively integrating new elements into pre-existing dynamic (cognitive) structures. In this way the structures themselves, as well as the newly assimilated elements, are altered (accommodated to one another). “Education must essentially be a setting in order of a ferment already stirring in the mind: you cannot educate mind in vacuo.” (1967, 18). This position closely corresponds to Piaget’s genetic-structuralist theory of learning. Piaget (see: 1968) maintained that human intelligence is the expression of a general tendency toward endogenous reconstruction (by new variations and ‘interselection’) of unstable, exogenous acquisition.

(f) Whitehead also stresses the fact that, when learning, students “must be free to think rightly and wrongly” (1967, 93 italics added). This means that making mistakes should not be conceived as a disaster, which should be hidden or explained away. On the contrary, it should be conceived as a unique opportunity and an additional source for gaining new knowledge. As Daniel Dennet, a well known cognitive psychologist, put it: “Mistakes are the key to making progress [...] they are, in an important sense, the only opportunity for learning something truly new.” (Dennett 1986, 137 italics added) This attitude towards mistakes is a consequence of Whitehead’s radical concept of learning as a genuinely adventurous and endless process of research. “[L]earning should begin in research and end in research.” (1967, 37)

(g) Whitehead, in addition, rejects the principle that “easy subjects should come first and harder ones should only follow these easier ones!” He argues that under natural circumstances sometimes the contrary is the case “because nature so dictates” and because some of the more difficult tasks “are essential to life,” (1967, 16) He refers to the fact that infants have to cope with the highly ambitious task of acquiring spoken language. “What an appalling task, the correlation of meanings with sounds!” (1967, 16) So, according to Whitehead, there
is no need of “postponing the harder subjects.” (1967, 16) Of course the environmental conditions under which hard tasks are presented are crucial and must be very carefully selected.

(h) Finally, Whitehead also rejects the principle of ‘necessary precedence’. Although this principle rests on firmer ground and has some obvious instances of application, it “dissolves under scrutiny.” (1967, 16) The problem with this principle is that it is almost a “necessary truth, and that it is applied in another sense for which it is false.” (1967, 16) Certainly, one cannot start reading difficult texts, before one can read at all. But on the other hand, Whitehead points to the fact that the old songs of the Greeks, Homer’s Iliad for instance, were sung to children well before they were able to read.

This list of eight shortcomings of the traditional concepts of learning and education urges us to turn to Whitehead’s alternative theory of learning and education, to elaborate it, and to examine how it can be implemented in everyday educational work. This task is undertaken by the authors of this book.

**Bibliography**


Part I

THEORY
PART I.1

THE CYCLIC NATURE OF LEARNING
AND EDUCATION
Abstract

Whitehead’s book on education (1967) has been extensively discussed. Interest has centered on his analysis of the three phases of learning: romance, precision, and generalization. There have been useful efforts to correlate what he says on these points with his later technical description of the phases of concrescence of actual occasions. Still more can and should be done along these lines.

I am proposing to supplement this approach by a move in the opposite direction. I want to begin with his discussion of phases of concrescence and move from them to a consideration of teaching and learning. I will focus on what Whitehead says about propositions and propositional feelings, but I will discuss other phases of concrescence also.

It should be recognized at the outset that the phases of concrescence cannot in fact be separated. The physical feelings of the conformal phase, to which I turn first, actually exist only as part of the whole concrescence and its satisfaction. Teaching and learning concern this totality as a totality. Nevertheless, it is possible to accent the contribution to this totality of distinct elements within it. A teacher who is aware of these diverse contributions can direct the learner into activities that emphasize one or another of them.

1. The Conformal Phase

The conformal phase of an occasion is its ‘physical pole’. It consists in physical feelings or causal feelings. The content of the conformal phase is determined by the actual world of the occasion. It is the way that actual world enters into the new occasion.

In the analysis of a single actual occasion, this phase is determined by the past, and for this reason it seems irrelevant to a discussion of teaching and learning. But it is, in fact, far from irrelevant. What an
occasion becomes is largely determined by its actual world, and for that reason influencing in one moment what the actual world will be in future moments plays a very large role in teaching.

If a teacher encourages students to close their eyes, the actual world of those students will change. The role of some of the stimuli that are important when their eyes are open will be dramatically reduced when their eyes are closed. This leads to other stimuli playing a larger role in the new concrescence and perhaps having the chance to rise to the level of consciousness. Alternately, if a teacher encourages students to concentrate on their sensory experience of touch or smell, students will become aware of what they are touching and smelling as they are not when the teacher asks them to concentrate on their multiplication tables. Or if a teacher takes the students on an outing, their experiences will arise out of a quite different actual world.

Much of the educational process directs attention to the supplementary phases of concrescence dominated by conceptual feelings. This is, perhaps, as it should be. For human beings the life of the mind is of immense importance. However, failure to attend to what is concretely given impoverishes experience. Some of this awareness is of one’s own body. Instead of ignoring one’s body or controlling it, one may be encouraged to attend to its role in constituting experience. Some of the awareness is of physical feelings is of one’s emotions as they flow into the present from the past. Some of the awareness is of the wider world as it impinges upon the concrescing occasion. Some of the awareness may be of the feelings of other people or nonhuman creatures. Some of the awareness may be of the divine.

Attending to physical feelings is more likely to be encouraged in the context of religious meditation than in the typical secular classroom. Some Buddhist traditions have been particular effective in getting people to attend to what is, just as it is, allowing more of it to be consciously noticed. In Whitehead’s terms, this is attention to the data of the physical feelings constituting the conformal phase. From a Whiteheadian point of view, it is not possible to separate these entirely from the supplementary phases, but the role of the latter can certainly be reduced.

Some Christian traditions concentrate on awareness of the divine. In Whitehead’s view, God is felt in the conformal phase as a lure to attain what ‘strength of beauty’ is possible in the concrescence itself.
while contributing to such beauty also in subsequent occasions. Orienting oneself to conforming to that lure is a spiritual discipline.

Despite the religious character of much of the attention to the conformal phase, this is not excluded from secular education. An emphasis on this phase of the occasion can also be nurtured in the classroom without religious language. Such an emphasis is most likely to occur in the context of instruction on the arts, which, unfortunately, are often regarded as a nonessential part of the curriculum.

The lack of attention to this grounding in the given reality is a serious limitation of most formal education. It both results from, and is a major contributor to, the dualistic sensibility that plays so large a role among educated people and leads to the deep cultural alienation from the natural world. Without a widespread reconnection of humanity with its physical ground, ecologically responsible behavior is not likely to become dominant. Unless this is encouraged in public education, prospects for it are bleak.

I pass on from this topic quickly, not because it is unimportant, but because it has been ably discussed by one of the leading Whiteheadian philosophers of education, Robert S. Brumbaugh, in his book, Whitehead, Process Philosophy, and Education (1982), points out that if education “is to be realistic, it must rest on a correct notion of reality. If Whitehead’s philosophy is right, that has not been the case for three hundred years and is not the case now.” (1982, 1-2)

Brumbaugh’s point is that for Whitehead the world is as it is given in physical feeling, not as it is projected in presentational immediacy or imagined in intellectual feelings. Consciousness, however, focuses first on presentational immediacy, and secondly, on propositions. Physical feeling, or perception in the mode of causal efficacy, is essential to the symbolic reference that is our basic awareness of the world. But the philosophical theories that have shaped our thought in the modern world have consistently abstracted from these physical feelings that constitute the conformal phase of the occasion. This has resulted in the loss of a sense of being part of the very real natural world. As Western thinkers have recognized and stressed the enormous role of the later phases of concrescence in ordering the content of our consciousness, they have so emphasized this role of creativity as to forget that it arises out of a real world and passes back into that world. Education that leads us thus away from the true reality does more harm than good. Nothing could be more important in the process of education than
brining our physical feelings back into play. And Brumbaugh has many concrete suggestions about how educators can and should do this.

2. Propositional Feelings

To turn from physical feelings to a focus on propositional feelings is not to abandon the former. Physical feelings are an essential component of propositional feelings. Much of what Brumbaugh discusses with respect to our experience of the real physical world actually belongs to the sphere of propositional and intellectual feelings, accenting the neglected physical feeling component. Similarly, the physical feelings are in fact, in our conscious experience, integrated into intellectual feelings. As noted in the introduction, to treat any phase of the concrescence as if it existed apart from the whole is erroneous. Nevertheless, as long as we remember the element of abstraction involved, it is also useful.

A propositional feeling is, obviously, the feeling of a proposition. Unfortunately the usual connotations of ‘proposition’ lead to deep misunderstanding of Whitehead’s meaning. The problem is that most people suppose that a proposition is a verbal statement. It can, of course, be defined in that way. But logicians also use the term to mean that to which verbal statements refer, and this is Whitehead’s use.

In this understanding of propositions, a variety of verbal statements in different languages can intend the same proposition. Indeed, in a single language there can be a variety of verbal expressions of the same proposition. On the other hand, no verbal expression is completely unambiguous. Hence, every verbal statement, simply as such, refers to diverse propositions. The context in which the statement is made, written or oral, usually narrows the range of propositions considerably, but absolute univocity is nonexistent.

Whitehead is unusual among logicians in going beyond this to analyze the ontological status of what is intended in verbal statements, that is, of propositions. Often it is assumed that a more careful and precise verbal statement can function as a surrogate for the proposition. But for Whitehead, this cannot be the case. Language is inherently vague. He speaks of the fallacy of the perfect dictionary. For him, the proposition must be nonlinguistic.
His proposal is that the proposition is the unity of something physically felt and an eternal object. Eternal objects are the objects of conceptual feelings. They are potentials for participation, Whitehead says ‘ingression’ in the world. But in and of themselves they lack any relation to the actual world. Such a relation is established by the integration of a conceptual feeling and a physical feeling. One physically feels a stone and one conceptually feels a certain shade of gray. The propositional feeling integrates these two feelings. Its datum is that stone as having that color.

There is, however, another important step in the definition of a proposition. The term ‘stone’ as used above already says a lot about the object being indicated as the logical subject of the proposition. It implies that that object is stony. In other words, identifying the object as a stone already involves a proposition. The proposition, accurately formulated, has as its logical subject some particular entity, physically felt, but abstracted from all qualifications, that is, devoid of any eternal objects. It might be designated as ‘this’. Whitehead usually speaks of the logical subject of a proposition as ‘it’, insisting of course that it is a very specific ‘it’.

For this reason, when we formulate statements that more directly refer to propositions, we do not begin with ‘The stone as gray.’. We begin, instead, with ‘It as stony.’ We can then move on to the more complex statement – ‘It as stony and gray.’.

The use of ‘as’ instead of ‘is’ is also important for our understanding of Whitehead. Propositions are proposals about how things may be. They prepare for another phase of concrescence, intellectual feelings, in which judgments can be made about the truth or falsehood of a proposition. But the initial feeling of the proposition does not include such judgments. It is simply a feeling of how something in the world may be. Something may be a person and angry. Something else may be stony and gray.

Of course, these statements are vague and may refer to any number of propositions of which some may be true and some false. No matter how much we work at it, language will never unequivocally denote one particular eternal object, simple or complex. It is also very difficult for language to specify a particular actuality.

Consider the case of something that may be a person and angry. This is about as simple a proposition as can be found. But what is being indicated as the logical subject? A psychophysical organism?
Where is the boundary located? Does it include all the actual entities within that boundary? Or just selected ones? If so, which? Just those that make up the psyche? The psyche at one moment or through some period of time? Just what period of time?

Exactly what quality of feeling is denoted by ‘angry’? Is the intention that anger is the dominant quality of feeling in the entity identified? If this is not required, must the anger still be conscious? Or is the entity to be described as angry if this feeling plays any role whatsoever in its subjective form, however minor or unconscious?

Difficulties with respect to anger are minor in comparison with those associated with personhood. What constitutes a ‘person’? These days there are extensive and irresolvable debates about when a fertilized human egg becomes a person. There are also debates relating to when personhood ends. Does it end with death? When does that occur? Does a disembodied person exist thereafter or does personhood require embodiment? Or may personhood end before physical death if the capacity for interaction with others has ended, for example? Or should we say that some members of the species never become persons at all because of severe brain damage or because they are raised by members of other species? Or shall we extend the term ‘person’ to nonhuman creatures as well if they meet certain standards? What standards?

The situation is far more complex with respect to something being stony and gray. I will not review the ambiguities of language in this case, since a quick look in the dictionary will suffice in this regard. But there is an added difficulty. Whereas something may feel anger quite independently of it being perceived by another, there is nothing in the entity being indicated that is in itself ‘gray’, if we mean by ‘gray’ a specific eternal object that sometimes qualifies human visual experience. The society of occasions constituting the stone is not enjoying any such visual experience. As a whole it has no feelings of its own. Assuming that the molecules that make it up do have feelings, there may be some analogy between those feelings and the subjective form of the human feeling of gray. This is an interesting hypothesis. Is this possibility the one that is being raised by the proposition? Or does the proposition really mean that when the light is right, it is reflected from that entity in such a way that human beings with normal eyesight, and looking in the appropriate direction, have an experience of grayness in that region occupied by the entity identified as the logical subject?
Despite these complexities, many of which rarely play a role in books on logic, language often functions adequately for purposes of the needed communication. If I am driving and am told that the pavement ahead is rough, the ambiguities, which are numerous, are usually unimportant in comparison with the evocation of attention and care. The propositional feelings evoked in me may not be identical with those that the speaker or the creator of the sign intended, but the overlap of the propositions involved suffices for the practical purposes at stake.

The same is true if I am told that the date of the American Declaration of Independence was July 4, 1776. I will be led to understand why July 4 is a holiday in the United States, and if I am an American, I am likely to participate in events on that day that accentuate my patriotism. I will also be able to understand something of the relation of that Declaration to the Revolutionary War.

If someone says to me that I am angry, the propositions intended by the speaker may be quite numerous. In fact, some may be false and some true. I may dispute the assertion because of those that are false. But often I recognize that enough of them are true to be forced to acknowledge and deal with my feelings.

Obviously, this is not always the case. The propositions evoked in me by a sign stating that there is rough pavement ahead may not be the same as those intended. I may over-react or under-react. For example, I may suppose that the pavement quickly becomes very rough and slam on my brakes quite unnecessarily. Or I may suppose that being ‘rough’ is a minor problem that need not slow me down, when in fact if I do not slow down, I will damage the car.

Whitehead also calls propositions ‘impure potentials’ in contrast with eternal objects, which are ‘pure potentials’. They are impure because they tie the pure potential to an actuality. They remain ‘potentials’ because they describe what may be rather than what necessarily is. Whitehead also calls them ‘theories’. They are hypotheses about the actual.

For our purposes here, the most interesting definition of propositions given by Whitehead is “lures for feeling” (1978, 25). Our actual world in every moment consists of innumerable actual entities. According to Whitehead, we feel them all. He explains in some detail how most of them are felt in vague collective ways rather than individ-
ually. My point here is only that these actual entities are not ‘lures for feeling’. They exercise causal efficacy in each concrescence by imposing themselves in that concrescence as givens.

However, just how they will be objectified by the concrescing occasion is not determined by the entities themselves. That depends on integrations of the physical feelings of these entities with conceptual feelings. The eternal objects felt in these conceptual feelings are often just those that are derived from the physical feelings, but they are not limited to those.

The differences are not minor. The actual entities making up the stone reflect light that impinges on the eye and through the eye and nerves reaches the occipital globe. In presentational immediacy the colour gray is projected on the region occupied by the stone. One may theorize that there is a real connection between the feelings in the stone molecules and the subjective form of perception of the stone in the mode of presentational immediacy. But there is certainly a great difference between the color gray and anything that is occurring in the stone independently of being perceived.

Again, the situation is far more complex than this. Whitehead believed that the feeling of that entity as gray was at the same time a feeling of it as not black or white or yellow or green. Without the penumbra of other theories about the color of that region of space in presentational immediacy, there could be no consciousness of its grayness. If we consider that in ordinary experience there is not only vision but also hearing, touch, bodily feeling, memory, and much else, we can see that a huge number of propositions are being felt with varying degrees of intensity. No doubt many others are being excluded from feeling altogether, or, in Whitehead’s language, being negatively prehended.

To summarize, the logical subjects of propositions are the data of physical feelings stripped of the eternal objects that in fact characterize them. Whitehead calls the feelings that give us these data ‘indicative feelings’. The predicative pattern of the proposition is given in a conceptual feeling. The propositional feeling is the integration of the indicative and conceptual feelings. The proposition, as the datum of the propositional feeling is the potential togetherness of the actual entity and particular eternal objects.

Although we have approached propositions from the side of human experience and logic, their ontological status does not depend on
human experience. Much less does it depend on any effort to express the proposition in language. They exist as potentials for being felt, whether that potentiality is actualized or not. As noted, they are ‘impure potentials’, since their existence does depend on the actuality of the entities that are their logical subjects. They are defined, as we saw, as ‘lures for feeling’ rather than as the data of propositional feelings. The latter are a subset of the former.

This background enables us to understand what occurs in human communication. What I say to others is designed either to call attention to propositions they already feel so as to heighten their efficacy or to introduce new propositions into their experience. If I think a companion is paying too little attention to where she steps, I may try to get her to be more attentive. I may also give her news about the engagement of a mutual friend.

Again, this is far too simple. Often the purpose of the exchange has more to do with influencing the subjective feelings of the companion, what Whitehead calls the subjective form of feelings. I may remind my friend about the behavior of a political candidate, providing no new information but presenting what is already known in a negative light and with a particular tone of voice. My intention is then to change the subjective form of the propositional feelings already entertained by my friend. Of course, in the process I may also introduce some new propositions. Often, I present these propositions as if they are true, whether I believe them or not, but I may offer them only as possibilities, so as to arouse doubts and uncertainties.

In general, then, much communication is for the purpose of introducing propositions, heightening the importance of some in the experience of the hearer, and influencing the subjective form of the feeling of particular propositions. Other communication may be for the purpose of amusement, of reassurance, of bonding, or even of causing pain. I am making no effort to be exhaustive. The point relevant here is that most of the content of communication consists in the evoking of propositions in the hearer and influencing the subjective form of the propositional feelings.
3. The Role of Propositions in Teaching

Sometimes it seems to be thought that there are just two basic ways of teaching. One is the communication of information. The other is the evocation of already given understanding. Both surely play an important role. Clearly, they also need each other. There are marked limits to what can be evoked from one who has had very limited life experience or exposure to the knowledge of those who are better informed. On the other hand, simply communicating information leads to what Whitehead calls ‘inert ideas’.

Without belittling either of these approaches, I propose that we rethink them, and the teacher’s role in general, from the perspective of propositions as lures for feeling. The teacher’s task is to decide which lures for feeling are best introduced and accented at what time and place. In general the teacher will introduce and accent lures for feeling by making statements. However, the making of such statements, when understood as evoking propositional feelings in students, is no longer to be understood primarily as the impartation of facts.

This approach to teaching is one in which students are invited to consider possibilities. What may be the best explanation of observed phenomena? What is most likely to have actually occurred at a particular point in the past? Why do current leaders take the positions they do? The propositions the teacher seeks to evoke are hypotheses about such matters.

These hypotheses should be plausible ones. Propositions that are too far removed from what the teacher knows to be probable might direct the imagination of the students in fruitless and even dangerous directions. Propositions that are too far removed from what the student already knows will evoke very little response. The teacher tries to evoke propositions that are closely related to those already entertained by students but that will expand the student’s world a little and in ways that will be supported by experience and further reflection.

The statements used to direct attention to propositions are not presented for students to memorize. They are presented to evoke interest. Once the interest of students is evoked, they will develop other hypotheses. Most of these will be closely related to the hypotheses offered by the teacher for consideration, but sometimes they will be quite different. If students want others to take the new propositions seriously, they may explore matters on their own seeking support or
perhaps arriving at new theories.

How directive should the teacher be? If students start down paths that the teacher is convinced are dead ends, the teacher should usually point the student to the evidence most inconsistent with the hypotheses being tested. But from a Whiteheadian point of view, the teacher must be hesitant to block the students’ lines of thought. This is for two reasons.

First, the orthodoxies of one generation are regularly overthrown in later generations. It is too easy for teachers to be convinced of the current orthodoxy into which they have been socialized in their own education. Even if the students are quite wrong in their present explorations, teachers should not discourage them from challenging established assumptions.

Second, there is no sharp boundary between facts and theories. Facts are well-established theories. But well-established theories are never finally-established theories.

An important part of education is to learn this, not as a fact, but as a stance. Obviously, for the most part, each individual must appropriate from the past the well-established theories that constitute ‘knowledge’. No individual can question and challenge sensibly in more than a few areas. But individuals can be brought to understand not only that one should be respectful of received knowledge, but also that one should be supportive of those who challenge it responsibly even in fields with which one is not personally conversant. To communicate this sensibility means to encourage imaginative ideas, recognized as imaginative, but just for that reason productive of fresh thought about what is, in every generation, too easily regarded as ‘fact’.

More than once Whitehead pointed out that it is more important that a proposition be interesting than that it be true. This should not be hard to understand. If a true proposition arouses no interest, it is likely to be forgotten, and unlikely to generate much thought. A false proposition that does arouse interest will not simply be accepted and filed away. It will evoke some testing against other ideas and in terms of implications and consequences. Hopefully, in the process the errors will become apparent.

Whitehead goes on to say that truth adds to interest. A grossly false proposition will soon appear too disconnected from other beliefs to sustain interest. A true proposition of which one was not previously aware can correct and connect existing beliefs and lead to new disco-
very. Truth is certainly not unimportant.

The problem is that truth and falsehood are not so neatly distinguishable in the statements that a teacher can use in the evocation of propositions. All statements are vague and ambiguous. The propositions in the mind of the teacher will not be just those evoked to awareness in the students. Indeed, it is unlikely that any two students will focus on exactly the same propositions. In many cases, some of the propositions evoked will be true and some false, or if pressed hard, all may be false to varying degrees. If the initial statements of the teacher evoke propositions that are sufficiently interesting, it may be possible to sort out some of these issues. Where there is little interest, this will prove a tedious matter indeed!

In general conversation, often the focus is as much on influencing the subjective form of propositional feelings as on heightening attention to propositions or introducing new ones. This is surely important in the classroom as well. But it poses a particular problem for the teacher who wants students to think independently. To make statements in a way that too greatly influences the subjective form associated with the propositions that are brought to attention may block the student’s own critical thinking. On the other hand, much of the interest of propositions is determined by the subjective form of their reception. If statements are made in ways that imply that the teacher has little emotional investment in the propositions evoked, these propositions are unlikely to have much interest to students.

In general it is better for teachers to show in their speech their sense of the importance of the propositions evoked rather than their judgment about their truth and falsity. On the other hand, students have a right to know what their teachers believe as well as what they think to be important. This can be shared more in order to help the students to understand the particular perspective of the teacher than to impose that perspective on the students.

But there are beliefs so important to the teacher, or to the culture and society the teacher represents, that the teacher’s task is more socialization than simply opening up possibilities for consideration. Education is in part transmission of cultural values. Sheer neutrality is neither possible nor desirable. For example, that students allow other students to speak and respond to them respectfully is essential for healthy discussion and learning. It is not simply a possibility to be presented neutrally for individual consideration.