

Philosophy Of Teaching Statement

Before proceeding to a philosophy of teaching, I must first briefly state a simple model of human action. The implications of this model for a pupil will then be examined. Briefly, I think that human behavior is determined by one's values, the ordering of those values, and what one thinks one knows. I refer to one's values and their ordering as one's value hierarchy and what one thinks one knows as one's conceptual structure. One attempts to use one's conceptual structure to obtain what one values. Every potential action involves trading one potential conception of reality for another one. For example, I may go to the discotheque, balance my checkbook, or do one among an uncountably infinite number of options. Moreover, there is a temporal aspect to the trade. It is not only the case that the tradeoff is only with respect to the immediate realities, but also to the consequences which result from each potential action. The immediate value of going to the discotheque exceeds the immediate value of balancing my checkbook. However, the future consequence of balancing my checkbook will be a position of greater financial preparedness and I will still have the money I would have spent at the discotheque. The immediate valuation of these future consequences, as well as the immediate consequences, is known as their present value. If I care little for financial preparedness and am a spendthrift, then the value of going to the discotheque exceeds balancing my check book. However, if I care greatly about financial preparedness and am frugal, then the present value of the future consequences of balancing my checkbook may exceed the immediate value of going to the discotheque. While I certainly do not think that the above analysis is made in a fully articulated manner for the infinite number of actions which may be taken at each moment in time, I do think it is embodied in human action. In short, when one acts, one believes that the action one takes is the action which maximizes the present value of all consequences proceeding from that action.

One must now consider a pupil. A pupil is one who wishes to learn. What does it mean to learn? Before defining learning, I must define knowing. I define "knowing" in pragmatic, in the Charles Peirce and William James sense, terms. One knows something if when one acts on that knowledge, the desired result is obtained. One knows how to drive a car if one can use it to safely get to one's destination. If one finds oneself in a ditch, there must have been an interval of time, however small, in which one did not know how to drive. In general, every time one acts and fails to achieve one's objective, one reveals to oneself the insufficiency of one's supposed knowing.

Learning consists of two phases. First, is becoming aware of a fact, either through articulation or an observed consequent embodiment of the idea. For an example of the former, a teacher may explicitly state a theory of electromagnetism. For an example of the latter, a child may observe that its parent never immediately pushes the gas pedal of the car to the floor upon placing the car in "drive". From this the child learns that such behavior harms the car and may produce erratic driving results. This gives rise to the idea of a role model. The idea of a role model is that not all knowledge and values are articulated, but rather embodied. The second phase of learning is the repeated testing of the fact as indicated in the previous paragraph. The pupil subjects the fact to a series of tests which indicate the veracity of the fact. For example, whenever I am learning a programming language, the first thing I try to compute is $1 + 1$. If I fail to obtain 2, I know I

have failed somewhere. That learning involves a series of tests is why it is sometimes stated that “Learning is a journey.” This is not a mere cliché. Rather it expresses the idea that one typically does not exhaust the set of tests to which one subjects some purported fact. It expresses the idea that some things are never learned. Learning is not necessarily binary. Rather it is sometimes a continuum of embodiment. A purported fact has been more or less embodied through subjection to more or fewer tests. Moreover, there is a stance of receptivity to the idea that the next test one performs may fail indicating the falsity of the purported fact.

One may now return to the pupil. One observation is that if pupils knew exactly what they wanted to learn, as defined above, they would already know it. This should be emphasized. If the pupil knew that knowing some set of facts attended to the pupil’s value hierarchy, then that would mean that the pupil was acting on the facts and that the results were what the pupil expected. In fact, pupils do not know what they want to know. They have only a vague idea. The desire to learn indicates that the pupil thinks there is some set of facts such that knowing those facts will somehow attend to the pupil’s value hierarchy. This means that when the pupil comes to the instructor, the pupil is hypothesizing two conjectures. First, that the instructor knows these facts or, at least, is further along the continuum of knowing them than the pupil. Second, of all the teachers with which the pupil could engage, this particular teacher maximizes the value, with respect to the pupil’s value hierarchy, of the learning.

In light of the above, I think I have three tasks as a teacher. First is to identify a set of facts which will attend to the value hierarchy of the pupil. As exemplified by the short film “Powers Of Ten”, the amount of facts in the universe is exceedingly vast and it is not always clear which facts attend to one’s value hierarchy. While the internet has greatly cheapened the cost of knowledge, it has introduced a new problem, that of filtering. Hence, I must call upon study and experience to curate a set of facts which will attend to the value hierarchy of the pupil. To this end, I have continued to do research since graduating with my PhD. Upon being employed in Data and Actuarial Science, I have sought to further it using the power of complex and functional analysis. This is more thoroughly explicated in my research statement. I have had the relatively unique fortune of both studying the theory and applying it in the field. It has been my experience that the ideas developed from the interplay between my study and experience will allow the pupil to exceed the performance of other practitioners.

My second task is to present the pupil with tests to demonstrate the veracity of the ideas. There are two categories of tests. The first category of tests is to attend to the student’s standard of proof with respect to learning. That is, I must intuit and dialog with the student with respect to what would be a set of tests which would convince the student of the veracity of some fact. Often in mathematics this is done with a proof of some idea. However, this may prove insufficient. For instance, it may not be apparent to the student how the abstraction of the proof relates to more concrete ideas. As an example, it may be worthwhile to manually demonstrate the truth of the power rule in a few specific cases before approaching the general case. Even more potent would be having the student personally derive the specific cases. In this way the student is embodying the truth of the power rule. If possible it is useful to demonstrate ideas analytically, numerically, and graphically. Finally, it is also useful to show students how the

single idea is related to other ideas. For instance, it may be worthwhile discussing why is it the case that $\int_1^e \frac{1}{x} dx = 1$ if one has taken as one's definition that $e = \sum_{n=0}^{\infty} \frac{1}{n!}$.

I have convinced stakeholders of the accuracy of my work and developed my employees using this approach. Before introducing my employees to a large problem, I would have them solve smaller, but conceptually related problems. Moreover, I would have them apply a set of tests to their work to see that their work was accurate. Similar to examples earlier, I have also applied this to myself. Whenever I have an idea, one of the first things I do is test it using randomly generated data. This helps ensure that ideas I have do not simply have the veneer of truth due to my consideration of a particular set of numbers or examples.

The second category of tests is similar to the first set. The second category of tests is to attend to the student's future standard of proof with respect to learning. While this may seem to have a prima facie absurdity, it should be observed that not everyone has fully articulated one's standard of evidence for all time. Hence, it is incumbent on me to draw from my experience and issue tests of learning to the pupil which, upon proposal, will be recognized by the pupil as necessary to demonstrate the veracity of the set of facts. For example, I have long held that schools should have a course, or a portion of a course, dedicated to "dirty" data. That is data with duplicate records, where the supposed key fields fail to uniquely identify records, where a field takes values outside of its supposed range, where a supposed relationship among fields fails, where a field has unexpected missing values, or any other number of problems which present themselves in practice. If the pupil only works with pristine data, it will not be clear to the pupil in the future that the various programming or modeling techniques previously learned are still applicable.

The third category of tests is predicated on the presumption that pupils do not seek a teacher for the sake of the facts themselves. The pupil intends to act on these facts in the future in order to attend to the pupil's value hierarchy. This may involve a third party (e.g. an employer) who will consume the work of the pupil. Hence, I must also propose tests I believe will suffice as evidence for such a third party. In my experience, such consumers want to know the work is produced swiftly and accurately. Thus, it is my responsibility to provide the student with many problems on which to practice. In practice, this will most likely make use of banks of test questions, either online or in a book. In my experience, sufficient practice yields speed. With respect to tests demonstrating accuracy to future consumers of the pupil's work, I will disclose to the pupil tests whose completion have been accepted by consumers of my work. For example, if one is performing data manipulations, one needs to posit some property of the data which is invariant under the manipulation. As an example, if one has summarized company revenue to the level of division from transaction data, then the total revenue from the transaction data and the division summary data should yield the same amount. As another example, model output, when summarized to the level of a particular model variable should yield behavior similar to the sample average of the target variable of the model at each value of the model variable, although with smaller variance.

My final task is to do the above with minimal cost to the pupil. The pupil could literally be doing many other things with their time. As a teacher, I consider it an opportunity that the pupil

wishes to trade their money and time for my expertise. Hence, I must concentrate on what I consider to be the facts which most attend to the pupil's value hierarchy, demonstrate the veracity of those facts with the minimal number of tests, and recommend a minimal number of tests which I believe will suffice as evidence for a third party. Ironically, this is done by providing the pupil with a large number of tests through which to embody the facts I have explicated. Depending on the nature of the course, this may be done through the provision of an online bank of practice problems, problems given in a textbook, and problems I generate. The student may then practice until they believe they have achieved sufficient mastery. I intend to respect the time and money of the pupil by minimizing the amount of it necessary to sufficiently embody the facts I have curated.

Grading is where I act as an avatar of future consumers of the pupil's work. It is an attempt to numerically represent the totality of embodiment of the promulgated facts. This is measured along the dimensions of accuracy and speed of production. In the age of search engines, it is theoretically possible for anyone to learn anything. The question is how long will it take. Consumers of the student's work would prefer results sooner than later and are not interested in waiting too long for results no matter how accurate. Hence, when formally testing the pupil I am interested in both the accuracy of their work as well as the amount of it which can be produced in a given amount of time.

Finally, I can write what it means to be a teacher. I am a teacher if more of the pupil's value hierarchy has been sated by interacting with me than if the student had not interacted with me during the same interval of time.

In summary, human action is a function of one's value hierarchy and conceptual structure. Something is known if action produces expected results. Learning occurs through repeated testing of that which is proposed as true and is thus a continuum of embodiment. A pupil comes under the tutelage of an instructor if the pupil hypothesizes that the instructor has curated a set of facts which will attend to the pupil's value hierarchy and that the instructor will facilitate the embodiment of those facts in a manner more satisfactorily than other options open to the pupil. The task of the instructor is to curate a valuable body of facts and produce a set of tests to demonstrate the veracity of the facts to the pupil as well as future stakeholders of the pupil's work. Finally, I will have been a teacher to the pupil if more of the pupil's value hierarchy has been sated by interacting with me than if the student had not interacted with me during the same interval of time.