Of Joy and Responsibility of Coming to Understand: Transforming Schoolwork into Learning

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Abstract

This is a thickish description of how an educational technologist who has transformed first himself into a knowledge building teacher set on transforming his students into (hopefully deep) understanders. The few pages of student impressions included here are carefully selected for the theme of deep understanding out of many pages collected over two and a half years and ten courses. Each one is representative of the many ways students come to realize the joy and responsibility of learning and understanding.

> *I doubt that I can adequately express this but if and when we are able to carry on this course in the level it deserves, only then we can really open up and see the face of the real science… (student quote)*

I'd like to start first with my transformation from a technological educationist to an educational technologist. I really was a technological educationist until my transformation noticeably began on a crisp March day in 2004 when I read the following paragraph that came up in one of my Internet searches:

> **Our Oldest Unchallenged Folk Theory at Last Faces Its Day of Reckoning**
> Something is going on in elementary schools across North America that might strike the detached observer as insane. Millions of dollars are being poured into high-tech equipment that is used mainly to produce the kinds of 'projects' that in an earlier day were produced using scissors, old magazines, and library paste. At the same time, and in the same schools, a back-to-basics movement has teachers obsessively concerned with covering traditional content and preparing students for tests…

These opening sentences from Carl Bereiter's book Education and Mind in the Knowledge Age made me think intensely about what was to come in the rest of the book; a bright light of curiosity and hope lit in my mind. I spent the next few months after this momentous occasion reading the book and anything else Bereiter published, and soon Scardamalia and IKIT followed. A year after my turn of luck, I wrote about my transformation and position to a friend in Japan as follows:

> There have been some significant changes in my perspective on education and educational technology since I have been to Japan for a conference in October 2003. My work at that time was grounded in a logical analysis of the processes of creating digital materials, presumably appropriate delivery of which would lead to desired student learning outcomes. Underlying this presumption is the conventional instructional design theory which assumes that knowledge can be imparted if it is informationalized and delivered properly to assure projected student learning. The process of developing and delivering the results as materials are bound with the notion of quality, the assurance of which is hoped by sticking to some aptly formed principles and standards in the phases of production and delivery. Coincidentally, I started questioning my own assumptions in Japan when a conference attendee commented that no matter how you design the online material and experience, students will develop strategies to beat it in order to fit it in their

own agenda. Interestingly, I have listened to the same person in 2004 as a keynote speaker in a major e-learning conference in Europe; alas to my dismay, he and another person clowned on the podium playing the wiseman and the village idiot in their effort to envision the future of the field, whereas they only accentuated the trivial and skipped around anything of fundamental value to the discipline. Perhaps they were intuitively responding to a perception that e-learning has attracted mostly those that travel the land of education myopically after the quick and ready solutions, but without a magic wand. Oh well, that pertains to my days in the dark, too.

What is different now? I was able to connect some major dots in a lecture by Noam Chomsky who emphasized that dealing with fundamental questions of science will help us understand our world comprehensively and coherently. Beyond the obvious economy this suggests, dealing directly with fundamental problems will also help us surpass ourselves, for we are the only species that can develop a consciousness, have the ability to think, and can contemplate abstract concepts. What is significantly different about me now is that I no longer look for the absolute truth or the true nature of anything, indeed, I realized that chasing the absolute is an effective diversion when one is seeking the truth.

Biological evolution accounts mostly for our physical body; we need to look at the cultural evolution for explaining our minds. What I have expressed as my personal evolution, of course, is no news for the scientific disciplines -- only for education. What we seem to need in education is to inquire into its fundamental problems and develop concepts and conceptual tools that will function in the way germs and bacteria do in medicine. As in all serious science, the fundamentals are based on philosophy, particularly on epistemology. Despite the inevitable practicality of educational endeavors, we seem to need an underlying new and improved theory of mind and knowledge to replace folk psychology.

That is only the educational side of my area, “educational” technologies. Ed Tech is mostly ridden by technology, a convoluted and disputable area in and of itself. More often than not, technology searches for a problem to solve, rather than other way around, and traditional teaching falls pray to it, mostly thanks to administrators and promoters who assume a mechanical teaching and learning process can be made more effective by technology. A lot of resources are wasted because teachers are not included in the reforms as active participants but inserted as actors to carry out their scripted roles. Technology is mainly a solution to a specific problem, and the problem is not educational. The web, as the latest example, is more like a modern postal service with instant and ubiquitous delivery of information; however, information is not instruction. All technologies can benefit education only if they are solutions for educational problems. Some technologies actually do that! The example I have in mind is the CSILE/Knowledge Forum (KF). Bereiter and Scardamalia have constructed the idea of knowledge building and helped develop software to support and sustain the process. Technologically speaking, KF is not a state of the art database but it is just right for the task it is designed for. Same goes for web-based applications. To the technology pundits, the bandwidth is never enough; whereas for educational uses what’s needed is usually a convenient medium to get message across. It would be nice to have high quality video, but that can be mailed in advance. If one needs to get voice across, the telephone is easily available. In short, most educational needs can be met with available technologies in addition to some new technologies that are developed to meet well studied educational needs. And, that should be the actual business of educational technology.

Only after my own transformation, was I able to get started on teaching for understanding with my students. I can say that my students are deeply affected based on based on what they describe themselves as experiencing: shock, disbelief, skepticism, dismay, wonder, pure intellectual joy along with a complementary headache, a taste of sweat and sour yet deeply revealing intellectual powers. I am aware of embarking on a never ending voyage for understanding, but I can still detect my main trajectory in it. My initial understanding of becoming a knowledge building teacher was that I had to clinch the constitutive problems my courses were about. Those had to be problems of understanding so that my students can engage in collective endeavor to build on them. I brooded over how I can accomplish adopting the knowledge building pedagogy. I reasoned that my courses should be problem oriented and idea centered. However, that was easier said than done. I struggled because I realized that I implicitly considered myself as a conveyor of "knowledge" who lectures to get students to think about what I conjectured they need to learn and understand.

"Technology Tools for Teaching for Pre-service Teachers", a course I taught for almost ten years, was the first course I attempted to teach with KB. The transformation began with the name, which became "Understanding Education and Technology", as it was explicitly clear that educational technology makes sense if and when it addresses educational needs; and an educator cannot appreciate the value of technology in education without a substantial understanding of education. Next, the departmental freshman course "Introduction to Educational Technology" was subject to a similar treatment. Our incoming freshmen are placed in our program after they take a nationwide university entrance test. Top schools admit about 5% of the five hundred thousand who are placed out of a million and a half test-takers. Incidentally, most students who will "make it" into their first or second choice of high ranking programs reportedly prepare for the big test by answering more than twenty thousand practice questions. Most our students are top graduates of vocational schools that provide a traditional education in which students have negligible influence on decisions about what, where and how they will learn. Among other deficiencies, they are ill-prepared for knowledge building, they are not aware of their epistemic agency at all, and they are poor writers.

Advanced "e-learning" was the third course to be transformed. It became a venue for students to design technology supported learning experiences dealing with inherently difficult concepts, such as acceleration, probability, light year and physical energy. Teaching about difficult concepts helps students differentiate educational problems from technological ones and align the technology with the learning goals.

In sum, my initial formulation of teaching for understanding using knowledge building was that it was incumbent upon me as the instructor to come up with the constitutive problems of the course and formulate them as problems of understanding so that students can get on with them directly and collectively. I defined my role as the provider of structure, problem initiator, and sustainer of the process. Foreseeing the possibility that my opinions might "stick" with students as the "truth," I refrained from voicing my opinions about the problems until students were ready to view then critically.

Bereiter (1990) argues that all learners develop "contextual modules" that are interdependent "complex[es] of knowledge, skills, goals, and feelings" triggered when learners face a difficult task. Such modules provide a coherent response to most anything that happens in school. "Schoolwork Module," for instance, treats all challenges as "work that is too hard." To cope, students use various stratagems such as "obstructive procedures" or "getting the teacher to take over the cognitively demanding parts of the task." "Intentional Learner Module," on the contrary, is organized around different goals; "goals of personal knowledge construction rather than goals of task performance" (p. 616). Accomplishing a difficult task by the Intentional Learner Module enriches the students' self-concept, whereas Schoolwork Module seeks to complete, negotiate or evade the immediate task (Bereiter & Scardamalia, 1989).

It became quite clear over the first couple of semesters that most students were operating in their schoolwork module, and knowledge building dynamics were in conflict with it. I had to spend considerable time and effort to point out how they were subconsciously going about their usual business of learning and contrasting it with being an intentional learner. Inspired by one facet of learning affirmed by cognitive sciences in recent decades that one learns about whatever they are occupied with in their minds (Bereiter, 2002) and genuine interest should involve the mind expansively, I created a fictional chart that plots the effect of schoolwork and intentional learner modules in terms of time and effort patterns devoted by a model student for coursework (figure 1). I think the chart is pointing towards a real trend as told by my students' doubtful but admitting chuckles when they recognized themselves in the chart

Students' initial impression appears to be a fair amount of fear fomented by operating in uncharted territory in their habitually adept schoolwork mode that hinders more than it helps.

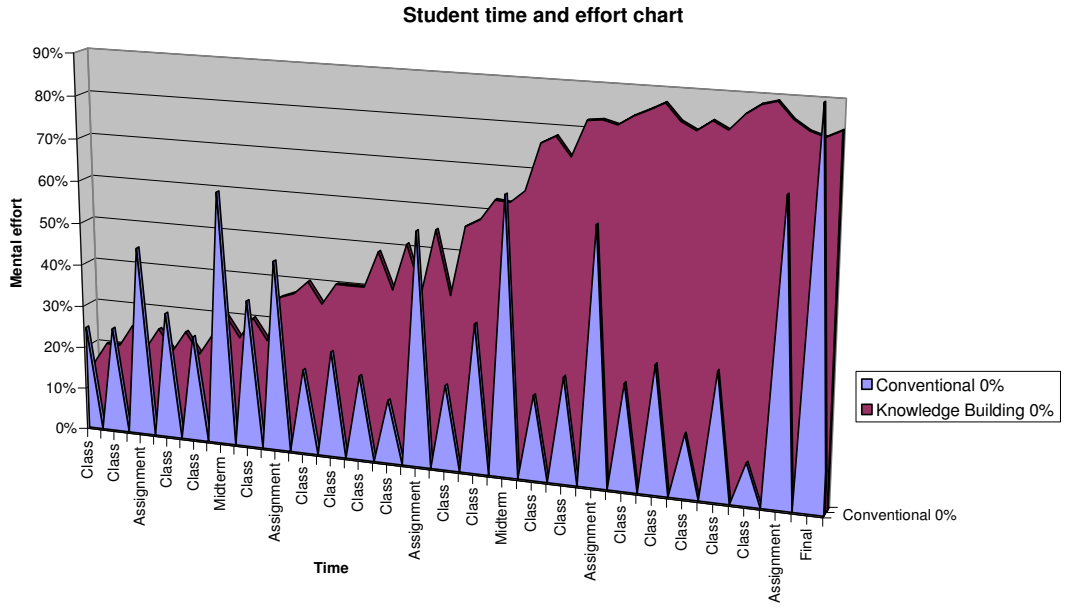

Figure 1 The amount of time and effort for coursework by a student

Even though students are not intentional learners, what schools sets them up for may need a more comprehensive explanation than person-level modules of schoolwork and intentional learning as units that influence their behavior. Bereiter bases Knowledge Building on a theory of mind and knowledge (1991, 2002); that of a connectionist mind and a world of knowledge to be acculturated to. "Schoolwork" and "intentional learner" modules are formulated in the intentional level where complex learning is the dependent variable on students' mental effort for learning and understanding. On the other hand, how do we account for the emergent properties and the subconscious processes that are in effect? Coming to understand, however, appears to be the work of many already in place learnings and understandings which get expanded to new ones. How thoughts and learnings self organize themselves is most likely to be the work of preservation principle of natural selection.

> What, then, is a mind? The Darwinian answer is straightforward. A mind is a crane, made of cranes, made of cranes, a mechanism of not quite unimaginable complexity that can clamber through Design Space at a giddy–but not miraculously giddy–pace, thanks to all the earlier R and D, from all sources, that it exploits.(Dennett, 2002)

Bereiter poses self-organization and emergence as general rules of nature, understanding of which requires explaining the bridge from neuron to mind (2002, p. 200). I suspect this is where Bereiter comes from in order to frame the phenomenon of becoming an intentional learner with all the beliefs and desires a student consciously brings about along with the remaining subconscious processes. Dennett formulates opinions as language infected beliefs, which are in a functional position in the mind without implicating a language of thought (1998), and this seems very similar to what Bereiter (2002) means by implicit understanding, beliefs that are in a functional position that may also be expressed as opinions or statable knowledge.

The basic assumption of my approach is that all students are intelligent and rational (Stanovich, 2004). They try to do the best for themselves with what they know and need. This practical rationality requires students to craft and carry out strategies with respect to their goals. Topics manifestly difficult to learn serve as a suitable test ground for this type of rationality, as in the case of intentional learners who are able to suppress their schoolwork module in order to accomplish their explicit learning goals (Bereiter, 1990).

> Sometimes, though, I find myself saying "Damn, how come I can quite easily express my thoughts in the class, but find it so difficult to write them and it takes so much of my time?" The reason, of course, was the difference between spoken and written language; I told myself "You smarty! Writing demands a lot more labor and effort." I have spent considerable amount of time this semester in front of a computer trying to compose my thoughts and transform them into sentences. I say this is a very laborious undertaking. I sometimes spent 2-3 hours reading comments and thinking about the topics, all of which are open-ended with no definite single answers.

In my practice, I was facing expert students with incisive schoolwork modules and a few disenchanted intentional learners with none who is familiar with collective knowledge creation.

Only recently I was able to see one major reason that throws off my students: lack of exams. Students soon realize that "no exam" is more than a charming course opener.

> It was when the instructor said "this course is difficult because there is no exam" I realized the futility of our expectation for an easy course. This one is difficult because there are no cut and dry evaluation criteria. Coming to class, participating in the discussions and contributing to KF are the only criteria. This is more difficult than taking an exam. (But I am not complaining, the harder is better every time!!)

Students' remarkable priming for being externally evaluated seems to delay their recognition that sometimes being involved in the process with an effort to monitor and assess the learning and understanding of others, as well as their own, suffices as a goal by itself. I believe their hobbies are the closest they come to such a situation. I ask about their hobbies at the beginning not just to be acquainted with them but also equip them with relevant prior experience. The oddity of talking about their hobbies as serious course topics is soon forgotten as they realize having fun is mostly about forgetting time and space; two concepts that are quite conscious of in schools.

I bring in the idea of knowledge building after two sessions with introductions. Talking about recipes sets the stage quite well because students get a firm grip on how abstract ideas and knowledge can still have a manipulable physical representation. I have them write up their favorite recipe on a piece of paper without their name, then I collect, mix and distribute the recipes back randomly. I ask them if they recognize who wrote the recipe they got. Most cannot. Then I tell them the following story:

> As you dump the recipes in trash bin on your way out of this class, they would be noticed by our custodian who picked them up and made into a cookbook, which will be wildly successful. Recognizing your own recipe as you pick up a copy of the book, you will rush to a lawyer claiming that you have rights to this cookbook. But, you need to make a case. It is nearly impossible to trace the origins of printed material without any other authentic copy to compare with. Moreover, a recipe is short enough to defy any text analysis to ascertain the author.

This provides them an opportunity to reflect on several relevant properties that knowledge can be abstract but real, can be represented in physical forms and can be improved, as we talk about how changing the ingredients and their amounts may improve the recipe. Incidentally, a recipe is an excellent example of a cultural artifact that is structurally similar to a conceptual artifact. Students are pleasantly surprised to be able to transform unscholarly topic of recipes into to the level of idea improvement.

Next, I introduce the problems of "why something is worth learning," "different learning objectives," "experts and expertise," "what is teachable and what isn't," and "instructional technologies." We both use and analyze Knowledge Forum as an aptly designed educational technology. Soon enough, the class rolls into knowledge building, and I try my best to refrain

from pushing the buttons of their schoolwork modules. We sit facing each other in a round formation, I treat them as people, I respect their ideas and welcome variety, and they slowly come forth to share their ideas.

The following is a selection of student impressions that I collected over several semesters and nearly twelve courses. I ask my students to provide their course impressions twice or thrice during the course. These quotations are selected for their relevance to the theme of transformation from surface and strategist learners to deep learners and understanders. I think most speak for themselves. Each paragraph is written by a different student and some are translated from Turkish with an effort to keep the original tonality.

Sitting in a U format, everybody can see one another and has an equal opportunity for joining in the collaborative effort. Their initial reluctance to air their ideas gradually turns into talking with gusto as they realize that it is the ideas that count and we do not get personal.

Most are not familiar with a democratic class discourse as well as working on idea improvement.

> The class is different, and it helps to questions things around you. But I think I get lost, maybe because I am too product oriented, I don't know. I feel frustrated when we talk about many things and still do not have a final decision on things.
>
> I've seen how simple questions branch out and become fuzzy. Sometimes there is too much verbiage going on. We may be losing the sense of what we talk about as we try to bring in different perspectives. In such times I mind wanders every which way.
>
> I wish that my all classes were like that: without tension, interesting, joyful... I real like our assignments. Each of them makes me curious and enthusiastic. Any of my contribution let me discover myself.
>
> It was a beautiful thing for me to be able to trust myself and my opinions in expressing them freely in a free environment.

Active and deep thinking is a term students often use to express their engagement in class meetings:

> [It is] last day, 3.5 hours before the "finale"… Comparing the first day of class with "now" (this day, this hour)… There are huge differences… But I really learned thinking. If I could use a rather old Turkish word "tefekkür", meaning think deeply, to contemplate: I learned a bit of that.
>
> I was irresistibly curios about the rest of the course right from the beginning. It still does not feel like being in a class. However, I leave the class all perplexed and confused. Who knows, perhaps I am learning how to think.
>
> Having composed a theory of my own in this course, I realized that I needed to inquire a lot more about the topics I thought I knew.

> I really wish that I took such a course in the first year of my college life. I learned to be able look at a concept from various perspectives here.
>
> The question we'd normally ask in a class is "what is the point?" Here we were asking "where are we?" and, occasionally, "what are we?" Soon enough we doubted if we knew anything at all. Headaches can be expected towards the end of the class due to intense thinking.
>
> I observed how even the simplest question can become the most difficult when deeply inquired about.
>
> I must confess that [knowledge building] is not an easy undertaking. You have to do considerable thinking, researching, and deeply concentrate on the topic in order produce your own theory. It was a bit of a stretch but it was also very beneficial…
>
> The best thing is to learn how to inquire and think, in the meantime, we realized that a lot of things we considered easy turned out to be otherwise.

Students were also able to develop a critical perspective on learning and understanding, which is one of the objectives of my courses:

> Most important of all, I have significant changes in the way I think: now I question even the knowledge of so called authoritarian sources.
>
> The veil of uncertainty surrounding our class has recently begun to shred. … We now know the goal of this course: to make us nauseous with educational technologies. And that is exactly what happens. We can no longer accept anything in its face value. We get nauseous!
>
> Ever since I am constantly trying to put everything I read and others tell me into a logical form and attempt to discuss about them, some of my friends don't want to study with me anymore. I cannot take just reading about something as knowledge any more :(
>
> We can comfortably express our thoughts in the class and practice what it actually means "to think critically." Especially, what we started doing last meeting --call it chat, discussion or whatever you like-- made me recognize a very important problem: I actually can't explain many of the ideas we have been taught for years, let alone distinguish among them. The definitions of "education and instruction" as they are provided in other courses are not satisfactory, nor are they applicable.

A sense of self-directed learning and responsibility of being free were also brought out by students. They are probably referring to their epistemic agency.

> As I look back to the term, despite the fact that I was frequently quite confused and occasionally felt intellectually challenged, I actually think that this course was very helpful to me in collecting my thoughts together. My initially piecemeal, free floating ideas increasingly became more orderly and connected. In short, I learned how to think and develop coherent ideas; it breaks my heart that the course ends just when I am able to do so.

> We chose what to learn from our notes and classroom discussions. We were free to take or leave it as "knowledge." How to include students in the process deeply and responsibly is the problem for the entire educational system. I feel that we have solved it here. Have students comment, inquire, ask questions and follow their muse without preemptively worrying whether it is right or wrong. Ask students some leading questions. This is the first time I ever thought so deeply in a course and learned so deeply. Learning is not superficial brain gymnastics, which we often do. Here we just delved into the topics and got inquiring left and right. Our theories were the building blocks of our learning process.
>
> I am learning not to accept what the instructors say without questioning. Besides, I no longer wait for a conclusion; I am gradually coming to my own conclusions.
>
> I realized that it was my responsibility to learn and how peculiar it was to participate in a student-centered class… We had the opportunity to think and discuss topics that would generally be either rushed for lack of time or just presented.
>
> The most pleasurable aspect is absence of "must". I feel like I do something only because I want to do it. Sometimes I feel myself as a part of a working brain.

Students constantly worked with ideas and their improvement.

> Now [at the end of the term] I am able to say this: we haven't just talked about things. On the contrary, we made an effort to internalize them from their conception to their maturity. And we weren't just witnesses to the process; we felt every moment of it and surely we all poured some of ourselves into it.
>
> You learn how to defend your ideas and opinions. Confronting different ideas makes me go, "Am I really right about this?" or "Is this the right way of thinking?"
>
> In addition, I feel that [this] affects my daily life. I see that many topics are quite discussible; many ideas and theories have various improvable and changeable aspects. This made me aware of the need to support an idea from several perspectives in case others attempt to falsify it.
>
> I realized that there is no ultimate point in doing knowledge building. There is a continuous production of new ideas and interpretations. I realized that most of the present concepts cannot be properly explained. I come across quite a bit of conflicting concepts. Words are insufficient to talk about them. Perhaps I have word for it, but I cannot describe it. When I hear new things, I go "yeah, there is that, too."

Students were able to recognize the joy and beauty of collective work:

> I noticed that we do quite many things in life without collaboration and without our own initiative.
>
> The most beautiful aspect, however, was creating all this as a communal effort.

> We inquired about many topics during the term; we all contributed to knowledge building; everybody wrote as best as they can; however, the result is collective learning.... It was beautiful to see how complicated our minds are and great things come about when we are able to think collectively.
>
> I also like the fact that the learning goes beyond your own understanding and taps into every other student's.
>
> I like knowing the ideas of classmates. It allows me to review my ideas, look at things in different ways, as well as make me think.

Students are involved in the knowledge building process and they usually ask if their database will be accessible after the course. Some are also emotionally attached and find it hard to go back to business as usual.

> Ending the course left me with a heavy feeling of remorse. Why? We are separated from a learning environment where everything was constructed from scratch; where student ideas were accepted; where knowledge was literally in the air, and differing approaches and viewpoints were a part of the solution rather than the problem.
>
> I noticed that this class pushes me to think about terms and concepts that I have previously been using freely and easily. Now I go "what I am saying?" about almost everything. I ask myself "do I really know what I am talking about?" before I start to speak. Yes that "big words" and "Martian" stuff helped me to question myself. I was like (and I must admit that I am still like the) the "young man" in Emerson's "American Scholar". "Meek young men grow up in libraries, believing it their duty to accept the views, which Cicero, which Locke, which Bacon, have given, forgetful that Cicero, Locke, and Bacon were only young men in libraries, when they wrote these books. Hence, instead of Man Thinking, we have the bookworm."

Here are some excerpts form students writings on the problem of different learning objectives illustrating their progress and transformative approach. I have my students deal with difficult topics that are always talked about but very little is done for teaching in schools. Among different objectives such as "how to train taxi drivers who knows their way around the city" and "patience education", students of this six-week intense summer course dealt with the objective of educating people with a "free conscience." Incidentally, the Turkish education system has the symbolically expressed grand goal of educating people who are "free in their knowledge, their ideas, and their conscience" as expressed by a 19th century progressive poet. Great expectations, but how do we get there? After an extended war of opinions between those who think conscience is innate and cannot be changed much, and those who think one can educate for a free conscience, students eventually realized their actual task is to provide an education for it:

> As for the topic of "educating a free conscience", up to now education brought to mind the sort we have seen in schools, an instruction with a certain direction and method (to a degree). But, examples such as appreciating music and expertise has shown that we going to have to do something different than the methods we are "familiar with" in order to be able to accomplish the "unfamiliar different learning objectives". How can we do this? Since we cannot negotiate a common judgment

of “good” or “bad” this education cannot have a common objective. The only common objective of these topics is to educate people with a “free conscience” or people who “appreciate” good music. I hope that we all agree on educating such people is something beneficial, at less not harmful in any way. Then, what sort of a path should we follow? That is where I am not too sure. It appears essential that we expose people to these topics sufficiently longer. Well, does this mean an aimless education with no system to it? This is the part where lies most of my questions: who’s going to set the direction; whose values and taste will be the measuring stick? Can people reach the desired level by just being exposed without any goals? What is the desired level and how can we determine it? Or, is that really necessary for people to accomplish a certain goal or to reach a certain level? In that case, we can provide a certain education based on “different learning objectives.” What we need in order to provide this education is to have people meet and familiarize themselves with these topics as well as reflect on them; it also appear that we need to provide an environment conducive to their internalizations of these topics. If that is all there is to it, then we can provide an education about anything (including expertise). The only other thing I am curious about is how we are going to recognize whether we are successful or not.

Anybody who grows up in a free environment where his ideas are valued will automatically have a free conscience...

I don’t think it is that simple. We are influenced by other things in our lives in schools and homes, by TV and newspapers as we grow up.

I think you are right about it being not so simple! The more I reflect on it less sure I become.

Everybody has a character and their idiosyncrasies. I think most human characteristics can be improved. As for conscience, we cannot provide a direct “conscience” education; it shapes up within the ordinary life with the effects of the environment.

In summary, when the interactions the child is involved create a tension in him, then it will demonstrate his free conscience if he could reach a free decision and listen to his inner voice. Therefore all those who are around the child, be it his parents, teachers or whomever, should be able to observe this internal conflict, try to create such occasions even it is contrived and set a model as to how to behave in such occasions.

I see that such occasions will assume that the child is capable of free thinking. One cannot be without the other.

Up to now, I thought that conscience was an innate concept that was influenced by the environment, but after reading the note “the step before the education of free conscience: development of conscience” I began to think that I might be wrong. It seems we start our conscience education after our decision making and thinking capabilities begin their development. This education is influenced primarily by the moral values of the individual’s society and (if he has it) his religious value, as well as other factors ranging from social class to economic status. That is to say, we are all in the process of education of the conscience from birth to death.

As a pre-service teacher unfortunately I first thought about the objectives of topics we were supposed to teach before we have gotten into the topics deeper. But there are more difficult and complex learning objectives such as the one we have been discussing for a while: educating people

> with a free conscience. And the more we discuss, the more complicated it gets. The most important reason for me to pick this topic is that I am so surprised about the difference in my thinking between now and the beginning. If we haven't dealt with this topic, I would have thought I knew the concept of conscience but now I understand how important this topic is for us and I knew nearly nothing about it.

To conclude, treating people as persons gets reciprocated by them; seeing that their ideas are respected and valued helps students effectively break the mold; the inherent open-endedness of well selected problems of understanding help divert students' attention from seeking singular final answers for external exams to concentrating on genuine learning and understanding. I let them live through their frustrations, perplexity and joy, but I help them get out of the rut and turn to more promising directions. I strive to keep their minds busy with the relevant questions and directions. If I may say so, my teaching motto is to make the problems of understanding in each course the same problems of understanding that my students experience. That is my challenge as a teacher.

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