

ILSIME

Summer Fellowship 2005

Educational Transfer Plan

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2005 Education Issues

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My Action Plan

My 2005 Action Plan is a reflection paper of educational issues that will affect me during the school year. I did not acquire any new technical skills while working at Dow Chemical. However, I did get a greater appreciation for the Dow plant and the processes to ensure safety. I also received many insights into: personnel hiring; state and federal regulations; ergonomics; global competition; the need for a competent and skilled workforce. I gained these insights through: Dow personnel conversations; two television shows; and reading educational articles in the summer's newspapers.

Background

As political forces move to reform the education system, the debate continues on how to best attain student educational success. Pacing, grade inflation, standardized tests, evaluation of teacher, student and school performance are just a few topics California educators will be dealing with once again. However, with every "solution" presented by the state, the general public or administrators there is a cost and a downside that most people are not willing to politically deal with. The forces pushing individual academic success are at odds with those who wish to ensure academic knowledge is attained.

In teacher terms, how do you ensure that a student gains knowledge of your subject and is properly assessed with a grade given the pressures of high grade point achievement for college entrance requirements? As a society, most students expect to receive A's or B's as the norm. Unfortunately, not every student can receive those grades. In my teaching experience, my old fashioned grading system of 100% to 90% - A, 89% to 80% - B, etc. is out of step with what parents want for their "college bound" students. How do we in the teaching profession go back to properly and unbiasedly evaluating student performance without sacrificing curriculum? How do teachers do this when the state's expectations of success are not realistic given most students' socio-economic backgrounds? And even when those socio-economic factors are in place, student success is not always guaranteed.

Over the course of the summer, I viewed a few television programs that dealt with college education, trends in higher teaching, and the economic impact of our college system. Also, I talked with employees at Dow and how they view both college and high school graduates preparation into their work place. Ultimately, the grades students receive both in high school and college do not mean anything if the student is not prepared to become a productive member of our society's workforce. A productive member of society is the goal of education. The question remains if our current education system is producing a workforce ready to compete globally. Unfortunately, as the evidence will show, the answer is ambiguous and leaning more and more to "no".

Trends in higher level education

College Education Questioned

A recent PBS special looked into college students and their learning environment. The first finding was how unprepared most students were going into college. Most students had breezed through high school and were never academically challenged. Consequently, most students did not develop or attain the proper studying skills to be independently successful in college. When confronted with their lack of study skills, most first-time college bound students stated that they hoped to develop these learning skills while in college. The college bound students' attitude was one of indifference or apathy assuming that the discipline would come with ease. Later, the show followed these students and showed how most dropped out within the first year when they could not rise up to the challenge.

The show then talked with college professors and their academic adjustments to an unprepared student population. Professors acknowledged that they were reducing their curriculum expectations knowing that most students were not reading the text book between lectures. In addition, large classes made it difficult to give interesting and affective lectures. The show actually showed some students falling asleep during in a large lecture hall while others stared generally disinterested. The lecture hall apathy appeared to continue in other academic areas such as small group study sessions or individual academic efforts. As one professor acknowledged, visits to her office hours were mainly for students attempting to drop the course and few were there to engage in course material questions.

When asked about the student indifference to the courses, the professors acknowledged being disconnected from their students due to large class sizes. Many professors did not know the names of most students or if students had regularly attended class. Many students admitted to not going to lectures and attempting to learn on their own. The students would learn what topics the professor wanted them to learn and regurgitate the material back. Both students and professors, stated that critical thinking skills or applying knowledge to new situations was not emphasized. Just the basic rudimentary facts and knowledge was requested.

With the curriculum either watered down or not affectively delivered, how did the university's administration confront this situation? The professors admitted that administration put pressure on them to give passing grades and maintain high student passing rates. One professor described the relationship between the faculty and students as "if you do not cause me trouble, we will not cause you trouble." As long as the student came to class and tried, the professor would lower the standards enough to give the students a passing grade. Students in turn would not complain to administration about a professor or their teaching style. Both students and professors admitted that grades are now convoluted to the point where they do not reflect knowledge of the subject but the ability to persevere through the course.

When addressing the large courses, administration officials cited their school's economic constraints. Delivering knowledge in smaller class sizes would mean raising tuition costs which in turn would prohibit some student from entering the university in the first place. A traditional solution to reducing class sizes has been the student teacher assistant in study halls. A graduate student teaches students only a few years younger than themselves. The instructional abilities would vary in graduate students based on their innate ability to teach. Most graduate students did not have any formal teaching training. In some cases, their ability to speak English was in question. Some students attending the study halls were upset they were being taught by graduate students who may not have the depth of experience as a professor. Other students remained indifferent and stated the responsibility was theirs and would find a way to get by.

Leaving the college campus, the show then went into addressing the economic consequences of the current collegiate system. Of course, the ability of American students and workers to compete against international students was discussed. Most international students are receiving degrees in more demanding majors such as engineering, economics, etc.—majors that translate into high paying and in demand jobs. American students are selecting majors that are less rigorous and still have expectations of achieving high paying jobs. American students' inability to compete is driving the better jobs overseas. Places where the workers have the skills from school to perform the desired tasks.

So if American students are not competitive in the higher end jobs, what about blue collar work? Again, those jobs are going overseas due to lower labor costs. Most American students have a false sense of expectation and privilege due to their parents "success". The world is now a global market place. Students do not realize they are competing for jobs not against their next door neighbor but a worker in India, South Africa, etc. International workers are driven to compete due to the consequences if they do not succeed—poverty for themselves and their family.

The show concluded by not giving any real solutions. All the recommendations of smaller classes, more rigorous standards, more applied and rigorous majors appeared to be beyond the political and economic will of most universities. The show presented that the most important academic push came from Cold War tensions. In order to act the show's recommendations, the political impetus would have to come from Washington and framed in the same national security concerns. However, instead of being direct military conflict the political means would be framed in terms of economic security. Currently, American economic security looks very tenuous given the current product of students its institutions are turning out.

Workers at Dow Chemical

Does the PBS show relevancy hold true? The damaging consequences of an ill-prepared work force from American schools were echoed through out my stay at Dow Chemical.

Dow has an outreach program to local high schools to get students prepared for work at the chemical plant. However, Dow is struggling to find qualified personnel with just the basic math, logic and English skills to perform required tasks.

If Dow does find qualified personnel, some wash out on their lack of work ethic. Some workers would show up 10, 15 minutes late or hours late and believe that it is acceptable and should not be a condition of dismissal. Where were these habits developed? Most were learned in their high school careers and carried over into the work place.

In the more academically demanding positions, the chemical engineers and other technical fields, less and less of these positions are being filled by American students. More qualified students are found overseas and are more willing to travel and are mature enough to handles new situations.

My mentor related her story to me. She stated that she started out with a rigorous college curriculum but struggled. She struggled to the point of dropping out of the chemical engineering program. A Dow employee visited her when she contemplated quitting, encouraging her not to give up. She stated because of that Dow employee's commitment to her, she might not be in the position she is in today. Her story asks the question how many American students have given up on a rigorous curriculum to take an easier path? How will this affect our country and its ability to compete in a world market?

In Dow's engineering department, an engineer expressed concerned about the lack of qualified engineers to take their jobs when they retire. In a society of pre-fabricated products, most students do not get the opportunity to "tinker" and understand how things work. Many did not get to experience the actual building of product, but were regulated to thought experiments evaluated by other individuals and not by the actual forces of nature and practicality.

All the Dow personnel were concerned about America's lack of commitment to traditional industries—like chemicals, steel and other important fabrications. By allowing these industries to move overseas, America is putting itself at risk. America becomes dependent on foreign sources for traditional industries and becomes more of a service economy. The Dow personnel were concerned that in the future there will be no more domestic industries to serve, then where will America be? They have serious reservations about the economic future for their own children. Unless changes occur in both American regulations and attitudes, the Dow personnel see an ever increasing spiral downward for this country.

Trends in Secondary Education

Curriculum Pacing

The new trend in California education is “pacing”. Pacing ensures that all educators are covering the same material at the same time. All the standards are thus met.

The students are then expected to be successful. And if the students are not successful, it must be the teacher’s fault. Of course, there are flaws in this simplistic thinking.

First, if teaching a child was as easy as giving a textbook, a list of topics, and a pacing schedule, the California Department of Education would do it and be done with all this debate. But everyone knows that this is impossible. Students have different abilities, motivations and convictions when it comes to education. What works for one student does not necessarily work for another.

Pacing assumes a homogeneous group progressing through a course. Yet for the past 25 years of education, the policy has been heterogeneous grouping because of the damaging affects of being place in a lower lever group. Does California have the political will to stand up and properly place students according to their academic abilities?

Pacing assumes that every student’s learning curve is the same. Students will achieve competency of the material in 3 to 4 weeks, mastery some time later. If a student cannot learn in this pacing environment, well too bad because it is time to move on. In math, the curriculum requires us to cover an absurd amount of standards and topics. Not really being competent in any of them but exposing students to all of them. Exposure will somehow translate into competency which will somehow become mastery. As some of my colleagues have stated to me, “Well if they do not get it now, they will get it later.”

Let me site a pacing and exposure example. This summer at Dow, I did their online training. In particular, I did a session on how to properly load and unload chemicals into railcars. I learned how to: set the brakes; put the right cards in position; create a vapor-less seal for the connection; etc. After a few hours of reading and memorizing some presented facts, I successfully passed the test on how to load railcars.

Does this mean that I can go out and safely load chemicals into a railcar? No way. I need to go out and physically do the actions. I need someone to supervise and ensure I am doing all the processes correctly. I need that supervision more than just once but multiple times. I need to be re-tested on the course materials after training. I need to be spot checked every now and then to ensure I am not picking up any bad habits.

There is a constant learning curve beyond the pacing of a few weeks. In addition, I cannot just move on if I do not understand something. There are extremely bad consequences if I just move on and do not properly learn the chemical loading of a railcar processes. The responsibility for learning the process adequately is mine.

So why does education assume that it can someway circumvent the above process? There are no shortcuts for learning--everybody learns at their own pace. I did the online

course in an afternoon—others might take longer. I need many repetitions to do a process correctly; others may get it after a few times. The learning process varies.

In addition, in industry, I have inherent motivation for learning the process--both monetary and, in my example, safety. If I screw up I lose my job or in the railcar example, my health or life. In education, there is no external motivation save the student or the expectations of the student's family—which in some cases is also ignored.

In industry, after I have been trained, if I make a mistake it is not necessarily my supervisor's fault. I have individual accountability for my training and my actions. In education, it is easy for the student to blame circumstances around the issue, the teacher, school, etc., instead of themselves.

Are there cases when pacing works? If I have a highly motivated class that wants to learn and is willing to put in the extra time—pacing will work. However, most students have so many different activities occurring, it is nearly impossible to get that consistent commitment. Three years ago, I had a calculus class that was working so well that in addition to teaching second semester calculus, I was able to begin two or three subjects in third semester calculus. I have not had a class like that since. In most of my calculus classes, I am re-teaching topics that should have been understood earlier.

Again, along with motivation, students must arrive to the class well-prepared and not just exposed. I find myself having to re-teach many topics because their previous teacher only gave them a topical treatment of a concept and did not ensure competency.

Pacing assumes there will be failures. School administrations rarely back up high failure rates—unless you have the data to support it. Why? All high schools receive money based on average daily attendance. Students must be physically in class, no more parent/guardian excuses, for the school to receive money from the state. Also, schools are given money based on their graduation rates—a certain graduation percentage is necessary to maintain funding. If a student is failing, the student may decide going to class is a waste of time. Too many of these snowball and the student does not graduate. The school loses money. Unless the school is given some external motivation, pacing goes against all the revenue generating operations.

Another requirement for pacing is semester classes. Most high schools use year-round classes. Reason? Most high school administrations do not want spend two-weeks over the winter vacation creating a school's master schedule. However, if students are to be held accountable for pacing, immediate remediation is necessary. Currently, if a student fails the first semester of an academic class which builds on previous material, the student will fail the second semester. The student will have wasted between 4 to 7 months, the second semester and summer, waiting to re-visit work that was failed.

However, in spite of the above arguments, I believe pacing will be implemented through out California in some form. Administrators want to prove that they know how to “manage” and the public is demanding some kind of understandable framework to

benchmark work attained by students. So if pacing is to become a reality, let me state the necessary pre-conditions and understandings:

- 1) Political acceptance of failure rates of 50% or higher for at least the first 3 or 4 years of implementation. Hopefully, the public will get the message and start demanding more out of their children.
- 2) All classes have clearly defined and realistic academic goals with an expectation of competency, and not just exposure.
- 3) Acceptance that pacing requires students of similar academic ability to be grouped together.
- 4) Teacher commitment to only teach the realistic topics to be covered and not branch out onto tangent topics.
- 5) A standardized test of abilities and knowledge learned for the semester away from the teacher and as a means to pass on to the next semester's work.
- 6) Smaller class sizes so that students can get individual attention.
- 7) An understanding that in spite of all these efforts there will still be students that fail. For these students, alternative curriculums that are not college preparatory will have to be developed and implemented.
- 8) Creation of different high school diplomas categorized by: college prep (and emphasis study); industrial skill; or general all –purpose degree. Each high school diploma is given a set of requirements and courses that must be passed.
- 9) A different way for schools to attain state monies other than just graduation rates.

Pacing, tracking, grouping is going to be the “new” movement of education.

Competency, Exposure & Mastery

Here are my basic definitions of each:

Competency: The student possesses the ability to apply a concept to a practiced situation and maintains a 70% or higher correctness on most problems or the sum of problems to show conceptual knowledge.

Mastery: The student possesses the ability to apply a concept to a practiced situation and maintains a 90% or higher correctness on most problems or the sum of problems to show conceptual knowledge.

Exposure: The student is expected to mimic a problem given by the teacher. The ability to apply the concept to a new situation is not expected. There is regurgitation of the material to some desired percentage.

The debate I am currently dealing with is exposure versus competency. In math education, there are state standards for each math subject level—the state’s wish list. There are generally 25 to 30 standards that a course should achieve. The problem is if you want competency in all of these standards, there is not enough time in a school year to cover all this. If you want just exposure, you can cover all the standards but most students will not be able to apply concepts to new situation—students just narrowly mimic what they have learned. Also, the students do not possess the skill sets necessary to succeed at the next level of math.

In my opinion, the current attitude of pacing tends to promote exposure. I call this teaching style the “spaghetti on the wall” theory. The teacher blasts through a text, at a certain pace, regardless of the student achievement, and at the end hopes that some concepts are learned. If not, the student was exposed to enough concepts so that when the student sees them again, they will learn it easier the second time around. I cannot think of one activity where this is an affective learning method.

I tend to promote a competency style of teaching. I go at a comfortable pace, with definite expectations and deadlines. I do not expect to cover a complete book’s topics, but the topics I do cover the students know very well. I will adjust the pace if the students are picking up and understanding the material. I find that when students gain confidence, then newer concepts take less time to cover. When the students go to another class, I feel my students can adjust to any teaching style and be successful because they had consistent and high expectations in my class.

There is a downside to the competency style of teaching; students that do not take responsibility for their learning will fail. However, these failing students know that failure is their choice and not dictated by absurd pacing requirements. The other downside is administrators tend to get upset at the amount of failures. But, this can be rebuffed by keeping accurate records of student achievement—a simple spreadsheet.

When does mastery occur? When competency is enforced time and time again, the over-achieving student will become that master student. Those few students will progress forward into the more technical fields. In addition, the average student will comprehend the effort and time required to be “good” at a skill. Today, most students do not comprehend that work effort to achieve academic goals.

Why did I define these three definitions of learning? To improve the education system, the state and general public must define what type of learning it wants students to possess. I believe the private sector wants competency. I believe most people want competency. But most people do not want to pay the price that competency requires—hard work, failure and more hard work. Competency requires a sense of self-responsibility that in this litigious society is hard to find. However, if we start to re-emphasize competency without short-cuts in our schools, we might find it starts to penetrate other parts of American society.

Conclusions

There are many more educational issues I could delve into: finding alternative ways to properly fund schools; creating teaching contracts that actually reflect and compensate teachers for their work; school discipline; technology not being the cure-all in education; etc. but this is only a small paper. I wrote this paper to get my thoughts focused on the issues that are immediately going to affect me. As the school year progresses, I am sure more issues will arise that I will deal with.