

Running head: UNDERGRADUATES' VIEWS ON GRADING

Students' Perspectives on the Grading System  
in an Undergraduate Introductory Technology Course

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## Abstract

This study examines students' perspectives on Pass / Fail grading system in an undergraduate introductory technology course in a Mid-western university. Seven students were interviewed. The Pass / Fail system was found to scare some students since there is a risk of having an "F" grade on the transcript, and some felt uncomfortable when there was no middle ground to fall back on. Pass / No record system is preferred. Allowing to retake assessments was reported to be a desirable policy because it induced mastery learning. Mastery grading increased students' confidence with technology and reduced anxiety. Some felt having mastery grading system for all the courses will be a problem because GPA will be useless and they may not be able to use it to compete with others. They had disagreement on grading on a curve. Learning for learning's sake was a novel concept to them because they had been raised to be asked to get ahead. They felt it OK for schools to sort students rather than foster learning. Implications of these themes such as educational accountability and change were discussed. Systems theory was used as a framework to analyze the problem and findings.

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Grades have a tremendous impact in a college student's life. Worries about the possibility of getting a low grade are always on a student's mind under the common practice of assigning letter grades on a curve. These negative feelings become more intense when coupled with anxiety about technology for novice computer learners. From my personal experience both as a student and as an instructor, students experience great humiliation with low grade and are frustrated about the grading system when they get lower grades. Literature on test anxiety has shown that student anxiety is closely associated with competition within the classroom (Pekrun, 1994), which is the immediate result of norm-referenced grading. Studies have also demonstrated that extrinsic incentives such as normative comparisons may induce a performance orientation, as opposed to mastery orientation (Lepper & Henderlong, 2003). Students with performance orientation focus on "appearing competent, even at the expense of further learning," no matter if they are high-achievers or low-achievers.

Although still widely practiced, the disadvantages of norm-referenced grading have been well documented in educational research (Borich & Kubiszyn, 1994). In addition to the negative affective effects it has on some students mentioned above, it fails to consider the differences in the overall performance of different classes, fails to indicate absolute achievement, and the percentage of the students that are assigned to an A grade is arbitrary (e.g. some may assign percent whereas others may assign 10 percent) (Borich & Kubiszyn, 1994). Among these disadvantages, failing to indicate absolute achievement is of great consequence to the accountability of schools and universities, and to their future performance at work.

Alternatively, there is criterion-referenced grading. Instead of grading on a curve, specific criteria (aligned with course objectives) are used to assign grades. In a criterion-referenced system, if letter grades are still assigned, students can get an A as long as they meet the criteria, no matter how many other students also get an A. This is an obvious advantage to students who have less prior knowledge but are willing to work hard. Unlike norm-referenced grading, it is possible to indicate absolute achievement. Borich et. al. (1994) also point out, when they are informed of the differences of all students' performance in different tests, teachers would be able to improve their teaching effectiveness for different sections of the course content under such grading system. In other words, accountability of teachers' instruction could be enhanced.

Pass / Fail grading system is another kind of criterion-referenced systems, which distinguish only acceptable and failing work. Without finer differentiations of the grades, students can focus more on achieving the learning objective, instead of worrying about being labeled a B or C student. Pass / No credit grading systems further assure that students' education, for which they have paid time, money and efforts, will not incur the punishment of having a record of an F grade when they do not meet the criteria.

The policy of allowing students to retake assessments allowing students to try as many times as they need to attain mastery of a subject, is called a "mastery" approach. It can be combined with any of the three criterion-referenced grading systems mentioned above: criterion-referenced system with letter grades, Pass / Fail, and Pass / No Credit. This approach helps to reduce students' anxiety about not performing well during one specific assessment, and focus on the mastery of the knowledge and skills.

The advantages of criterion-referenced grading system mentioned so far may not apply particularly to advanced learners. Not being intellectually challenged greatly affects students'

motivation to learn. Thus allowing students to test out a portion of a course or the entire course seems to be an option for advanced students, though not sufficient by itself. This may prevent the advanced students from becoming bored and wasting their time in class. (Bishop, 2000) points out that many students are “not stimulated to greater effort by the reward of passing” (p. 201). Therefore, a higher level course needs to be provided for students to continue their pursuit of knowledge in the same domain.

Despite its advantages, criterion-referenced grading is not widely practiced. Pass / Fail or Pass / No credit grading systems are “heavily restricted to the number and level of courses to which they apply” (Francis, 1977). Concerns are that lower standards will result from that system, which is a debatable assertion. More recently, the University of California at Santa Cruz reversed from its “narrative evaluation system” (one kind of pass/ no credit system) to letter grades system (Schneider, 2000). Reasons given for this change include difficulty for students to get into graduate schools or the job market due to lack of the common, reductionist label: A or B.

Criterion-referenced grading with letter grades is less likely to be used by instructors due to its potential for giving an A to all the students in a class. This issue is further complicated by the current heated discussion on “grade inflation,” particularly by the American Academy of Arts and Sciences report by Henry Rosovsky, a professor emeritus of economics at Harvard, and Matthew Hartley (Kamber & Biggs, 2002). This has been challenged, though, by scholars such as Alfie Kohn. Kohn has an educator’s point of view vs. that of the economist, Rosovsky. He pointed out, for example, that the professor’s job is not to sort students for employers or graduate schools, but to “offer feedback that will help students learn more skillfully and enthusiastically” (Kohn, 2002).

The research questions addressed in this study are: (1) In such complex context, do students have good experience with the P / F (mastery) grading system of a required technology course? (2) What can be done to improve their experience?

### Theoretical Framework

This complexity view of the world is one of the basic tenets of Systems theory. This theory's proponents maintain that the world is a web of interrelationships, with complex dynamics. Human systems are no exception, and nonlinear cause-effect relationships exist in all of the subsystems including educational systems. Humans create (or form) systems and then their thinking is modeled by them. Therefore, often those who are in favor of letter grades have this opinion because they themselves have been socialized in this way ever since kindergarten. The famous quality management pioneer W. Edwards Deming says, as quoted by Peter Senge, "The forces of destruction begin with the toddlers—a prize for the best Halloween costume, grades in school, gold stars—and on up through the university"(Senge, 2000).

According to Systems theory analysts such as Senge, piecemeal change will not work, because systems law dictates that "The cure can be worse than the disease," "the easy way out usually leads back in," and "cause and effect are not closely related in time and space" (Senge, 1994) .

On the other hand, according to Senge (1994), systems law emphasizes that minute leverage can make tremendous changes. In the case of grading, changing to a mastery grading system will guarantee that graduates' performance will ultimately meet standards, which are supposed to be in line with their job descriptions. Their competence and confidence as a result of mastery grading that they will demonstrate at work may cause the employers to think highly of the program, even in the absence of the "convenience" of having labels of A, or B for students.

This would build excellent reputation, and a benign circle of excellence may come into being. That was exactly what Alverno college did to become one of the best liberal Arts college in U.S. with its innovative assessment system – no grades but performance checking against eight criteria (Mullin, 2001).

### Purpose of study

In light of the theoretical framework of systems theory, I wanted to find out how the picture of complexity is reflected in students' mind during a course's change to a mastery grading system. More specifically, the purpose of this study was to examine students' experience with a technology course with P / F (mastery) grading system and their experience with technology under such a system.

The guiding questions for this study were: What are students' perceptions on the Pass / Fail mastery grading system? What are their perceptions about other grading systems? How does the grading system affect their experience with technology? How do they view the function of schools and universities? What can be done to improve their experience based on what we learn from their perceptions?

### Method

This is a single case study, bounded by students in a one-credit hour technology course required for education majors. A prior three-credit hour technology integration course for pre-service teacher at a mid-western university has recently been changed to a series of three one-credit courses, taught over three semesters and integrated with other teacher education courses. One of the major reasons for this change was the negative feedback about the graduates' performance from the employers, which resulted from one of the weaknesses of norm-referenced

grading: not being able to indicate absolute achievement. The previous three-credit course used letter grades. The decision to use criterion or norm-referenced grading lied in the hands of individual instructors. The course covered introductory to intermediate level computer skills and technology integration content. In the new course, the first one in the series is an introductory level course on computer skills. The second and third courses in the series are integrated with method courses, and focus on technology integration and fieldwork. This study was conducted on the first course. There are five assessments done for the course. The grading system is a Pass / Fail system, in that those P and F grades are what can be shown on the transcript as required by the university. To a certain extent it is also a mastery grading system because students are allowed to take the assessments as many times as they need to pass them. They can also take them any time they want, though there is deadline for each assessment and they must be taken in the right sequence. If the assessments are well designed, the program can assure that the graduates who pass the course can perform competently at their work.

In terms of identifying participants, I used a purposeful sampling to achieve a maximum variation of gender, grade-level, and experience with technology. A convenience sampling (those who responded to a request to participants by the author) of seven students were chosen and invited to participate in the study. Three were male and four were female students. Three were juniors and four were freshmen. Two of them did not have much experience with technology. Each of them were individually interviewed for around one hour (50 to 70 minutes). All of the interviews were audio-recorded and transcribed. Instead of refraining from getting involved in the narrative of the participants, I intentionally tried to improve rapport with them by joining the discussion, thinking together with them, especially on topics they were not familiar with, and so seemed confused and felt that they had nothing to contribute. I used a tone that was very

tentative, low-pitch, self-talk-like, just to provide a base point that could interact with any of their fleeting thoughts, so that they could elaborate on them.

## Results

I used constant comparative method (Merriam, 1998) to analyze the data. After the first interview, the recorded audio was transcribed into text and the answers to each question was put into a row labeled with that question in Microsoft Excel computer program. Then I inserted a “comment” column and jot down my thoughts as they came into my mind. I repeated this procedure with the second interview, and I created categories in a new file when I found similar comments for the two interviews. These categories together with those derived from combined interview questions evolved into the following themes about their different perspectives on failing, (Pass / Fail) mastery grading, norm-referenced grading, anxiety, GPA, competition, and functions of schools and universities.

### *Scare of "failing"*

Despite of the basic level of the content of the course which the students acknowledged, two of them mentioned that the Pass / Fail grading system at first sounded scary to them. Rachel\* said, " At first, it kind of scared me, because it's pass or fail, all or nothing." Kate said when she first heard the course's Pass / Fail grading system, she felt it was "kind of scary," but was relieved after knowing of its content and that she could take the assessments many times. Another student raised the issue of discouraging some students by "failing" them when they do grow a lot in a semester but still do not meet the criteria.

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\* Pseudonyms as are all names of participants in the study.

*Retaking assessments: mastery grading*

As evident in Kate's case, being allowed to retake the assessments can ease anxiety that is associated with failing. Most of the students that participated in the interview agreed, at least conditionally, that it was "nice" to have the chance to retake the assessments, which is not a common practice at all in college or high school. Mark's comments revealed that he values mastery of skills and authentic learning goals: "...in the real world, you will have assistance from others (anyway)." Quite a few of the students mentioned that "more efforts are rewarded" with this policy. Another important benefit, according to Cindy, was that ambiguous and misleading portions of the assessments could be clarified and would not be counted against the students' grades. It is good also because "it shows that the teacher really cares about you learn it." Zalman also pointed out that being able to take the assessment again would help if the student is physically uncomfortable the day s/he takes the assessment.

Some participants felt that certain conditions should be added to this policy. They offered great insight on the nature of the tested skills, including: "change the test items each time," so that the students can show they really mastered the concept and procedure, rather than simple "memorization." (The course instructors were aware of this problem, and building a pool of test items was already part of the plan for assessment modification.) Some participants believed that there should be a maximum number of times to repeat each assessment to "give students some pressure." Mike commented, "some students may do it on Sunday night and think if they mess up, they can always redo it --- they won't take it seriously."

Some participants thought being allowed repeat attempts on assessments was fair for a one-credit class but not for three-credit class, and fair for courses that use Pass / Fail grading system, but not for courses that use A through F grades. If used in those courses, Ashley

suggested, "the higher grade you get the second time should go down because you didn't get that high the first time." She claimed that this was why the "smarter students" didn't like repeated assessments: "it let other students to slack off a little bit and (they are) given more chances."

And when retaking assessment is used in courses with A through F grades, there will be possibilities that everyone could eventually get an A if he or she wants it. The participants reactions to this varied too. Rachel thought "it takes away motivation to try if everyone can get an A," i.e., there's no competition with others. At the same time she felt "it is more of competing against oneself," and "it is fair to be graded on efforts rather than natural ability."

Others expressed their disinterest in other students' grades through statements such as "I don't worry about other people's grade," "as long as I pass and I don't mind if someone also passes and I know more than her," or "personally I wouldn't mind if I can get an A myself."

Kate elaborated further:

...that's really good, I want to be a teacher myself; all the students don't learn at the same pace; take them longer or take two tries - as long as they learn it, fine...my friend is one of the smarter kids who think it's unfair, because other kids procrastinate, she spent all the time studying and gets an A in the test, but other kids may very well have studied as long as her, but she doesn't realize...I guess the smarter kids are not just very understanding, feel like I can get it done in a day, why can't you learn it...they don't understand how someone took longer and still got the same grade and they take less time...

There were also opinions that fall in between Kate and her classmate. Ashley said:

...in certain classes, I would like it; in those I thought I'm just Ok, I would like everyone can get an A; in other classes, I want it to be more competitive...

While some students wanted to limit the number of tries a student can take on an assessment, others experienced great frustrations about retaking assessments many times, even if they were allowed to retake it as many times as they needed. Cindy reflected:

...it's frustrating when you have to come back again and again and when you fail. Especially when you have another class right after that. You expect it to finish in a hour, but it's not done after two hours, it's frustrating. I don't want to come back on the next day, because it will take me another two hours of the day (including commuting, etc.) just to fix a minor point in the assessment.

It seems it entails great patience and perseverance (not to mention the amount of time invested) for a student to retake a test, even in the absence of the worry that they have a limited number of times to pass. It is also worth noting that despite of these inconveniences, many of them seemed to still prefer this policy to the alternative. As Mike put it, "...retaking many times was frustrating, but still better than getting a D without other chances."

### *Confidence and anxiety*

Some of the participants agreed that P/F mastery grading was helpful to their confidence with mastering of the content of the course. Being informed of objectives about the skills they needed to master, with which the assessments were aligned, was cited as the major reason for

their confidence. Rachel said, "I've got more confidence, just because the general guideline for what is expected is laid out, and I know that I'm OK, and I can do this thing." Mark had a different rationale:

In P/F if you pass, you did just as good as elites, while in A, B, C, you get a C, there are still students who get an A --- you didn't do as well. So maybe content-levelwise, you mentally think you did as well. P/F is better if there are specific criteria and students do more; but if the criteria are low, it would be easier.

However, other students' response disagreed with Mark's opinion. They felt that courses with A through F grades let them "try harder, to be perfect," and could show "how well" they did, but they found P/F could also do that, as is evident in Kate's remarks:

I guess I would feel more confident about getting an A, it's so much higher than other grades. P/F, you can't really tell – it (pass) is higher than fail ... you didn't fail ... you don't know how well you did, but...it's basically like getting an A too, because you passed and you learned everything.

When asked if the mastery grading system can decrease anxiety about testing and technology, all of the participants responded with "Yes!" Some attributed this to the policy of allowing students to retake assessments so they had "more chances" to succeed. Mike said, "...definitely...it gets off the pressure of getting it wrong with more chances." Some pointed to the fact that learners "don't have to worry about grades." Interestingly, two female students commented that this system would definitely help "my parents! The way they learn and the way

you teach is good; take enough time on the assessments and take many times, so it would be good for someone who is not familiar with technology.” On the other hand, Cindy raised the issue of frustration for coming back again and again when failing, as quoted above.

### *Grading on a curve*

In a Spanish class at this university, the teacher took off some points on my paper. I said "What's wrong with the paper?" "Nothing is wrong with the paper, just not as good as some." "Did I miss anything?" "No."  
"O..OK." (Kate)

Like Kate, five of the interviewed students thought grading on a curve (norm-referenced grading) was not fair, while two reported they were comfortable with that. Although people usually associate success based on norm-referenced grading with intelligence (at least the intelligence in the specific subject, if not general intelligence), it may well have more to do with prior knowledge, especially in subjects related to technology. Four of the them did think grading based on prior knowledge was unfair, though, but used different rationale. Ashley pointed to the differences in efforts different students put into the course. Zalman pointed to the uniqueness of the issue of access to computers, so grading on prior knowledge would be unfair, whereas he thought it was Okay for other courses.

### *P/F mastery grading for all courses*

When asked if they were comfortable with using Pass / Fail mastery grading system for all the courses in the university, the participants posed many problems regarding this approach. “Motivation will go down, you can't get an A or worry about GPA, you only need to pass,”

Zalman said, "... a lot less pressure at least for me, because I know I can pass, I won't fail a course, but I don't have to get an A." Some found it was a problem to have no middle ground to fall back on. Cindy said, "some students may not like it because they may be happy with a C in other courses, but they don't have that option in this system. You have to pass it." Mark pointed out people need distinction: "... (for example) internship, they need to select the elite students." He also came up with a modified version of the Pass / Fail system: "... you may have Pass and indicate how many tries the students did."

Some students found it difficult to use Pass / Fail system with certain courses. "I don't see how you can use P/F with creativity," Cindy raised her doubt. Mike also commented, "computer and math courses are ok, but not OK for courses which require reading and paper." When I probed on how those courses were traditionally graded, he admitted that letter grades were just based on teacher's opinion, but he still felt that was the way it should be.

However, Ashley was very excited about using the Pass / Fail mastery grading system:

It is interesting...it's definitely interesting, it will totally change everything...if all the courses are like this...Wow...I think it's fair...everything will have to change...so many things are focused on GPA, if you are in top 10% of the class, you get so many things...your grades are so important, my parents...you have to get your GPA...but now everything is just ...you got it and...I don't know...everything will be different .it will be neat...you will see people would take higher level courses to boast their intelligence...'Oh I have 4.0 GPA' , but maybe they are just taking basic classes...but now 'look, I've mastered Calculus 7' or...(laugh) you know...that would definitely push people take more

challenging classes...in my high school, I didn't take physics because I was afraid it would hurt my GPA...so you would definitely see people taking more classes...that is a neat system...

### *GPA*

Three participants thought GPA was a good measure, or at least a necessary one. Mike admitted that “getting super competitive is a bad thing,” but “there must be a scale to measure students,” and with the P/F system, “some students may just get pass around the border.” He believed that people's effort should be rewarded with grades. Zalman agreed, and also pointed out that people care about GPA because “they need it for looking for jobs...” More specifically, he mentioned that GPA is good for students who do not have social connections like him. That's the only thing they can rely on to get ahead and find a job. Then he admitted that maybe P/F is good for those who get lower GPA and don't have connections...

Ashley even regarded it as “the best way to measure,” especially compared with standardized tests.

...my GPA turned out to be better than SAT. Some people freak on tests, but GPA is over a course of many years and factored into so many things; if they consistently get A's in all the courses, that means they worked really hard. Nowadays in high school everything is so concentrated on standardized tests. It's too much...

Interestingly, Kate had the just opposite opinion:

I had good GPA in high school, but I don't think it is equivalent to my actual knowledge... it's based on (if not so in college, but in high school)...if you studied, you get a good grade, and you may forget it right after; there are a lot of smart kids, but did not have motivation to do well in class, they wouldn't care; their parents wouldn't care; I don't like GPA, but I like more the standardized tests and that kind of thing...

Others also thought GPA could not evaluate a student's overall performance, and most interestingly, Mike also raised the issue that GPA may prevent students from taking more challenging courses, as Ashley did in the previous section.

Since P/F courses cannot make a contribution to boost GPA, the perception of the course was affected. Rachel gave a very good description of issue: "I think it's way down. I guess it is the most important class I take, honestly, because it is so fundamental, but it makes it seem very unimportant..." People usually assume that P/F class is easier and thus unimportant, which is probably true in many existing cases, but Mark put forward the question: "Is C the pass or is A the pass?" A P of one hundred percent mastery can certainly be more demanding than a B or C.

On the same issue of relationship of P/F courses and GPA, Kate offered a blunter note:

I don't think you would need GPA...if all classes are like this...you just pass them all...just take all the courses...

### *Competition*

P/F mastery grading system seems to have eliminated competition and thus the motivation for many students. As quoted previously, Rachel felt no motivation to try if everyone could pass or get an A:

If everybody gets an A and then A becomes average and it's not even really like A any more, it's not worth it ... if A is the top notch that's just automatically what you strive for ...

At the same time she felt "it is more of competing against oneself... just seeing like how high you can make yourself go..."

Toward the end of the interview, Rachel's thoughts on competition seemed to become a little clearer, realizing that competing against oneself to achieve mastery was not a bad alternative to competing against peers, or maybe a better one:

I think there's the part of me that would be stuck on, like, I want to get a 4.0, that part of me, but that's just the part of me that I was raised with...but I think that the mastery makes more sense...it would be going out to the world, leaving the class and knowing that you've mastered it vs. getting a C, there's a whole lot that you can still not know, and yet you can move on to the next...I think the mastery is much better...

During our discussion, Ashley was also close to finding out different kinds of competitions:

Ming: But let's compare what you said just now that you want to take A, B, C courses because they are more competitive...

Ashley: Wow...yeah, that's more competitive, but if you push the (P/F) courses to be more competitive rather A, B, C's competitive...

On the other hand, they were also aware of the fact that the real world has competition. Students need to find jobs. Can it be done without GPA? Rachel pondered,

That's tough...eventually if everyone passes, why choose this person over that one, what sets you ahead...

Another question is, can we prepare students well enough for the competition in society without exposing them to it at school or university?

*Function of schools and universities: sorting or fostering learning*

The competition within school and university is the mechanism of the sorting function they perform in our social system, although fostering learning has always been the professed function. A through F grades and GPA are the specific form it takes to differentiate students. Is it fair for school to sort students, given the fact that they are paid by the parents directly or indirectly to provide education for their children? "Since it has always been that way, I think it's fair..." said Ashley, "I think it's OK for school to sort us.." Mike came up with another rationale: "...school sorting students are OK because students will eventually choose those courses they are good at. They won't keep taking those courses that they get lower grades." The sorting function of university gives the instructor great power by assigning grades to students. The set-up of this course seemed to differ from the traditional dynamic, in that the students could pass

the assessments by any instructor in the lab grading on the common rubrics, instead of under control of a single instructor.

However, most of the participant students seemed to find having different instructors grading their assessments somewhat uncomfortable. Knowing the instructor in person seemed to mean a lot to almost all of them. Rachel said, "I would rather just have one instructor and they know me personally, and know what I'm capable of ... " On the other hand, they admitted that it was less a problem for courses with Pass / Fail grading system and courses that "objective" grading is possible, than courses with letter grades and courses involved with creativity.

Nevertheless, some students did agree that it may help if for some reason one did not get along with the primary instructor and she or he would still have chances to pass the course. It was worth noting that one student felt it was good but for a different reason: "...different instructor can teach in different ways when giving feedback after the assessments."

### Conclusion

This study is a case study, so readers may use their own judgment case from the detailed descriptions in this article to decide if the results relate to their own situations. Admitting these narratives only reflect seven individuals in this course, I still offer some tentative conclusions:

#### *Pass / No Record is preferred to Pass / Fail*

It is evident that the word "fail" has strong negative connotation in students' mind, not to mention that it may have serious real consequences. Therefore "Pass / Fail" system had better be replaced by "Pass / No credit", or even "Pass / No record" system if possible. The "Pass" grade may also be accompanied by brief description of the core skills (inventory) that students have acquired. The students have already spent their time and money on a course, how could the

university be entitled to punish them by maintaining a stigmatizing record? No failing / punishing at school any more! But the problem is the university system is very difficult to change in a short period of time, so the alternative way is to ensure communicating to the students that letting everyone pass is the instructor's goal.

*Allowing to retake assessments is a desirable policy*

Letting students retake assessment to achieve mastery seems to be the right way to go. Mastery grading boosts confidence and reduces anxiety. Some participants wanted to drop a limit on the number of times for tries; others wanted to downgrade the grade for one's second try in courses with letter grades. Both opinions reflect the "competition with peers" mentality, and they are not aware of the frustrations with retaking assessments even if there is no limit of tries.

The frustrations may suggest that more practice items are needed to make students ready to pass the assessments before they take it. Feedback should be provided for the practice items and finished products should be given to them so that they can compare with their own.

*Need middle ground to fall back on?*

Although many participants had this concern, I would guess wanting to get a B or C rather than mastering the content is a forced choice under current system. Partial mastery is obviously not as satisfactory as complete mastery. Having letter grades may let the instructor not take sufficient responsibility for the students' learning. It may also help to check students' schedule to make sure they are not taking too many classes at the same time.

*Schools and universities should make themselves accountable for students' learning*

One simple reason is they are paid by parents or students directly or indirectly (through tax), or by the government. Some may challenge that no learning could be accomplished without

the active participation or responsibility of the learner. The participant students also have assumptions that students need some pressure, which indicates that their study relies on extrinsic motivation: getting ahead or not being left behind. Some of them think that some students “deserve a C”. But learning is the most rewarding undertaking for people, not to mention they are paying for this, so why wouldn't they want to participate? The current system is standing in the way, because it affects their motivation by pitting them against one another rather than let them focus on progress of their own learning. Competition should be encouraged among universities, not among students. In the perfect world, they as customers should be entitled to choose different institutions to reach their goal, based on their price, service quality and efficiency.

Therefore, schools and universities are not supposed to sort students. Having competition in school may not prepare the students for the competition in society; it makes them care too much of the result. Some of them may boost fake confidence (e.g. telling themselves to the mirror "I'm very smart; I'm very cool") and some of them may simply give up. On the other hand, fostering intrinsic motivation by using mastery grading (competing against self vs. others) may better prepare students for competition - they do not view losing in a competition as failure, but as the most common process in learning, i.e. error as in "trial and error" - the basic way of learning. They focus on the growth of the self, not on the ego. Another thing is, in real life, there are too many factors that can contribute to the success or failure of an individual. One is not hired, maybe because s/he asks for higher salary rather than s/he has less skills. Therefore, it seems to make a lot more sense and healthier to focus on self growth rather than getting ahead of others, even in the context of competition.

Also research has shown that homeschooling students are more confident in college. This means they are better prepared after intrinsic motivation has been developed before college, so we can do the same thing in college and they will be better prepared in the real world. Some training on competition may still be necessary, but not in the form of grades, which stay in the way of the mastery of the skills and forfeit the accountability of the university. Differences in grades and GPA are also usually fixed and difficult for students to improve in a time-based education system, whereas their success chances in the real world (e.g. job seeking) are relatively more fluid due to a myriad of factors.

If education system changes to be competency-based vs. time-based (Reigeluth, 2003, personal communication), the students can easily be differentiated by employers because they may acquire different skills at a certain time.

*Education and certification should be separated*

The fact that schools and universities perform both instructional and certifying functions dictates that people view the outcome of education as mainly the students' responsibility, and that accountability is difficult to be realized. Francis (1977) points out that "until education's social function of certification is handled by some agency other than the college or university, the traditional methods of grading will remain." A system similar to what Bishop (2000) proposed for K-12 context --"Curriculum-based External Exit Exam Systems" may be helpful. The exam may only assess the highest level skills and may take the form of portfolio, etc.

The separation of instruction and assessment in this course was a minor step towards that direction, although the participant students did not see much value in that. Students concerns about personal relationship with the instructor seemed to have much to do with the fact that the

current assessment might still “fail” them. And this separation of instruction and assessment seems to be the best a program can do under the current system to improve the accountability of teaching.

*Make changes happen*

How can we make changes happen? What Rachel said is very true: “It’s huge to change,” and “it won’t work without changing everything.”

First and foremost, people’s mindset needs to be changed. Data from the interviews confirm the notion of systems theory that the system that people live in frames people's thinking. There are many statements illustrating this: “Since it has always been that way, I think it's fair (for school to sort students)...” “The inventory grading system in theory it's definitely better, but I don't how it would work, because I've never seen a system like, it has always been that way...” and “I think there’s the part of me that would be stuck on, like, I want to get a 4.0, that part of me, but there’s just the part of me that I was raised with...” After Ashley gave the example of norm-referenced grading (cited previously), I asked her,

Ming: You wouldn't do that when you become a teacher, right? (smile)

Ashley: Probably...

Ming: What? (smile in surprise)

Ashley: I...I don't know! (laugh in confusion)

There are many other issues such as raising instructor’s salary and rewarding professors for teaching to the same extent as for research. Senge (2000) addresses many complex issues and rests hope on department chairs. But as an instructor without a department chair initiating large-

scale change, there are still many things s/he can try. Having the whole system and its dynamics in mind, we need to find a leverage. In line with Mullin (2001), assessment seems to be a workable point to get started. As mentioned above, if we cannot change the grading system of the university for now, we can start from a course or a class by virtually converting P/F to P only if we could work hard enough on individual communication with students. If we cannot change the letter grades system, at least we could make it a mastery system by allowing students retake their assignments. As long as we are determined to improve our accountability, the sky is the limit!

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