

Successful Students Do Not Do What They Should: An Inspirational Seminar for the Classroom

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Abstract

Most engineering instructors are encouraged to achieve teaching excellence. But how can instructors encourage students to achieve learning excellence? This seminar can easily be used by any instructor, in any course, to motivate students to undertake successful learning strategies. This paper outlines and gives the rationale behind a presentation that can be found at <http://www.enel.ucalgary.ca/People/Macnab/howToExcel.ppt>. Any interested professors can give this 50-minute presentation to their class, or use this paper as inspiration to create their own seminar.

Introduction

How can students find success and excel in university? The answer would at first appear to be of interest mainly to students. However, successful students cause less work for instructors and administrators. Successful students are also the ones who make the teaching experience enjoyable and rewarding for professors. But few students, left to their own devices, will acquire the skills they need to do this. Why not help them out a little? It is true there are many resources available to students, such as books on study skills [4, 6, 7, 8] and books on learning styles [3]. It is also true that very few students will investigate them without some inspiration.

Students easily fall into patterns of behavior that prevent them from acquiring new skills. Students who do not think critically about their actions will simply do what they think they should do. In the students' past teachers and parents have given expectations to them on school attendance and study habits. Rather than explaining the rationale behind such expectations, too often enforcement is the only consideration. The typical methods for enforcing expectations are guilt (European-descended cultures) and shame (the rest of the world). The most common expression of expectations come in the form "You should" (act in a certain way). Many students end up with a set of imaginary rules in their heads on how to attend school. For the purposes of this paper the following definition is provided:

Definition An *imaginary rule* has no consequence for breaking the rule other than guilt or shame.

Regardless of which expectations are helpful for student learning and which are not, students

tend to bring these beliefs into university because no one has told them anything different. Although some habits may indeed help students pass courses in the absence of anything better, most habits hinder their learning and prevent them from excelling. Only once students are convinced it is acceptable not to follow imaginary rules will they be free to acquire new skills. The behavior that results from eliminating imaginary rules is referred to as *assertive behavior* [9] (or simply *assertiveness*). Note that the widespread use of the word assertiveness to mean “aggressive confidence” is not the meaning used in this paper. For the purposes of this paper the following definitions are provided:

Definition *Assertive thought* is the ability to identify a goal and think critically about what actions will accomplish that goal.

Definition *Unassertive thought* is the absence of critical thought about actions stemming from the belief that people should behave in certain ways.

Students require a very different skill set in university than in secondary school. Engineering students are often left to their own devices to appreciate this and to acquire these new skills; in the past universities used high failure rates to eliminate students who did not. In contrast, contemporary engineering educational practice emphasizes student retention. This has been achieved using a variety of methods from improved teaching to grade inflation. Typically, these methods implicitly assume that students have not acquired, and may not acquire, the appropriate skills.

Some have already reported success in explicitly teaching engineering students useful study skills [5, 11, 10, 1, 2]. However, an individual professor is typically not in the position to implement a complete study program for her or his students. Typically, the instructor is limited to sharing hints, tricks, and reminders during lectures which are often ignored by students. The seminar outlined in this paper is suggested for use as an introductory lecture to a course, to inspire them to take an interest in their own learning. Many students have reported that this seminar gave them a completely different outlook on university and lead to a more satisfying and successful education, including improved grades.

How to Excel in Engineering at University

a seminar by Dr. Chris Macnab

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Outline of presentation

This seminar will not solve all the students' problems, but it will get them thinking about what they have never before considered. It first and foremost tries to convince students that new skills are indeed necessary, and warns them that simply repeating the techniques that lead to success in high school will not work in university. It gives students permission to take charge of their own education. It encourages students to try different study techniques than they have used in the past to try and find out what will actually work for them. Also, some concrete study techniques are outlined that have worked for many students. Finally, a brief assessment of how university skills will be valuable as practicing engineers is presented as further motivation.

Legal rights teenagers do not have

High school students, or *teenagers*, do not enjoy a full range of legal rights. The age at which there is a transition in legal status from child to adult varies in different jurisdictions. Most students, however, will begin high school as a legal child and finish university as a legal adult. Adults enjoy many significant legal rights in a free country that children do not.

Legal right for adults

- the right to vote
- the right to drink alcohol
- the right to work anywhere
- the right to live anywhere
- the right to get married
- full access to the justice system

The magnitude of this change is lost on many students. For instance, the justice system may have been inaccessible in high school if the principal handled discipline around physical assaults. In university, it may not occur to students to phone police if they are assaulted. University students can easily take several years before they exercise most of their legal rights as adults. They are still following hold habits, perhaps because no one has explicitly told them they are now free from former restrictions.

Rules teenagers must follow

Without the legal status of an adult, teenagers are subject to the rules of parents. Students may or may not be free of these rules once they are in university. With the increased cost of post-secondary education, parents often hold the purse strings and provide living space. These parents may still instruct adult children to follow their rules. Thus, students who live with their parents are even less likely than others to comprehend their new freedoms at university.

Relative to typical adult environments, high school has a lot of rules. These kinds of rules do not exist at university. There is no longer disciplinary consequences if one does not follow them. Students who follow these kinds of rules in university typically do so because they think they should. The rules they follow are imaginary.

Rules given by parents	Rules in high school
<ul style="list-style-type: none"> ● have to live at home with parents ● not permitted to stay out all night ● have to let parents know where they are ● have to do some kind of household chore ● have to go to school every day ● cannot have partner stay overnight 	<ul style="list-style-type: none"> ● have to go to school every day ● cannot skip classes ● have to do the assigned homework ● have to give textbooks back at the end of the year ● cannot eat in class ● have to raise a hand to talk ● have to ask to go to the bathroom

Imaginary rules in university

After graduating high school, students are free of many rules. They acquire many rights. But students have been so used to not having these rights that they have trouble asserting them, or even realizing they have them.

The list of habits carried over into university is not limited to those explicitly defined rules from high school. Although good teachers will give solid reasons for expectations, many high school teachers provide quite a number of expectations in the form of shoulds. Also, a student's own self-identity can be wrapped up in a set of shoulds. They think they should feel a certain way or else they are not good enough.

How students feel they should act	How students feel they should be
<ul style="list-style-type: none"> ● should do all assignments ● should go to all classes ● should write down everything in class ● should learn in class ● should read all assigned readings ● should read the textbooks ● should study from notes and textbooks ● should work hard ● should do the same things as other students 	<ul style="list-style-type: none"> ● should understand everything ● should know everything ● shouldn't make mistakes ● should get good marks ● should care about their classes ● should be hard workers

You may be asking, "What is wrong with that?" Indeed, it is because these shoulds seem to make the job of professors easier that they are seldom challenged by professors. Most people will be

quite happy to see someone else follow a code of behavior. But keep in mind that these are only habits for such students. The students are not actively participating in their own learning process. Because university rewards learning, students who rigidly follow these kinds of imaginary rules will find themselves unrewarded for their efforts. They will not be successful in university and they will not understand why. This in turn leads to frustration which does not, in fact, make the professor's job any easier or more enjoyable.

If I want to, then I need to ...

The motivation behind behaviors is all-important. The actions resulting from the imaginary rules in the previous section would seem to be desirable. However, they must come from a good reason for them to have beneficial effect. What is a good reason? Presumably the purpose of going to university is to learn. Certainly, learning is directly rewarded through grades. The learning in university is not limited to course content, but also includes thinking skills picked up along the way. Thus the objective is for students to replace any

“I should _____”

thought with an

“If I want to learn, I must _____.”

For example, let's replace “I should do all of my assignments” with “If I want to learn, I need to do my assignments.” What will the change in actually behavior be? If students think they should do assignments, they will sit down at an assignment working from beginning toward the end until it's all completed (and if not they will feel guilty). There is no room to prioritize or utilize time management skills and, ironically, another assignment may not get done because of it. There is no opportunity to further explore something that is interesting. There is great temptation to get help or copy from other students if a question is difficult. Tests will naturally be written in the same way, with no utilization of test-writing strategies.

If we don't should on ourselves

- We can prioritize our workloads and utilize time management skills
- We can develop strategies for:
 - lectures
 - assignments
 - tests
- We can make decisions for ourselves and act instead of reacting to what other people do to us

After the thought has been replaced, students are free to schedule the time in relation to their

other course work, go exploring an interesting variation or idea, and will not be tempted to copy. They will not feel guilty or stressed if they do not finish the assignment. The amount of learning they do will be far greater and they will have full control over their time management. They will feel free to use test-writing strategies, like reading over tests at the beginning and prioritizing questions. The ability to prioritize and make their own decisions on what they will do and learn will directly translate into less stress and higher marks.

Universal rights

The replacement of shoulds is greatly beneficial, but it is far from trivial. Essentially you are asking the students to abandon a belief system. In order for people to have the ability to set goals, they must realize they have the right to set goals for themselves. Such a belief system is referred to as *assertive rights* [9]. In the context of university, these kind of rights can be made more specific.

Not all students will be convinced they have these rights. In fact, some will view these as so radical that incorporating them would immediately place them out of the bounds of civilized society. It must be pointed out to students that society actually rewards people who base their actions on such beliefs. People who are stuck doing what they think they should are simply being taken advantage of by others. For those students who are ready to accept these rights the rest of the presentation will be an uplifting experience.

Universal rights	Student rights in university
<ul style="list-style-type: none"> ● we have the right to make mistakes ● we have the right to not understand something ● we have the right to be wrong ● we have the right to be illogical ● we have the right not to care ● we have the right not to please others ● we have the right to set our own goals ● we have the right to decide what will best accomplish our goals ● we have the right to decide what is best for ourselves 	<p>the right to decide:</p> <ul style="list-style-type: none"> ● what program/classes they will take ● how much of the assignments they will do ● when to go to class ● what notes to take ● what to study ● when to study ● what marks they will be satisfied with

Invariably, people translate “You have the right not to care” as “Don’t care about anything.” People think they are being advised to be selfish and uncaring people. It is important to emphasize that this is not the case and “You have the right not to care” just means “You make the choices on what you will care about.”

Doormats are not caring and helpful

- it is great to care about things
- you decide what things you will care about
- doing what people say you should is not the same as caring about them
- doing what people say you should is not the same as helping them
- if you want to help other people, set that as a goal and think about how you will accomplish that

Some students are inherently miserable because they have picked the degree program they thought they should. But for most students, recognition of these rights will immediately make their lives in university less stressful and more enjoyable.

You should teach better

Students also have expectations and are perhaps even more likely than professors to phrase them in terms of shoulds. I have read countless teaching evaluation comment sheets that started “The professor should have ...” Most often these expectations are based on how high school teachers acted. In fact, eliminating these shoulds on teaching evaluations was the original intent in the creation of this seminar.

How students think professors should act

- they should explain all the material
- they should give lots of examples
- they should follow the textbook
- they shouldn't follow the textbook
- they should be hard workers
- they should return marks quickly
- they should mark tests leniently
- they shouldn't make mistakes

Many professors are quite aware of these expectations of the students, and attempt to follow them in a quest for good teaching evaluations. However, this is most unrewarding. Assertive thought is also helpful for professors! It is the easiest way to really enjoy teaching. Also, assertiveness on the part of the professor is actually appreciated by the students.

Study habits

Too often study habits are just habits, and have no rational behind them. How can students identify when that is the case? Students can examine the following behaviors to see if they have actually just been following imaginary rules. Common pitfalls for students come from not having given any thought to why they do things.

Student pitfalls	More student pitfalls
<ul style="list-style-type: none">● approaching classes with fear● spending too much time on some assignments● running out of time to do other assignments● trying to get on each professor's good side● trying to do everything in a course● expecting the professor to know them● fearing the professor● fearing hard courses● stressing out when a test is difficult● taking it easy when a test is easy● "Why can't everyone get an A?"	<ul style="list-style-type: none">● not working on assignments independently (copying)● cheating on tests● getting other people to do the work in the labs● worrying about marks instead of learning● doing assignments for the marks and not for the learning● trying to be perfect● trying to understand everything immediately● never writing anything down that might be wrong

There are always a certain (hopefully small) percentage of students who cheat. These students are under the illusion that the degree alone will be a ticket through life regardless of how they got it. At this point, it is best to really emphasize how these students are hurting themselves. Employers do not ask people what their marks were in university, and often do not even care what the degree was. The benefit of university is to develop a whole host of skills and knowledge. These will be used by people as they take on new and challenging jobs. How will students who cheated their way through university be able to cope? They will not be able to without developing those skills from scratch. It is more difficult to develop skills on the job. In fact, some people are not able to develop these skills during their career. Such a career is often characterized by lack of promotions and long periods of unemployment between jobs. Have fun cheaters!

The Dummies Guide to Enjoying University

There are some easy ways to change stressed students into happy students. Stressed students are those who often worry about their marks, work all the time, are tired, and hate the material they are learning.

Happy students	Stressed students
<ul style="list-style-type: none"> ● want to learn ● work and play ● alert ● enjoy the material 	<ul style="list-style-type: none"> ● worried about marks ● work all the time ● tired ● hate the material

Happy students are those who want to learn, find balance between work and play, are alert, enjoy what they are learning. Some things can be done to immediately improve the university experience and grades that do not require any particular skill. Some things just require a change in approach.

Do's	Don'ts
<ul style="list-style-type: none"> ● reading ahead in the text ● reviewing previous notes before class ● setting aside a certain number of hours to attempt an assignment ● seeing the professor for help in improve basic understanding ● taking time to understanding things ● deciding which lectures to miss ● studying for tests by practicing questions ● realizing a mark is only relative to other's marks ● keeping notes ● keeping core textbooks ● hiring a math tutor if failing ● reading popular technical books and magazines ● having a technical hobby 	<ul style="list-style-type: none"> ● never reading ahead in the text ● leaving all previous notes at home ● doing assignment questions in order until finished ● seeing the professor the day before the test to try and get some hints ● trying to understand everything now ● going to every single lecture ● studying for tests by reading and memorizing ● relaxing in an easy course ● working hard in a difficult course ● throwing out all notes ● selling all textbooks ● refusing to relearn high-school math ● never reading about or experience technology outside of the classroom

The important notion is really to try something different from the old habits to see what really works. What really works will vary from class to class and will depend on how a professor gives a course. What really works will also vary from student to student since people have different learning styles.

The Advanced Guide to Enjoying University

Some study skills are quite valuable for improving grades. Most students think their job in a lecture is to simply write down everything the professor does. It is a real skill to know when it is

important to write and when it is important to listen.

It is amazing how many engineering students think they will actually learn mathematical equations simply by viewing them in a text or their notes. Pointing out to student that they must try out the math for themselves while reading or studying is essential. Some of these skills take some time to develop.

Important skills	How to develop skills
<ul style="list-style-type: none">● learning from a lecture● learning from a textbook● learning from notes● test-studying and test-writing strategies● problem solving● research (texts,notes,old exams, library,internet)	<ul style="list-style-type: none">● trying to develop study skills● working independently● identifying learning style● reading books on how to study and learn

Half the battle is simply realizing that study skills are lacking and must be developed. Just trying to develop them independently will make an enormous difference. However, there are numerous resources available at the local bookstore, the library, and the internet. Giving students a list of available titles (and asking your library to order them in) may help give them some incentive.

Reaping the rewards

The rewards found by actively improving learning habits will extend far beyond mere grades.

The rewards
<ul style="list-style-type: none">● making school enjoyable● making school easier● improving marks● making internship and first job easier● improving entire career● improving quality of life

Students have often never considered the idea that rewards in university (and in life) may sometimes be internal. They can be focused on external rewards. Thus, they hope that by doing as they should, someone will notice and reward them appropriately in the form of grades which will eventually lead to money. However, unassertive thought does not lead to any internal rewards. The advantage of developing active learning skills is that internal rewards, in terms of emotional health, are immediate. The external rewards from improved grades become a bonus.

Engineering and technocratic skills

Students often enter engineering school with very wrong expectations. They think they will be receiving some certain knowledge in a very specific engineering discipline that they will then apply as engineers in that discipline. Although this describes a technical school preparing someone for a trade, engineering schools produce people capable of doing things they have never done before.

Engineering school can only teach a tiny percentage of the total engineering knowledge in the world. Most engineers are expected to constantly learn new technical knowledge and apply it as a matter of course.

The skills acquired in university are much more valuable than knowledge

“An engineer is someone who knows where to look things up.” -Author Unknown

- an engineering degree has to be done in 5 years
- the half-life of an engineering degree is 2-8 years.
- the great skill of the engineer is design, something barely taught in school
- the majority of engineering graduates do not have an engineering career

The engineering degree must be done in a short time to demonstrate the students ability to learn new information quickly. This makes sense considering the short half-life of the knowledge obtained. But why take engineering at all if most graduates do not become practicing engineers? The fact is that there is a very high demand in our society for people who are technically literate (sometimes referred to disparagingly as *technocrats*) in a very wide range of jobs. It is engineering and science degrees that fill this need. The technocrat will be expected to handle technical information, to understand diagrams, be very computer literate, think logically, and be able to deal with numbers. Since technocrats tend to make more money than practicing engineers, so hopefully students will not be too disappointed to find this out. In any case, active learning skills developed in university will be invaluable in any kind of career. These skills may be obtained after graduation on the job, but this is much more difficult and slows down the career path.

Conclusions

Students entering university carry old habits from high school. Rather than trying to adjust and find new strategies for a new environment, the majority of students do as they should. This problem is especially pronounced in the engineering discipline where students have a large, difficult workload and are especially likely to go into a survival mode instead of thriving. This

seminar is intended to inspire students to abandon old habits and find out what really works. It encourages students to pursue the goal of learning and discover ways of accomplishing this goal rather than relying on codes of behavior. Some concrete learning strategies are outlined and the seminar concludes with the advantages that will be carried over into a technical career. By giving this seminar, a single professor can have a large impact in the success found by his or her students.

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