

Session 4B3

# **Excellence Through Internationalization: Turning "Losers" into "Winners"**

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## **INTRODUCTION**

Norway, as a small country belonging to the Western Civilization, is strongly dependent on open links to the outside world.

Since the Vikings raided Europe about 1000 years ago, Norwegians have had a tradition of sending adventurous young people overseas for refinement, learning, and opening Norwegian windows to the world.

The "Viking Raids" of today are mostly directed toward Western Europe and the United States. The purpose seems to be education, adventure, and obtaining international contacts.

These modern 24-25 years old "Vikings" are, for technical studies in particular, typically transfer students from some of Norway's 3-year technical colleges called "Ingeniorhogskole" to some ABET-accredited American university or

college.

If these "Vikings" as a group should be described in a very rough and oversimplified way, it could be stated, that when leaving Norway, they represent the academic mediocrity, eventual losers among the nation's young people; when returning home after graduation, they represent a winning team.

Clearly, this group of transfer students goes through a "quantum leap" as to academic maturity during their 2-3 years stay and academic work in the United States.

How can this happen? How can possible losers in the Norwegian system turn out to be winners after having been exposed to the different conditions at some foreign academy? Why are they winners?

In an attempt to answer these questions, some features of the Norwegian system for engineering education will first be briefly described.

A sample of 40-50 transfer students from Telemark College to South Dakota School of Mines and Technology will then be used to illustrate a group of academic "losers" transformed into "winners".

Thereafter, some major points will be pointed out and shortly discussed in order to sketch an explanation to the apparent transformation which takes place among these students.

Finally, there will be a short discussion of possible extra benefits emerging from today's "Viking Raids" to the United States.

## **ENGINEERING EDUCATION IN NORWAY**

Degrees and institutions

At present, there are 2 basic levels of engineering degrees:

1. "Ingeniør" - based on 3 years of theoretical work (including laboratory and project work).

"Ingeniør" is the common degree offered by former "Ingeniørhøgskole" - now regional colleges (like Telemark College).

2. "Sivilingeniør" - based on 4.5 years of scientifically oriented study (including laboratory and research work). "Sivilingeniør" is the common degree offered by "Teknisk Høgskole". It is claimed, that the "Sivilingeniør" degree roughly corresponds to the Anglo-American M.S. degree. In reality the "Sivilingeniør" degree is between the American BS and MS degree.

Normally, it is possible for an "Ingeniør" to transfer to a "Teknisk Høgskole" to work for the higher "Sivilingeniør", or even "Doctor" degree. In such a process the "Ingeniør" normally loses one year compared to those Senior High School classmates who went directly to the 4.5-years of scientifically based program.

At this point - after graduation with an "Ingeniør" degree, some "Ingeniørhøgskole" alumni normally would choose to attend a foreign scientifically oriented college rather than a Norwegian university for their Bachelor's, Master's or Doctor's degree. A significant number of these students are choosing an American university or college.

Who enters which Engineering Program?

In Norway it seems to be firmly believed that there is correspondance between the grades obtained at Senior High School and a person's future academic success. This belief tends to inflate the grading process in the K-12 system, and makes it appear "impossible" to get admitted to most universities and colleges without having truly exceptionally good grades - or a lot of extra credits from "odd" studies and/or documented experience from practical work.

Even if engineering education may not be the young people's first choice, the pressure for being admitted to "Teknisk Høgskole" is high. If the Senior High School grades are ranking from "6" (Excellent) to 0 (No benefit from teaching) with "2" as the lowest passing grade, a "5" or better is usually required for admittance to "Teknisk Høgskole".

Such requirements, of course, adds to the prestige of those universities and colleges with high admission standards.

No wonder then that "Teknisk Høgskole" in general and "Norges Tekniske Høgskole" (The Norwegian Institute of Technology) in particular is the first choice of the entering technically interested Senior High School students with the

best grades. Or, it may be stated with some lack of accuracy, that the best students enter the scientifically oriented engineering program at some "Teknisk Høgskole" to become "Sivilingeniør".

After this process of selection, one may ask: Who are the remaining students, those who fill up the engineering classes at the regional colleges?

1. There are those who don't know what to do after Senior High School.
2. There are those who have flunked some courses at more prestigious institutions.
3. There are those who did not meet the admission requirements set by their "first choice" colleges and universities.
4. There are those who are seeking further theoretical technical education after having some years of vocational experience.

In short:

The path towards an "Ingeniør"-degree tends to be chosen by people at a lower starting academic standard than those seeking the "Sivilingeniør"-degree.

## **SOME CHARACTERISTICS OF THE YOUNG "LOSERS"**

### **Letters of recommendation**

From letters of recommendation written for roughly 50 students the last 5 years, at least some information may be extracted.

These letters contain information about grades, approximate rank in class, and the students' interests and extracurricular activities. Although the single individual will be well hidden in the material which is to be presented, it should be possible to say a little about the group. Let us first define

### **The Losers**

First of all, the denomination "loser" should be examined the way it often is done in Norway: By looking at the grades.

Norwegian universities and colleges use the grading scale 1.0 to 6.0, where the first represent true excellence and the latter virtually nothing of value. The lowest passing grade is 4.0.

Norwegian schools do not apply "average grade", "grade point ratio" or other systems for finding ONE SPECIFIC number representing the students' achievement.

Nevertheless, if the unweighted grades of each transfer student in the group are summed up and divided by the number of grades, we find an average. If these averages are added and divided by the number of students, we may find a number, maybe representing the average academic level of the group.

This "average" grade is 2.97.

As it is believed that the normal, hard-working student should earn the grades 2.5 to 2.0, it appears that there is reason to claim that this group is truly representing mediocrity.

As 2.97 also is too poor to ensure enrollment to further studies, the group may justly be called losers from an academic point of view.

### **Rank in class**

A system of ranking students against another is not practiced in Norway. However, from the letters of recommendation it can be read that

- 27 students (54 %) may be ranked as above average of their class
- 15 students (30 %) seem to be average
- 8 students (16 %) have been labeled "somewhat below" average

Instead of yielding to the temptation of making a conclusion or two on the basis of these figures, it should rather be noted that this way of looking at the group tends to improve its academic reputation slightly.

### **Extracurricular interests and activities**

Based on information given by the group, it appears that fairly low academic achievement does not necessarily mean lack of vitality and responsibility:

- 31 % are active in more than one discipline of sports
- 24 % are playing more than one music instrument
- 33 % are having real-life working experience; 4 % of the gross total are running their own firms
- 6 % are active in politics
- 70 % are reporting active interests in multiple disciplines and activities
- 76 % are having some commitments within organizations; 56 % of these in 2 or more different types of organizations

## Losers?

It can hardly be surprising to find that many young people performing poorly at school, are pursuing a rich and committed life, often serving organizations and institutions with devotion.

In contradiction: It should rather be expected that young and growing people find themselves in opposition to the established educational system while they are expressing their feelings and dreams by doing favors for others.

## Their potentials

How can their potentials as future "winners" best be described and predicted?

One way of doing this is to consider the shape of a rectangle as shown in Figure 1. Let the base represent the number of these students' activities, and the height represent the level. The product should then represent effort and commitment, call it "work".

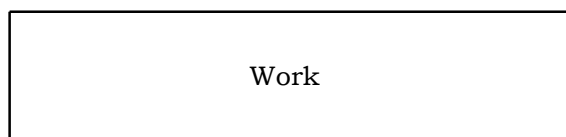


Figure 1: Many activities (horizontal) times moderate level of effort (vertical) produce work

If, by some way, this imaginary rectangle could be twisted 90 degrees as in Figure 2, then the area of work should remain unchanged but the level should increase at the expense of the number of activities.

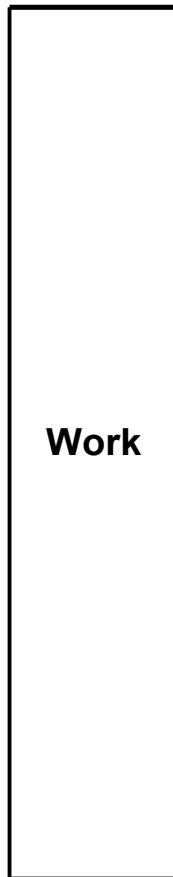


Figure 2: Activity concentration (horizontal) times a high level of effort (vertical) produce (at least) the same amount of work

What happens, then, when a group of people at a mediocre academic level are - eventually - concentrating their energy about reaching one specific goal instead of spreading out their good will at any interesting activity?

## **THE WINNERS**

### **Academic performance**

Without having done an extensive research into this field, it is hard to say anything very precisely about the group's performance in the United States at large.

However, from the South Dakota School of Mines and Technology it has been reported that the Norwegians as a group are performing well.

This good performance has been the rule through more than 30 years of experience. A significant (and typical) indication of this may be the fact that last

fall 23 of 28 entering Norwegian EE students had an average above B.

For a Senior class in ME a couple of years ago, the grade point ratio of the Norwegian members of the class was reported to be an impressive 3.67. But at this stage of the academic process the students were "broken in".

What can the reasons be for this not only "significant" but rather dramatic change of a group's academic performance?

### **Turning the rectangle 90°**

Several reasons for the amazing transformation may be listed. A majority of these have been mentioned by the students themselves, when some of them visit at the Telemark College campus to inform students here about the opportunities at South Dakota Tech.

1. Bravery. The transfer students are taking chances by leaving the safe conditions at home to explore the unknown.

These unknowns may be:

- o Learning to know oneself. They know they have to work hard for success, and the words "work hard" have positive attributes when they talk to perspective new students about the conditions they will meet in America. The questions they ask themselves are: Will I be able to put the necessary amount of work into my studies? Do I have the strength to examine the frontiers of my capabilities - even in an unknown environment some thousand miles away from home?
- o What about the economy? Most Norwegian transfer students are supported by loans and scholarships from a state foundation. They some times leave without even knowing for sure if the State Loan Foundation will secure them economically.
- o What will other people say? These students know that everyone in their family and community (often small) know they are studying in the United States. Thus, everybody will know about their success or failure.



- o What about the future? Most of them are not even guaranteed a job when they finally return to Norway with their Bachelor's or Master's degrees in their bags. "How well do I compete with the Norwegian Sivilingenior"? "Will industry and public utility companies accept me"? Such questions are known by most homecoming graduates.
2. Change of system. All students mention the importance of being involved in an academic tradition different from the one they know from Norway.

The Norwegian system "assumes" that the students are taking the full responsibility for their academic progress. They are enjoying (too?) much freedom, and the student-teacher communication may suffer from this.

At South Dakota Tech they meet quite another world. At first they are skeptical to what they call a "grade school system" where their progress is constantly being monitored throughout the semester. (In Norway grades are determined solely from a single exam given at the conclusion of the course.) After a while, however, this system is appreciated and even strongly defended.

All students are mentioning the value of having readily available, dedicated teachers open to 2-way communications.

3. A strong social solidarity. Over the years, Norwegian students have built a strong network in order to support each other professionally and socially. Senior students assist the newcomers with transportation, finding housing, buying cars, etc. The Norwegian students arrange open parties, celebrate important events, take common actions toward the college, and so on.

## **SUMMARY**

It has been stated that the process of practical internationalization described in this paper indeed turns "losers into winners" on the personal level. But there is another winner, too.

Norway, this small country so dependent on open links to the outside world, gets at least some important returns on invested money (scholarships).

Norway gets

- engineers with an international education, supplementing the domestic engineering colleges
- engineers mastering today's language of the world: English
- engineers with an eye for opportunities caused by different cultures and traditions
- engineers having already made some valuable international contacts

This list may be prolonged "beyond limits".

Such results would probably be obtainable for most disciplines, most schools, and work bilaterally. All we need to do is making personal contacts, talk together, plan together, and act together..

The challenge and task are ours: Let's do it!

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Trond Clausen received his BS degree from South Dakota School of Mines and Technology and Sivilingenior degree from the Norwegian Institute of Technology. He has worked 11 years as Rektor of Telemark School of Engineering Technology, and is presently associate professor at Telemark College, working with applied power electronics. Besides this, he has worked with legislative, structural and educational problems at the local, national and the Scandinavian level.

Larry Simonson

Larry Simonson received his undergraduate and graduate degrees from South Dakota School of Mines and Technology. After working in industry for Texas Instruments for three years, he returned to his alma mater in 1976 and has been there ever since. During the past 18 years he has taken two sabbatical leaves. The first was an industrial experience with Honeywell in Minneapolis, Minn., where he worked with thin film processing for the Solid State Electronics Division. His second sabbatical leave was spent in 1991-92 at Gjøvik ingeniørhøgskole in Norway where he taught an introductory course in electrical engineering and statistics.