



Faculty of Engineering  
Cairo University



# Mechanical Design Engineering Cairo University

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TUNING AFRICA CONTRIBUTION

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## Abstract

It's necessary to be aware with educational situation happening in surrounding environment. Thus, Tuning Africa students' call seek a higher education harmonization discussion between participated Universities, to ensure the transformation and enhancement of learning for the mission of the institution within which student learn.

It is expected from Tuning Africa second general meeting, that students will gain an advantageous experience which will be very useful for the process of having a future qualified job.

In this call Tuning Africa is focused on validation of **one generic competence**: *the ability to translate knowledge into practice*.

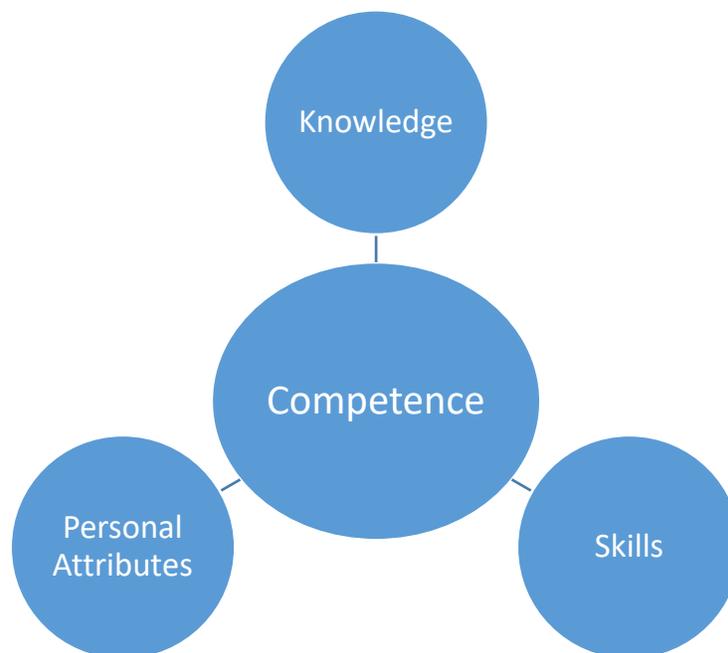
Through this report I will try to clarify all the required questions, as well as the additional questions in the field of **Mechanical Design Engineering** in **Cairo University**.

## Introduction

Participants from different universities all over Africa are gathered to work on Tuning Africa project “**one generic competence**”, which to explore methods of developing outcome-study programs to produce professional graduates that can compete in the world market.

This report highlights **Cairo University** Particularly Faculty of Engineering, **Mechanical Design Engineering** program.

Competence is defined as the capacity to learn and stay up-to-date with learning. Determination and perseverance in the tasks given and responsibilities taken. Moreover, the ability to search for, process and analyze information from a variety of sources. Gaining the skills of applying knowledge in practical situation.



In this report, first, questions related to competence are discussed which are marked as obligatory in the contribution requirements. Then, additional questions are discussed which are a type of interviewing other colleagues. Finally, a summery about any differences or new ideas that I have concluded from my own reflections and my interviews.

## 1. The Most effective course helping me to develop this competence:

This discussion is mostly from my point of view which I think it ensures the voices of some of my colleagues, and later I will discuss 2 different views from 2 of my classmates.

In my point of view, the most effective course was Group Design Project MDPN313

Through this course, it was required to design a **scissors lifting mechanism** for lifting trucks for maintenance and such a work. This project was held during the whole semester in a group work. This was great in applying knowledge, understanding of the subject area and grasping of the profession

This gave me the chance to comprehend the real life to compare between materials, to select the appropriate material needed, also, to check the market for prices and availability of these materials.

It gathered between many different courses:

- **Fluid Power System**; to select the required hydraulic circuit for the mechanism
- **Automatic Control**; to be able to control the movement of the mechanism
- **Machine design**; to design the mechanism parts using modelling software's and finite element analysis

With no doubt, this course got me the skills of information and communications technologies. In addition, it had a great impact for me to make reasoned decisions

## 2. Course-related activities which have helped me to develop this competence

For sure being a member of a 3-memebrs team encouraged me to advance my ability to work in group. Getting through the market to compare materials, prices and checking spare parts.

I got through some Self-learning processes to substitute what more details I haven't been told during classes

### The most effective activity

Getting through the market checking for the availability of parts and materials, although to satisfy the reliable prices. This activity had a great outcome on how to adapt and act in new situations.

### 3. [Aspects of the competence that I have developed through being a member of a club](#)

I have been participating as an organizer in ISCL “**International Student Leadership Conference**” for 3 years. It is a student activity takes place in AUC “**American University in Cairo**”. I have participated as a Decorations & Supplies organizer for 2 years, and a Fundraising organizer for 1 year.

During this period, I have totally developed too much skills. I have developed by communication skills, when you join a group work you may not be a leader, but definitely your contributions will be valued. I have become an active member in a group specially when working towards a common goal.

When I participate in an activity, I am no longer following the lead of professor, I am learning to become a player on a team of students. There may be leaders who will guide our group’s objectives, but every member is supposed to pull their weight and help the group achieve its goals.

This opportunity gave me the chance to know more about myself. To learn from how other students handle certain situations and test my current knowledge.

### 4. [In the course guide there was some reference to this competence](#)

For sure every professor aims to deliver the most effective outcome from his course. During this course, our professor encouraged us to go through market, internet searching and self-learning to gain what have other theoretical courses failed to deliver. Exploring real life market illustrates how to communicate with non-experts of our field.

#### [Competence Assessment](#)

This competence was assessed as a form of experiments, lab measurements and such a practical work on faculty campus. In addition, some projects were required which has developed the experience of on-site estimation.

#### [Evidence of achievement](#)

To illustrate this assessment for employers, I will certainly show them my achieved work through years of education. My completed projects which I have accomplished as an assessment of this competence.

## 5. Aspects of competence developed outside the university

In mechanical engineering field, I have participated in different training opportunities. I have been involved student training in ENPPI "Engineering for the Petroleum and Process Industries"

Also, I was lucky to have another training opportunity in NANSC "National Air Navigation Services Company"

Alongside my field, I had the opportunity to participate in different fields which helped me in developing more skills, thus, being able to apply it in education and real life.

During summer vacation, I had the opportunity to work as an ushering and sales member for the electronics and appliances company *Samsung*. Holding down a job while in college puts a lot on your plate. Surviving in a workplace certainly developed my skills of scheduling and time management. I have to prioritize, organize and take care of my time.

It's better to make these adjustments while in college, rather than struggling with life's realities after graduating.

Moreover, I have done some acting scenes, and participated in 2 TV commercials. Standing in front of camera, people watching and a director, has surely develop me in presenting and being self-confident.

Hopefully that these skills beside my knowledge help me to fulfil my needs in finding better field job opportunities.

## 6. How contexts have contributed to my development of the competence and their relative strengths

Obviously, sacrificing my time throughout different activities is worth the benefits I receive. Joining clubs and participating in decision making makes me feel like I belong to environment, which definitely makes me explore how real life goes on. Education only will not help me reach every destination targeted as a graduated engineering. These activities I got involved through, was to complement the university academic curriculum and to augment my educational experience. It had a great impact improving my leadership and interpersonal skills, as well as increasing my self-confidence. Participation in extracurricular activities and leadership roles in these activities are positively linked to attainment of my first job.

While working for diverse activities, we always looking for improvement of these activities but on campus scale. On wider scale, this will make me desire a better environment as near as my previous involved activity.

Exploring market searching for our projects needs, has developed my skills specific to my career path and essential for future job success.

## 7. Do I think that I have fully developed this competence?

Of course I haven't fully developed this competence, as I believe that there is always a room for improvement. The best way to succeed is to always discover and look for more. Whatever the maximum I will reach through life, there will always be more of it. For this reason, I see that there is a lot to do to improve my level of competence while I am student, as well as when I graduate.

### What I plan to improve my level of competence while I am a student

Actually, I am looking forward to engaging myself in more activities. I don't refuse any job opportunities during vacation or even when the semester is running. I am trying to apply my knowledge while working on my graduation project. In addition, I am trying to explore what on-site jobs need, to develop it throughout external courses and self-learning. I am also willing to have more internships through my field. Participating in **Tuning Africa** is also a good way of competence; as it will give me the chance to meet more student from all over Africa, listen to different voices and having a good discussion internationally

### How I think I will go on developing this competence when I am working?

I will try to meet market needs, will always look to improve my skills and level competence as I will see in real life. It is never late for gaining more experience from different internships. It is better to always look for adjustments rather than struggling.

## Additional Questions:

These questions were answered after interviewing 2 of my classmates and discovering their way of thinking about the importance of generic competence

### 1) Which course was the most effective in helping you to develop this competence

First opinion: For sure, **Group Design Project** and **Graduation Project** gave me the ability to connect theoretical knowledge with professional industries. It also forced me to use advanced computer aided engineering software's to solve complex structure problems (finite element software's). Then, we had to present this work in front of a jury to rate it, which increased presentation skills.

Second opinion: I would have to go with the course "**Group Design Project**". This course without a doubt combined all the other courses together and made me use all that knowledge I acquired, while introducing me to some other great tools I could use to put my engineering knowledge into practice.

### 2) Course-related activities which have helped you to develop this competence

First opinion: The sense of market and materials availability in the country. Some courses projects required us to buy some mechanical elements from suppliers and assemble them. This connected me more to industry and design for manufacturing.

Second opinion: The activities that were indeed useful to me outside the class room were taking measurements, conducting scientific experiments and of course computer modeling. As an engineer it is crucial to have hands-on experience and being able to put that knowledge into practice so it is safe to say that I now have the ability to measure almost any quantity and can give a close estimate to how structures or machines can behave while being put under certain loads; due to my work with experiments and computer modeling of real life structures and machines.

### 3) Which aspects of the competence have you developed through being a member of a club?

First opinion: Ability to communicate and share knowledge as well as receive knowledge from club members.

Second opinion: Have not participated in a club or student activity before.

### 4) In the course guide there was some reference to this competence

First opinion: Yes, I think most of professors tries to guide us through the agenda of the course. This help us in expecting what is going to be learnt. Some instructors surely motivate us to improve our level of competence, as they already have an experience in profession

Second opinion: The instructors of the courses we take always point out the things we should acquire throughout the course so that we get a clear idea of how this knowledge could be applied to our daily life. Assessment of our knowledge or competence would sometimes take place in the form of lab exams, projects, on site work, and things of that sort. I feel if I were to show my employer my knowledge and competence I would most likely be able to show him my achievements.

#### Evidence of achievement

First opinion: Definitely, I will them my already done projects, my progress in graduation project. Also, I Would show them my grades throughout completed projects.

Second opinion: I feel if I were to show my employer my knowledge and competence I would most likely be able to show him my achievements.

## 5) Which aspects of the competence have you developed outside the university?

First opinion: Outside university, there are sports that strengthen the competence behavior and activate mind and body. In addition, there is charity work that I did in a summer vacation. It was about educating young students who don't have enough money for proper education. Charity work always increase your self-esteem and make you feel that you give something that is useful to humanity.

Second opinion: My competence through computer simulation and modeling have developed outside university due to my continuous practice and the modeling courses I took in my summer holidays, I have been able to simulate machines and mechanisms and do a full analysis on them to check if they could be put to good use or not. I believe that my summer internships in factories and engineering companies have helped me greatly to develop my competence and made me aware of how my acquired knowledge could be put in to action.

## 6) Do you think that you have fully developed this competence, If not, what are you willing to do to improve it?

First opinion: Of course there are a lot to learn and gain in life. As a student, I should work more to earn more about professional market skills and knowledge. In addition, presentation skills are a very important skill to master as it is the way to express your work as a professional engineer. As a working engineer, I have to follow up with the latest updates in my career, as not to get away from the engineering knowledge and sciences.

Second opinion: I cannot say that I have fully developed my skills, all I can say is that I have learned a great deal and I know how to put my knowledge in to applications and make them work, I am still a student and I still have much to learn but I intend on developing my skills and will work hard to reach my full potential, through more practice, further study, and more advanced courses.

In my point of view, I see that my classmates have confirmed the answers I did. Competence is undoubtedly something has its impact and benefits on all students. Most of us, students, tends to improve as much as we can from skills.

## Conclusion:

To sum it up, competency will help us to define and communicate career opportunities. It is underlining the characteristics of a person which will enable him to deliver his maximum performance through a given task. Competence is a set of success factors; it includes the key behavior required for excellent performance in a particular role

*“knowing is not enough, we must apply.*

*Willing is not enough we must do”*

- Goethe