

# Coach ING: From model to tool

Viviana Callea, Lia Matrisciano, Roberta Tempone, Antonio D'Andrea,

Mihai Ursache, Giulia D'Angelo and Germana Remigi

Civil and Industrial Engineering Sapienza University of Roma –

Fly Fish srl and Consultant

Rome, Italy

Corresponding e-mail: [viviana.callea@flyfish.it](mailto:viviana.callea@flyfish.it) (viviana.callea@uniroma1.it)

## *Abstract*

Coach ING, a skills model aimed at the field of training and professional development, integrates the strategic approach of coaching and the systemic and programmatic method of engineering, stimulates awareness of one's personal tools and strategies and leads people to achieve personal and professional growth.

The integrated, adaptable and transversal skills model, through personal skills and technical skills gives life to a personalized and original resolution system. It is the result of an experiment started in 2014, based on a concrete userbase of "technicians", members of the Council of Engineers of Rome and Province, which led to the selection of the 16 skill sets, borrowed from skills typical of engineering and those from the strategic and relational ones of coaching.

The selection of skills and their evaluation on the available samples were made possible thanks to the use of Data Sheets and Collection Models specifically built and submitted to the samples during the Group session in the classroom or in the laboratory as one. The observation of the samples, the self-assessments, the mutual evaluations in the group work and during the effective experiments have defined not only a scale of reference levels thanks to the comparison with groups **not part** of the development path but also the collection and gathering of stimulus questions and answers typically related to and associated with the skills of the Coach ING model.. After years of experimentation with Senior technicians, a further fundamental contribution in experimenting with the method and in the process of consolidating skills took place in 2017, thanks to ~~these~~ users who would have acquired the skills to make them mature over time: the students. In this regard, in 2017 the Coach ING skills model was proposed at a first sector conference (World Engineering Forum 2017) based on the possible comparison between the data collected over the years with Senior engineers and professionals in the sector and the first data collected by students of a first university laboratory (pilot project in which this new training approach was used), in which to transmit

tools, scenarios and strategies useful to young future engineers close to "Entry into the workforce" (title of the related university course).

A few years later, today in the fourth edition of the laboratory "Entering the workforce through the Coach NG system", the same model tested in recent years has also been introduced in a further new project called DIRECT-ING, a format created as part of the Orientation and Tutoring Project of the Faculty of Civil and Industrial Engineering at the University of Rome Sapienza. The intent is to make it a tool for assessing managerial potential, useful and available to a new generation in world of engineering and future technology. Thanks to online meetings organized as a Focus Groups, the direct comparison between the groups of newly enrolled or attending students, method experts and teachers, made it possible to verify and validate the "stimulus questions" associated with Coach ING model skills, collected and **put together** over years of application. In this way, the questionnaire is now a useful tool to bring out the potential, the attitudes and the predisposition of the students in relation to the managerial skills referred to in the model. Students are thus directed towards the training and work opportunities most suited to their characteristics because they understand better what to do and how to choose and select the best job applications. The method can also be made available to companies which have the opportunity to select motivated people by investing their time and resources in the best possible way.

**The entire process is therefore effective from the perspective of both the student and company looking to hire.**

**Keywords:** *Engineering, Coaching, Skills.*

## *Premise*

The rapid changes in the economic-social context have an inevitable impact on the training models tested so far and on the working methods. Today's managers must be able to

operate with greater reactivity and flexibility, dealing with an increasingly **fast** changing, demanding and unpredictable market.

Therefore, it becomes necessary to update skills in a flexible way that is compatible in changing work environments.

New themes and training methods are emerging, often based on innovative technologies and new opportunities and professional sectors.

The Coach ING model and its relative declination as the DIRECT-ING training tool are proposed to respond to the new training needs of the leading classes of tomorrow in a dynamic and innovative way, suggesting new transversal paths and easy access to students prior to becoming professionals.

### ***An engineered coaching***

With Coach ING we call not only the skills model but also the training strategy that integrates the strategic approach of the coach and the solution method of the engineer, which stimulates awareness of personal tools and strategies, leading people to achieve personal growth and professionalism.

The value of integration between what is present and known on a personal level and the proposed problem-solving method allows the user to establish visible, measurable and scalable results over time while maintaining high motivation and propensity towards the developmental goal of referenced skills, new creative and innovative skills, essential for entering into professional context today.

The differential factor of the model is that of being subjected to the same starting level as the participants, without any difference in approach, neither according to origin, sex, age, nor previous professional skills or experience.

### ***The methodology***

The Coach ING model supports in a very creative and powerful way the acquisition of a new set of skills through the discovery of the best resources, potential and personal characteristics.

It is precisely from the synergistic combination of the two disciplines underlying the model, coaching and engineering, that the methodology is founded, which is only possible through the analysis and application of skills from totally different but strategically complementary areas.

The definition of this model, which uses a selection of 16 skills, is the result of years of research and experimentation that began in 2014 in front of a user of "technicians" members of the Order of Engineers of Rome and the Province.

The success of the method on this first audience made the activities highly replicable and transversal.

The research data was collected with constant activity in the following years through 11 seminars, 14 work groups, 20 laboratories, 12 classrooms, with a total of 620 participants and 830 participations. Among the participants there is 35% female participation.

With regard to origins, the participants are distributed as follows: 45% from companies, 35% from free professions, 5% from universities and 15% from the PA (public administration).

These were concrete opportunities for experimentation that allowed the Coach ING model to reach its most complete and purified form in 2017.

The selected and defined competences not only represent the sum of the engineering competences and those of relational and behavioral skills of coaching but also represent a system of new and fundamental competences to draw from in order to manage and solve ones professional and personal life; it is not enough to recognize and acquire skills but must be constantly consolidated and increased.

### ***The skills of the model***

Qualitative skills analysis identified 9 core skills as engineering skills, summarized in the following Table [1].

SKILL	BEHAVIOR
INITIATIVE AND ENERGY	BE PROACTIVE AND EFFECTIVE
WORK ORGANIZATION, TIME AND RESOURCES	PLANNING IN THE PERSPECTIVE OF OPTIMIZATION
ORIENTATION TO RESULT AND TASK	DEFINE QUALITATIVE AND QUANTITATIVE PERFORMANCES
SELF - INVESTMENT	CONTINUOUS LEARNING
DECISION MAKING	BE AWARE OF OWN CHOICES AND RELATED RISKS
PROSPECTIVE THINKING	HAVE AN EXPANDED TEMPORARILIZED HORIZON
PROPOSALS AND PROJECTS	SOLVING COMBINING VARIABLES
ANALYSIS AND SYNTHESIS	DEEP CONTEXT READING AND PRIORITIZING
SYSTEM VISION	PRESIDATE ALL VARIABLES IN THE GAME

Table [1] Engineering skills.

At the same time, 7 competences were defined by the coaching methodology listed in the following Table [2].

SKILL	BEHAVIOR
ADAPTABILITY	REACT EFFECTIVELY
COMMUNICATE	BE CLEAR AND EFFECTIVE
BUILD RELATIONS	BE OPEN IN THE REFERENCE CONTEXT
SOCIAL INTELLIGENCE	RULE RELATIONAL STRATEGIES
INTERCULTURAL SENSITIVITY	UNDERSTAND NEW WORKING APPROACHES
CREATIVITY AND INNOVATION	CHANGE BEHAVIOURAL PATTERNS AND SOLVE THROUGH NEW IDEAS
ASSERTIVENESS AND INFLUENCE	OPEN AND COGENT COMPARISONS

Table [2] Coaching skills

These skills were transferred to users during the meetings by facilitators in the classroom through the use of individual and collective learning tools.

Evaluation tools - Data Sheets - submitted during the working groups such as role-playing, seminars, workshops and courses, together with tutorials, questionnaires and interviews, brought out the first results in terms of competence, correspondence between answers to the questionnaires and skills emerged, both in terms of motivation and potential encountered and recognized.

Observation and tests carried out by a group of engineers who tested the social platform Flyfish Zone, which consolidated the reference model, such as conscious use in the relationship in the online community gave further

concreteness to the research of interpersonal, communication and social intelligence skills.

These research activities also drew on data collected in assessments at sector companies (specified below) in order to collect information on the use of those skills of the Coach ING model that represented further reference values useful for the comparison between different seniorities. In this sense, levels have been defined within which samples such as Junior Engineers, Untrained Senior Engineers, Trained Senior Engineers can be included, where by trained we mean professionals who have followed training sessions with the proposed integrated system.

In this way, successive levels have been identified that indicate the degree of confidence and conviction with which the skills of the model are governed and used.

### ***Qualitative observations***

The investigation continued in a leading Hi-Tech company, therefore with a workforce of 80% engineers and technical staff.

The qualitative surveys referred to groupings of skills, constituting the composite skills referred to 4 reference macro-areas: Realization, Motivation, Relational, Cognitive. In this way, the 16 competences of the model were brought together so that they were comparable in these macro areas with the related data available.

All in compliance with the concept of competence defined as a set of "intrinsic characteristics of an individual, which are linked to performance, of which a criterion, effective or superior in terms of work done" [8].

The qualitative research observations available referring to the 4 macro-areas of:

achievement-Focus on tasks and results;

relational - includes skills that facilitate relationships and mutual understanding;

motivation and project area - includes the ability to integrate between different perceptual regimes;

cognitive-privileges all competences related to rationalization.

The experimentation allowed to select what became the 8 capabilities of the Coach ING model: flexibility, resilience, agile & high achievement Speedy-Thinking, confidence, courage, optimism and inspiration as macrocapacities containing a set of model competences.

### ***The determining role of students***

The exploratory research with the children has allowed us to submit and redefine those "stimulus questions", used and selected over the years, capable of facilitating the investigation and guiding the comparison, highlighting potential and talents, and bringing out surprisingly useful data.

In 2018, the work conducted in the second laboratory was presented at EFEA 2018 and started in the first in which we verified and validated the behavior of students in the use of

the elements of the competences. It was found that the most relevant shortcomings were found in the face of communication and the ability to analyze and synthesize.

During the first pilot laboratory, very interesting results were highlighted on extremely low levels of these skills in engineering students.

For this reason, we continued the research, with the students themselves and with the help of a series of coaches from an important reference school, using focus groups in which the communication and relationship elements to be validated and verified were defined. students.

The results presented and highlighted at EFEA 2018 today represent the starting point of this new work proposed on the basis of the DIRECT ING project.

The project is part of both the high school and the engineering faculty.

The subject of the survey is the skills, characteristics and skills needed by young people as citizens of the future and which today support the motivation to study a specific technical-scientific subject and to develop in the professional field of "engineering".

The multiple technical skills provided during the training courses constitute only a basis for the students' future working, and must also be able to constitute skills that can be used in the organization and management of their daily life. We talk about the need for transversal skills, able to provide to support and emphasize as well as multiply / amplify programmatic, systemic, organizational and methodological technical skills, able to transmit tenacity and continuity to face the studies in progress and arrive motivated for their professional future.

These specific technical skills of the engineer of tomorrow, supported and integrated with their personal characteristics and resources, abilities and predispositions, can constitute a set of transversal skills that can be spent in their professional future in important jobs, including managerial ones.

### ***The DIRECT-ING***

The analysis and experimentation of the project, as in a first phase it was addressed to the technicians, this time has as object of investigation the behavior of the children, with the aim of highlighting their reactions and their behavior in front of some of the skills detected by the model.

The experimentation project was put into practice as part of the Orientation and Tutoring Project (POT) of the Faculty of Civil and Industrial Engineering at the University of Rome La Sapienza.

With the name DIRECT-ING we indicate the training tool that uses the Coach ING model as a methodological lever to bring out the potential, the attitudes and the predisposition of young people in relation to the managerial skills highlighted in the model.

Structured through a series of online meetings between students leaving high school and / or freshmen with the Faculty of Engineering for a direct comparison in which to ask (20 "Stimulus questions" were submitted and validated), listen and collect considerations and points of views and answers on the skills needed by the engineer of the future.

### ***A new methodological and training tool***

The subject of the survey was the skills, characteristics and competencies identified as necessary for young, future engineers, to support their motivation even more than to establish themselves professionally. The interest of this experiment is in fact also based on the interest in finding the right levers that limit and significantly reduce the dropout rate from the engineering faculty.

The tool used to bring out these skills and competences was the set of stimulus questions built, used and extensively tested during the previous years with over 2000 senior and junior engineers heard.

These questions were found to be particularly effective, engaging and functional in increasing attendance at the meetings, thanks to a double validation system that makes it possible to verify the correspondence of the answers with the relevant skills of the model.

The verification and measurement tool constituted by this new questionnaire - at this stage - thus aims to verify, stimulate and bring out managerial skills that can be used today in the world of work and at the same time stimulates the use of the same during the course of study by supporting young people in the continuity and commitment to achieving the much desired result: the engineering degree.

### ***Success factors***

The DIRECT-ING format created in response to a University Orientation and Tutoring Project (POT) aims to inaugurate and consolidate not only a new direct link between Engineering and school (increasing the number of students) but also to build an effective tool of orientation that can be used in the near future in the most diverse fields. The cycle of meetings was managed online and organized as a Focus Group, working groups aimed at collecting information and statistical data relating to a given phenomenon under investigation. In particular, in the experimentation with the students of the Faculty of Engineering, it emerged that the many technical skills provided by the engineering studies do not only constitute a basis for their professional future, but are also skills that can be spent in the organization and management of everyday life, providing technical skills programmatic, systemic, organizational and methodological to deal with ongoing studies with tenacity and continuity. Furthermore, it can be seen how these technical skills, supported and integrated with their own characteristics and personal resources, skills and predispositions, constitute a set of transversal skills that can be spent in a professional future in significant jobs, including managerial ones.

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