Will (Not) the Integration of ‘Life Skills’ Boost the quality of training Computer Science Engineers in Morocco?

Azize Kour

ENSIAS, Mohamed V University, Rabat

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Abstract

‘Life Skills’ can be defined as intra and interpersonal skills such as knowledge and self-awareness, emotional and social intelligence, psychological resilience etc. In response to the requirements of the new development model that Morocco intends to undertake, and being aware of the importance of transversal content, the Ministry of Higher Education is introducing Soft Skills in the new reform of the Bachelor 2019 system. The latter will replace the system of 3-year BA in favour of a 4-year Bachelor and plans to include 8 new Soft Skills modules, including two dedicated to Life Skills. According to ministerial sources, the entry into force of this reform is scheduled for the start of the 2021-22 academic year. This article addresses the doability of integrating ‘Life Skills’ in training Computer Science engineers in Morocco. It seeks to answer one major question: will (not) the incorporation of these skills in Moroccan higher institutions enhance students’ motivation, employability and well-being? It sketches out a tentative review of the literature on teaching/learning of ‘Life Skills’ around the world. A questionnaire was devised and administered to 50 students in ENSIAS Rabat to investigate the issue in an attempt to
unravel students’ affective and attitudinal perspectives in connection with the integration of these skills in the curricula and syllabi.

Keywords: life-skills, teaching/learning, engineering, attitudes, higher education

1. Contextualizing the Integration of ‘Life Skills’\(^1\) in Teaching and Learning

The issue of integrating soft skills, or not thereof, in the teaching curricula has received divergent academic interests. Indeed, the multiperspectival facets of this topic have made it difficult to assert one comprehensive definition. Robles (2012), for instance, provides the following definition: “Soft skills are character traits, attitudes and …determine one’s strengths as a leader, facilitator, mediator, and negotiator” (Robles, 2012, p.457). These personality features and their attitudinal dimension render these skills essentially individualized and customizable. There is a lot of variation on how soft skills are labelled namely « 21st-century skills, general competencies, key competences, transversal competencies, etc. » (Manuel. Caeiro-Rodríguez et al, 2021:29222).

Nieragden (2000), in this respect, distinguishes four main groups of soft skills: « Interaction: (such as attitude awareness, conflict handling, tolerance.) Self-Management: (such as decision making, willingness to learn, self-discipline and resistance to stress.) Communication: (such as listening skills, presentation skills) Organization: (problem solving) » (cited in Elena Spirovska Tevdovska, 2015, p. 98). These skills namely communication skills, analytical, critical and problem-solving skills, lifelong learning ability, entrepreneurship and management skills are the ones that employers and headhunters consider as desirable skills to possess in potential employees. (Hairuzila Idrus et al, 2009, p. 69)

Holmes (2014) identified Soft skills that could be embedded into the course content as « communication and interpersonal skills, team-working, critical thinking and problem-solving, and personal development skills. » (Keow Ngang TANG, 2019, p. 3) It has become

\(^1\)In spite of the differences between them, this study uses soft skills and life skills synonymously and interchangeably.

58
almost ‘commonsual’ that soft skills cannot be learned passively, as raw knowledge acquisition. Students instead need « to adopt an active role where they can experience their capabilities, strengths and weaknesses in relation to soft skills. » (M. Caeiro-Rodríguez et al, 2021, p. 29223) Active and cooperative learning modes are therefore most conducive for developing soft skills. (Hairuzila Idrus et al, 2009, p. 77)

Soft skills are importantly valued in and for engineers to put effectively their technical expertise at work. Engineers need communication and persuasion skills, « the ability to lead and work effectively as a team member, and an understanding of the non-technical forces that affect engineering decisions. » (Hairuzila Idrus et al., 2009, p. 71) Engineers equally need the ability « to work comfortably with people from other cultures, solve problems creatively, write and speak well, think in a multidisciplinary way and evaluate information critically » (Gewertz, 2007). They should become, so this argument goes, « proficient problem solvers, able to work in multidisciplinary teams, ready to adapt to new technologies, and able to acquire new knowledge and skills when needed. » (Manuel. Caeiro-Rodríguez et al., 2021, p. 29222). Indeed, Pradeep Kumar Nair & Mehrnaz Fahimirad (2019) substantially focalize the importance of the integration of life skills at the university level in order to help students fine-hone their social, personal and professional skills.

The literature on personal characteristics needed in engineers in general, computer science ones in particular, are gleaned from the review of existing frameworks especially 21st century skills, skills you need, p. 21 framework). 18 (out of 44 general characteristics) were considered fundamentally important: « Formal, basic knowledge in their field, ability to integrate knowledge from diverse thematic areas, collaboration, sometimes in multidisciplinary teams, open-mindedness, high-level thinking, critical, analytical and innovative thinking, independent and autonomous learning, problem-solving, ability to prioritize… ability to assess information, particularly when coming from diverse sources, ability to follow systemic design processes, implementation and validation of solutions from the perspective of end-users, ability to analyse the factors that contribute
to an undesired situation, design and evaluation of alternative interventions towards solving a problem, implementation and assessment of the effectiveness of a solution, integrating and transferring knowledge to the real world, working with limited resources, and presentation skills. (Caeiro-Rodríguez et al., 2021, p. 29223-4).

There are three major challenges encountered by the instructors in their attempt at integrating soft skills in their teaching of technical courses; « These were the students’ attitude in the classroom, limited time to cover the syllabus and large numbers of students in a classroom. » (Hairuzila Idrus et al., 2009, p.73). In fact, the proposed methodologies suitable for developing the skills needed in the job market were: « Problem/project-based learning that involves educational activities in which students are challenged to solve a problem or to develop a project; Thinking-based learning that aims to develop better thinkers. Its goal is to lead to better lives outside of school. Thinking-based learning focuses on critical and creative thinking. It involves making decisions, solving problems, making predictions, evaluating information, etc; Competency-based learning that focuses on knowledge development in a manner that allows learners to use it in real-world situations. It revolves around the development of educational activities that promote competences that can be measured against real-world standards; in this context, each competence is an individual learning outcome. Students work on a specific competency at a time. Competences are viewed as units that are part of broader learning objectives. Students must master each competence before focusing on the next (Caeiro-Rodríguez et al., 2021, p. 22226). Wurdinger & Qureshi (2015), by the same token, contend that Project-Based Learning (PBL) is very conducive to enhancing higher education students’ life skills.

Cooperative learning encourages students to work together toward achieving specific goals. In cooperative learning, the educator sets up educational activities in a manner that requires student interaction and collaboration to be achieved. Students work in small groups to maximize their benefits from the learning process as well as the benefits of others; blended learning that integrates diverse educational methods, including traditional instruction, digital experimentation, site
visits, and others that combined provide an active learning experience for students that more addresses learning goals effectively, (Caeiro-Rodríguez et al., 2021, p. 22226); Gamification, referring to the use of gaming elements in contexts other than entertainment, includes learning, training, crisis management, research, etc. Gamified elements may include rewards, recognition, a sense of mission, clear goals, a sense of affiliation, feedback, etc; flipped classroom that aims at the higher engagement of students through blended, active learning approaches. The teacher plays the role of a mentor. Flipped classroom allows for more effective use of classroom time and encourages students to take responsibility for their learning (Caeiro-Rodríguez et al., 2021, p. 22226).

Massive open online courses (MOOCs) are also used to support the development of soft skills. MOOCs are mainly based on the delivery of video content and on the performance of continuous assessment activities, but hands-on activities and learning by doing based on real-life cases can also be found. Collaborative assignments and peer evaluation are other typical activities in MOOCs (Caeiro-Rodríguez et al., 2021, p. 22233). The use of Virtual Reality (VR) and Augmented Reality (AR) technologies as training tools for the development of soft skills is still in its infancy. However, the possibilities of VR and AR to immerse students in realistic situations make them attractive to study new approaches (Caeiro-Rodríguez et al., 2021, p. 22233).

It is believed that the evaluation and scoring the absence or presence of soft skills represent the two main stumbling blocks for their integration in the curricula and syllabi. The Measuring and Assessing Soft Skills project, therefore, outlined the importance of using different approaches to evaluate different groups of individuals. «O’Connor et al. introduced the results of the Grading Soft Skills (GRASS) project focusing on representing learners’ soft skills in a quantitative, measurable way to enable skills’ formal validation and recognition. » (Caeiro-Rodríguez et al., 2021, p. 22233). The assessment of soft skills can equally be supported by ICT tools.
2. The A(im)pplication of Teaching Soft Skills in Engineering Schools in Morocco: ENSIAS as a Case Study

This study is a seminal attempt at investigating Moroccan student Engineers’ attitudes towards the incorporation of soft skills in Computer Science training in Morocco and the challenges they face. These attitudes and problems encountered in incorporating these skills remain, to the best of my knowledge, an under-researched area in the Moroccan academic realms. This study stipulates the fulfillment of the following objectives:

✓ To find out Whether/how students consider the importance of Soft Skills integration in the engineering training

✓ To investigate their perceptions, problems and attitudes with regard to presence/absence of these skills in the training they get

The study hypothesizes and attempts at answering three main questions: Do (n’t) computer engineering students need soft skills? Does (not) the integration of Soft skills in their training affect their motivation? How do these students perceive of the integration of these skills in their training? The study utilized a quantitative methodology. A questionnaire was designed and administered to 50 respondents in an engineering school (ENSIAS) in Rabat. The data were processed and transformed into pie charts.

Fig 1. The suggestion to teach ‘Soft Skills' to engineers is:
Almost half of the cohort taking part in the study asserted that teaching soft skills to engineers is an excellent idea that ascertains quality training to them balancing hard to soft skills when only two percent perceive it as a waste of time. Indeed, technical-based job market presupposes graduates’ mastery of the job’s know-how. Effective communication proves to be quintessential.

![Diagram showing distribution of course requirements]

Fig 2. This type of courses should be:

More than half of the participants believed that soft-skills courses should be optional and presumably only learners who think they mostly need them enrol in and join these classes. This finding rhymes with the difficulty of evaluating these skills regarding their individual(ized) nature. The sought-after skill is indeed different from a learner to another depending on their major, age, interest and professional goals. 8% of the students involved in the study, in this vein, argued for the exclusion of these skills from the curricula. This skills’ exclusion, according to this group, does imply that some of these skills are already present and teachable in the currently used curricula and syllabi.
Fig 3. The impact of these skills on the involvement of the students in their learning will:

The integration of these skills in the syllabus will impact diverse aspects of students’ personal and professional lives. Indeed, an overwhelming majority asserts that the involvement of the students in their learning will increase and will help boost their motivation to invest in their learning experiences maximizing their retention and use of the skills and competences acquired in the classroom setting. The skills introduced and practiced in class will be eventually useful and extrapolated to after-school life’s (personal and professional) experiences.

Fig 4. The impact of these skills on the employability of the students
It is oftentimes contested that school life and the job market are incompatible. Judicious introduction of soft skills in teaching and learning different subjects, according to 92% of the respondents, will entrench the reinforcement of employable skills in learners. A relatively important number of the participants, on the other hand, conceded that employability has no direct connection with the skills students acquire during scholastic life. 8%, so this argument goes, stated that there will be neither an increase nor a decrease in the rate of employability with regard to the presence, or absence thereof, of soft skills. School credentials used to be the sole criterion for eligibility. The job market nowadays entails a richer skillset that minimizes the intensity of the employee turnover.

Fig 5. The impact of these skills on the academic performance of the students will:

Increasing is equally the impact of the soft skills on the academic performance of the students. A big number of participants (84%) contended that students’ academic scores will improve. This finely-tunes with the above-stated finding that students who are exposed to soft skills training are likely to be involved in their learning and will be thus motivated to work harder and excel in their studies. It cannot, however, be disregarded that another equally interesting number of respondents (16%) assumed that introducing soft skills in teaching/learning will not either increase or decrease the academic performance of the learners involved. Learners’ awareness to the
qualities of a 21\textsuperscript{st} century skilled individual contributes to both academic and professional accomplishments.

![Pie chart showing the impact of skills on student relationships]

Fig 6. The impact of these skills on the students' relationships with others will:

Interpersonally, these skills are believed to sustain and enhance relationships among learners who benefit from the training on soft skills. Life skills not only increase employability. They additionally help forge compassionate and empathic human encounters. It is noteworthy that 12\% of the cohort participating in the study, similarly to the above-mentioned exception, assumed that these skills have no direct impact neither on the increase nor decrease of the student-student relationships.
The general well-being of the students is the sought outcome behind any attempt at integrating soft skills in the engineering training. 90% of the respondents affirmed that the general well-being of the students who are exposed to the acquisition of these skills will increase. The ultimate goal of education rests on balancing the student’s knowledge, know-how (skills) and importantly well-being.

The participants suggested a set of skills that they deem primordial to Moroccan computer science engineers namely: Leadership skills, social skills, problem solving, the art of negotiation, public speaking, self-awareness, stress management, decision making, communication skills, active listening, self-control, employability skills, adaptation, the mind-set of the rich, cultural awareness, emotional intelligence, critical thinking skills, personal development, and overcoming failure. This inexhaustive list corroborates that engineering students are relatively aware of the necessity of life skills in both personal and professional realms.

This study is not immune from a plethora of limitations that are meant to be addressed in the near future in-depth studies on the same research area. Indeed, a bigger number of respondents (engineering students from different cities/regions) might give a clearer picture about the incorporation of soft skills in training engineers. Other research tools such as in-depth interviews and focus group discussions might have equally deepened the research with regard to the issue.
under study. A mixed method design, in this respect, gives deeper insights into the elicitation and measurement of the students’ attitudinal standpoints regarding the topic under research. It is also important that attitudes and behaviours are oftentimes confused and not easily demarcated. This study would be deeper and more insightful if focus was only on some specific soft skills than on the whole skillset required for engineers. Teachers’ perceptions and problems, in their critical importance, were not addressed.

In the light of this study’s findings, it is highly recommendable that university professors ought to sensitize and support their students regarding the importance of soft skills for both their personal and professional lives. Professors equally need intensive and structured pre/in service training on the methodologies of integrating/embedding soft skills in their teaching material. It can also be contended that it was high time, as Assiter argues (1995/2016), for the syllabus to be updated and revisited.

References
Appendix 1: Respondents’ further comments or thoughts

« I think that life skills are very important for a good life since they will help increase many positive points like struggling against bad situations and being a part of change in the process of development and enhancing the quality of life. »

« A life skill module will definitely help students to socialize and be more confident in them. »

« That’s pretty much a very beautiful activity that would save some kind of people who struggle with their own hidden life, it is not necessary that someone would tell his/her problem but some advices are useful silently. »

« It’s pretty important to include life skills topics because even the future engineers have a high level (academically speaking) they still have many problems in terms of how to communicate with others and how to be honest with them first. »

« Learning life skills can never be a waste of time, the more skills we will learn, the more money we will earn. »

« One of the most important skills to learn when and how to say no and sadly it’s excluded. »

« I do think that this kind of skills is not to be learnt like the usual course since they require more practice than theory. »

« This is a step in the right direction, however, I wish that buzz topics and overused subjects be avoided; or at least painted in a new light. Media has overused most of ‘life skills’ subjects, that the reactions to something like this would be « oh it’s that motivation gibberish again. »

« Life skills, if they are taught in schools or universities should have defined goals from the start and clarity about what they are useful for. That way, each student can choose what life skills to work on according to their needs and goals. »

2Participants’ viewpoints have been kept unchanged (even if they contain numerous mistakes) for the sake of originality.