# Soft skills enhancement through MOOCs courses: a Scoping Review

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**Abstract**

This paper turns to investigate the promotion and development of soft skills through MOOCs courses. Specifically, the article in the first theoretical part defines the concept of competence and declines the concept of soft skills according to the latest reference theories. The exploratory investigation was conducted through a Scoping Review using the methodology of Arksey and O'Malley. The objective was to investigate the impact that MOOCs courses can have on the promotion of soft skills and was born out of the growing consideration of soft skills development in academia.

The findings by means of the Scoping Review shed light on the important role that academic learning science centers can play in training teachers and students to improve their soft skills. In addition, the results highlight the need to create personalized learning pathways for students to promote more effective learning and the development of soft skills needed for future labor market access.

**Keywords**

MOOC, soft skills, non-cognitive skills, education.



## 1. Introduction

Nowadays, due to continuous social, work and cultural changes, special attention has begun to be paid to the acquisition not only of so-called hard skills but also of soft skills. Soft skills turn out to be of paramount importance as they enable individuals to face new challenges, acquire flexible ways of working, promote cooperative learning, and operate in multiple contexts [1]. The World Health Organization defines soft skills-also called life skills-as "*abilities for adaptive and positive behavior, that enable individuals to deal effectively with the demands and challenges of everyday life*" [2].

The focus on soft skills is increasingly relevant today, especially in the Italian context where the Chamber of Deputies on January 12th, 2022 approved a bill named "*Provisions for the prevention of school dropout through the experimental introduction of noncognitive skills in the teaching method*" which promotes the inclusion of trainings aimed at fostering students' Non-Cognitive Skills in secondary schools within a 3-year period.

As Tino [1] states, it is necessary to become aware of the fact that "*today the competent subject is not the one who reproduces knowledge in a univocal and rigid way, but is the one who knows how to use the knowledge learned in a creative and flexible way, adapting to different situations and identifying*

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*creative solutions to new problems. Gaining awareness of this scenario is then also an educational responsibility, since the purpose of education is the integral formation of the person*".

Teaching soft skills is not simple. To date, there are several methods being experimented with, and one of them involves the use of so-called MOOCs - Massive Open Online Courses.

## 2. Theoretical Background

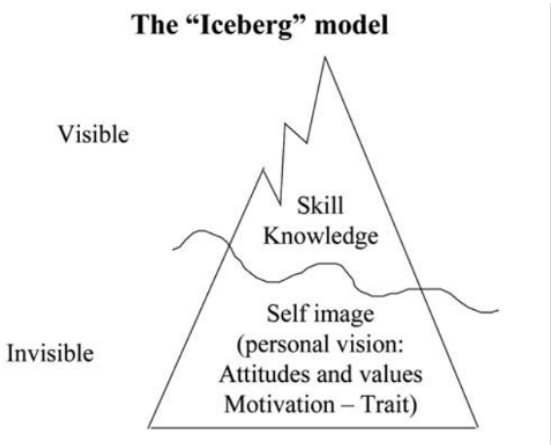
The concept of 'competence', over the years, has taken on different connotations. Even today it is still difficult to succeed in defining in an unambiguous way this concept.

In literature the first scholar to dwell and theorize on the topic of competencies was McClelland, in the field of organizational psychology. The scholar, in 1973, asserted that tests of study aptitude, school culture and academic qualifications are unable to predict an individual's professional success; therefore, according to the scholar, in the employment sphere for personnel selection it is ineffective to rely on intelligence tests, but it is necessary to assess the candidates' competencies [3]. A few years later, Spencer and Spencer, McClelland's students, theorized five dimensions of competencies [4] divided as follows:

1. Motivation, which is that structure that enables the individual to define his or her goals and achieve them;
2. Traits, or how an individual behaves or reacts to a given stimulus;
3. Self-concept, which refers to an individual's perception and evaluation of himself or herself;
4. Knowledge, understood as the body of knowledge an individual possesses about a specific domain;
5. Skills, which are the abilities an individual possesses in relation to a task.

Through these five dimensions, the two scholars theorize the so-called "Competency Model" using the metaphor of the iceberg (fig. 1). This metaphor is useful in understanding how the different components are going to be distributed, until they compact and then become components of success.

**Figure 1:** The "iceberg" model [4].




As can be seen in figure 1, at the tip of the iceberg it is possible to find "skills" and knowledge; they are found at the surface as they are observable and easily modified in relation to the situation in which an individual finds himself. At the non-visible part of the iceberg, on the other hand, it is possible to find motivations, self-image, and traits, which refer to an individual's personality structure and psychological traits, less affected by situations [4].

Le Boterf, in 1990, states that competence is "*a recognized and proven set, of the representations, knowledge, skills and behaviors mobilized and combined in a relevant way in a given context*" [5]; the theory of competence elaborated by Le Boterf is systemic, meaning that according to the author, an

individual's competence emerges only in relation to a given context and task. Continuing the historical excursus, Pellerey in 2004 states that competence is "*the ability to cope with a task or set of tasks by being able to set in motion and orchestrate one's internal, cognitive, affective and volitional resources and to use available external resources in a coherent and fruitful manner*" [6].

In the Italian scenario, ISOLF - Institute for the Development of Vocational Training for Workers - in 2004 launched an experiment, lasting about four years, entitled "Organization, Learning and Competencies" (OAC). The objective of this project was to study the relationship between "competencies," "learning," "training management," "organizational models," "performance," and "competitive environment." The context of reference is lifelong learning and it tries to close the difficult but necessary gap between employability-oriented solutions, solutions oriented toward modernization of the production apparatus, productivity recovery and competitiveness. In this context, the OAC project has been placed under the banner of a full recovery of the focus on work [7].

According to the most recent definitions, Tessaro [8] states that the connection between learning and work, between personal existence and professional life, is embodied in competence. Moreover, competencies do not coincide with skills and knowledge but represent the ways in which these skills and knowledge are activated in different contexts [9].

Conventionally, it is possible to differentiate between hard skills and soft skills. Hard skills are defined as the job skills, soft skills as the skills related to managing people. In recent decades, the view on soft skills has changed considerably. In the past, mastery of hard skills was valued first and seemed to be of paramount importance to the individual, while soft skills were considered "nice to have"; nowadays the perception has been reversed [10]. In fact, the term soft skills has been widely used to refer to all kinds of competencies related to interpersonal and intrapersonal skills. Pellerey [11] defines soft skills as nonspecific skills that relate to an individual's general ability to perform effectively in any workplace; they are generally described as perfectly transferable.

In general, it is possible to identify 22 soft skills divided into 5 groups: personal effectiveness skills (i.e., skills that reflect some aspect of an individual's maturity with respect to self, others, and his or her work. They are related to a person's ability to continue to be performant even under pressure or difficult environmental conditions), relational and service skills (i.e., skills that enable people to understand the needs of others and cooperate with them. Communication skills are related to all the other clusters but are included in this one because of the role they play in building relationships), impact and influence skills (skills in this cluster reflect an individual's ability to influence others), achievement-oriented skills (i.e., skills characterized by a propensity for action, a propensity directed more toward accomplishing activities than impacting other people) and finally cognitive skills (i.e., skills that reflect an individual's cognitive processes).

In addition, other terms have also been used in the literature to refer to soft skills such as "transferable skills," "soft skills," "emotional intelligence skills," and "employability skills". Moreover, according to the most recent studies, Non-Cognitive Skills are especially talked about as key skills to ensure success in terms of economic development [12]. Non-Cognitive Skills refer to all those human qualities not related to cognition. They refer to individual characteristics related to emotional, psychosocial and personality traits. Some examples may be motivation, resilience, empathy, proactivity and emotional stability. In fact, these skills, especially in Nordic countries, have positively affected employment rates, academics, health, life expectancy and income levels [13].

In Italy, a bill has been passed for the prevention of early school leaving through the experimental introduction of Non-Cognitive Skills into the didactic activities. The goal stated in the law is to increase, through teaching, Non-Cognitive Skills i.e., those skills that lead to positive and adaptive behaviors, which make the individual able to cope effectively with the demands and challenges of everyday life.

A primary role in the training and development of soft skills can be attributed to e-learning tools. Since soft skills themselves by definition are multidimensional skills, and since training itself is a process that can be based on the activation of multiple intelligences, digital and interactive learning tools can be ideal for training soft skills [14]. Among them, one way of learning soft skills could be through the use of MOOCs - Massive Open Online Courses.

MOOCs are courses that are usable at a distance through the web, massive and open, and free in their basic configuration. The term massive can have a double meaning; while for many it refers to the large number of participants, according to others the term refers to the amount of knowledge exchanged and a new participatory paradigm. The initiative has been inaugurated by well-known universities such

as Harvard and Stanford, channeling thousands of students to specific existing platforms such as EduOpen, edX, Coursera, and Udacity.

These courses are particularly valued by students for their inherent characteristics and purposes including [15]:

- Professional updating or deepening in disciplinary areas;
- Satisfaction of intellectual curiosity or need for cultural experience;
- Profit, in terms of spendable skills in the work environment;
- Acquisition of familiarity with digital tools;
- Opportunity for self-assessment and autonomy in learning, with positive effects on cognitive outcomes.

# 3. Methodology

The present study aims to investigate whether and how the use of MOOCs courses has an impact on the development of Soft Skills, in the academic context. A Scoping Review was conducted to investigate this aspect. This study is intended to be an initial exploratory investigation also aimed at understanding how to methodologically set up a future Systematic Review; in fact, in the future we will aim to quantify the impact and determine which criteria produce it.

In this first phase, the Scopus search engine was used. The keywords used were: learning; mooc (or moocs); soft skills (or soft-skills).

In the research and analysis phases, the methodology of Arksey and O'Malley [16] was used. This methodology is characterized by the following 5 steps:

- Identification of the research question;
- Identification of relevant studies;
- Selection of studies;
- Data tracking;
- Collection of results;

## 3.1 Identification of the research question

The research question stems from research interests related to the investigation of issues related to teacher education and soft skills development, in educational and training contexts, with a focus on new technologies. In particular, the interest about the impact that MOOCs courses can have on the promotion of soft skills stems from a historical period in which such courses have been used by a greater number of people [17] and in light of the increasing consideration that the development of soft skills has in the academic field [18, 19].

## 3.2 Identification of relevant studies

Having established the research question, the first phase of searching through the Scopus database was initiated using the following keywords: learning; mooc (or moocs); soft skills (or soft-skills). This first phase of search resulted in 14 articles.

## 3.3 Selection of studies

Next, the abstracts of all selected articles were read and analyzed according to the inclusion criteria of this scoping review: studies that implement or describe MOOCs that had an impact on the development of soft skills. Eight articles were selected at this stage according to the research questions and the inclusion criteria.

## 3.4 Data tracking

At this stage, the full 8 articles were read. All but 1 (a book chapter), were selected for the final review and analyzed.

## 3.5 Compilation of results

The 7 selected articles were schematized in a table (Table 1) and in addition to the basic references related to authors, year and country, the following data were extracted from each article: topic, participants, context, main results, limitations, future perspectives.

**Table 1**
Studies included in the final review

| Authors | Year | Country | Topic | Type of participants | Context | Main results | Limits | Future perspectives |
|---|---|---|---|---|---|---|---|---|
| Pottier et al. [20] | 2020 | France | Examined the experience of people who have completed the training MOOC: "Obesity Surgery" | 12 women with an obesity surgery project | Healthcare | -the MOOC was an easy way to access information without having to go anywhere;<br>- > possibility to do it at their own pace;<br>- > psychosocial skills | a combination of distance learning and face-to-face meetings can improve quality evaluation of patients understanding and consent | Participants suggested improving the quizzes, giving a greater role to operated patient via testimonies and some other topics were proposed such as physical and psychological changes after surgery |
| Schutzberg [21] | 2019 | United States | Learning experience in MOOCs courses that used the tough love approach | Students of MOOCs courses in analysis and support team | Promotion of active learning | -changes in behaviors of both students and team members;<br>-first time they were expected to bring more to the course than the commitment to follow instructions and ask questions of the instructor | qualitative approach that mainly considers perceptions | Tough love will continue to play a role in future MOOCs providing students with an initial interaction or refresher on active learning and, in addition, allowing the MOOC team to teach more of the course objectives |

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| Jano et al. [22] | 2018 | Malaysiaand United Kingdom | Design a MOOC integrated with PBL (problem-based learning) model for future technologists in the Faculty of Engineering Technology using ADDIE design model | Focus group with comprises 7-10 selected members (10 lecturers; 4 female & 6 male; teaching experience > 10 years | Higher Education | -MOOC scaffolds students' e-learning;<br>-the MOOC has few ways which correspond to ADDIE's teaching model | Despite the great amount of work that are invested in the PBL process and MOOC, the standard structure gives the emotional support to them to proceed and venture into new discovery | The model is beneficial for tutors, policy makers and administrators of MOOC and PBL. Future study should focus on the implementation of this model in classroom |
| Najafi et al. [23] | 2017 | Canada | Understand MOOC design across disciplines with respect to four dimensions: learning outcomes, assessment of learning outcomes, interaction design, curricular content | six Coursera MOOCs from different disciplines supplied by the University of Toronto | Higher Education | -soft MOOCs as learning outcomes emphasized critical thinking, argument development, knowledge construction; -learning outcomes of Hard MOOCs were more concrete regarding discipline-related competencies and skills that the learner would gain by completing the course | Only six MOOCs were analyzed. The study does not include students perceptions and/or self-report evaluations | Examine interaction design in MOOCs to probe the scope and depth of student-student and student-instructor interaction |
| Cinque M. [24] | 2017 | Italy | Analysis of the eLene4work project aimed at defining soft skills useful for the employment market with a focus on digital skills and developing awareness in students to choose the | Students and young workers | Higher education | -the comparison of four MOOCs shows that different tools can be used to promote different engagement models;<br>-each learning practice brings together a combination of these | Most MOOCs are in English language and this may still be a barrier to participation in MOOC learning; MOOC education seems to be used mainly | There is a need to deepen, further, in terms of design, digital inclusion. It is essential that MOOCs increasingly be dynamic systems that can develop increasingly hard-hitting employability skills |

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|---|---|---|---|---|---|---|---|---|
| | | | most effective MOOCs to their training | | | components to create a distinct learning pathway, providing a baseline for rethinking combinations of practices for more effective learning and soft skill development | by those who have already benefited from higher education and for those who are already employed | |
| Poce et al [25] | 2017 | Italy | Design and realize a training module for Educational Sciences students, with the aim of making students develop their teaching skills in the field of cultural and heritage MOOCs implementation | 42 students from the course in Educational Sciences | Higher education | -students independently built a learning course based on innovative museum education issues | the MOOC video, the structure and the design of the educational path;<br>the role of the museum object in the learning path;<br>the enhancement and development of certain skills | In the near future, those students will have to prove to be able to show a series of competences that the educational scientific and academic community, the European Union and the global system strongly demand today |
| MacNeil et al [26] | 2015 | United States | The paper investigates whether a low-stakes model could provide learning benefits when team members collaborate remotely | 53 undergraduate students | Higher education | -learning gains are higher for co-located teams;<br>-the qualitative observations tell a compelling story about the potential of distributed team-based learning | Participants used their technological devices: this allowed good reference to the real world and everyday life, and on the other hand the inability to deal with technical problems | Further research is needed to understand how various factors affect learning outcomes and classroom engagement for low-stakes distributed teams. More work is needed to investigate how specific modalities affect teamwork |

## 4. Results

Results showed several potential benefits of MOOCs on users' soft skills. Specifically, Pottier and colleagues (2020) in their study examined the experience (users' satisfaction and soft skills) of the people with an obesity surgery project who have completed the training MOOC: "Obesity Surgery". This course proposes information about obesity surgery, simultaneously targeting patients, HCPs (healthcare proxy), and information-seeking persons. It lasts 5 weeks and includes 9 videos telling the story of 3 characters (2 in a surgical journey and 1 not wishing to be operated) and 9 videos with experts delivering validated information. With regard to the method of assessment, quizzes evaluate the learning and a forum for exchange between participants and with experts was available. Results from this study showed that all participants perceived the MOOC as positive and useful, it responded to thier expectation for knowledge about bariatric surgery and to their own questions. In addition to acquiring new knowledge, the training permitted the acquisition of new psychosocial skills: participants felt more inclined to interact and communicate with their caregivers and their family about obesity and bariatrci surgery. Moreover, the knowledge acquired promoted the adoption of positive self-management behaviours (e.g., active posture) for obesity in general and the surgery preparation. In addition to this, Jano et al. (2017) designed a MOOC integrated with PBL (problem-based learning) model for future technologists in the Faculty of Engineering Technology using ADDIE design model. PBL is an innovative approach which help students to enhance essential skills like independent learning and problem solving while the ADDIE design model represents an approach which comprises several phases: *analysis phase* - analyzing the needs and constraints, learning environments, learning objectives, new skills and the learners' current level; *design phase* - outlining strategies to reach the instructional goals; content subject matter experts, user experience, assignments, tests, graphics and media - interview and content analysis method; *development phase* - creating the course which is aligned with the blueprint from the design phase; *implementation phase* - implementing the course; *evaluation phase* - measuring the effectiveness and efficacy of the training. formative and summative approaches are used. PBL starts with a trigger on an issue and learners work collaboratively to explore the issue in depth, execute independent learning, share information in groups, apply presentation and writing skills as well. PBL required students to use several skills like critical and creative thinking, communication and interaction in team, discussion and appreciation for alternative viewpoints, decision-making, self-evaluation and independent learning. Also, Najafi and colleagues (2017) tried to understand MOOC design across different disciplines. Specifically, they analyzed the design of six Coursera MOOCs of the University of Toronto, with respect to four dimensions: learning outcomes, assessment of learning outcomes, interaction design, curricular content. Results from their study showed that soft MOOCs (e.g., humanities, education) as learning outcomes emphasized critical thinking, argument development, and knowledge construction, all competencies that can be applied beyond a single course or degree program. Learning outcomes of Hard MOOCs (e.g., natural sciences, engineering) were more concrete and regarded discipline-related competencies and skills. Yet, critical thinking was not excluded from hard MOOCs. With regard to curriculum and content, hard MOOCs represented expert knowledge and promoted mastery of concepts and professional skills. Soft MOOCs, instead, juxtaposed several viewpoints and promoted a critical stance towards learning. Poce et al., (2017) design and realize a training module for Educational Sciences students, with the aim of making students develop their teaching skills in the field of cultural and heritage MOOCs implementation. The main objective was to let students independently build learning courses based on innovative museum education issues and evaluate the quality of online digital resources addressed to any external users but especially for future educators. Moreover, the course also proposed individual peer evaluation. The rationale behind this activity is that the students develop metacognitive reflections on the learning process they outlined as well as on the multimedia materials produced. With regard to skills evaluation, collaboration and creativity have been introduced in every MOOC designed by the students: teaching and learning methodologies based on cooperation and the creation of new products are fundamental in every primary school curriculum. Especially creativity is the competence able to get children closer to the world of art, thanks to its richness of emotions and experiences. It is not surprising therefore that students of educational sciences stress such aspect in the teaching and learning paths conceived in the module. Critical thinking has been taken into account by a significant number of groups, in terms of facilitating the reasoning of the pupils in terms of complexity and globalization using an interdisciplinary approach.

Finally, in the contribution by MacNeil, Latulipe and Yadav (2015), learning in distributed low-stakes teams is analyzed. Specifically, it was analyzed whether low-stakes teams communicating via Google Hangouts can provide educational benefits, in terms of engagement and learning outcomes, compared to students who are learning via video in a co-located environment or individually. Quantitative results showed that learning gains are higher for co-located teams and do not support the initial hypothesis that distributed teams would outperform individuals. It turned out that distributed teams offer latent benefits such as opportunities for networking or social interaction, ability to observe and imitate other students' techniques for self-regulated learning, and multiple perspectives for solving more difficult problems. These examples show how participants can work together to find ways to mitigate and even technical difficulties that arise. They suggest that students could feel more connected and create networks of interaction among students who share ideas and maintain those interactions beyond the course. The fact that distributed teams performed similarly to individual teams is promising. Working in teams allowed students to interact socially and develop soft skills, such as self-regulation, teamwork and peer learning. The studies screened above showed that MOOCs structure can have important secondary outcomes in terms of users' soft skills enhancement. However, there are also MOOCs specifically created to promote users' soft skills in terms of contents. The study of Cinque (2017), for example, analyzes the relationship between MOOCs and soft skills through the eLene4work project. One of the main outcomes of the project refers to the construction of a guide aimed at effectively leading the choices and uses of MOOCs for training. The analysis of 151 MOOCs on soft skills and the qualitative comparison of four creative MOOCs showed that there are several elements that can support the instructor in planning processes related to creativity and diversity, such as: adaptability, teamwork, problem solving, creativity, and innovation. Thus, it was highlighted how having an understanding of diverse learners and the factors influencing participation can help MOOC developers to ensure the success of MOOCs and the development of new skills.

The last studies by Schutzberg (2019) pointed out the role of instructors. It promotes tough love as an approach to interaction aimed at promoting responsible behaviors of students. The team composed by instructors and designers used tough love to push students to be active learners and, specifically, to seek answers to their challenges independently and/or through peer support. Tough love approach has changed the behavior of both students and team members who implemented a scaffolding approach in sustaining students' independence and coping skills in solving problems.

## 5. Discussion and Conclusions

In today's industry employers demand soft skills like problems solving, creative thinking, adaptable and flexible components. Thus, with the advent of industry 4.0 students are required to be equipped with content knowledge, competence, long-life learning skills and self-learning skills to reflect advanced technologies. This is especially true in Italy because the high levels of unemployability have made it necessary for them to acquire new skills that could help them to be more appealing than other candidates [27]. Thus, compared to the past, hard skills alone are not enough to reach big-status careers [28]: hard abilities, like intelligence quotient, accounted only for 20.0% of the educational training effects on employment outcomes because other skills contribute to drive work success [29]. According to these data, research showed that success in life depends not on the "general knowledge" achieved through school but on factors such as, for example, conscientiousness and curiosity (see Heckman & Kautz [30] for a review). Highly soft skilled persons, indeed, show more energy, passion in their job, and career engagement [31] as well as they seem to be more protected from work-related diseases (e.g., burnout; [32]. Based on this evidence, the European Commission [33] recently recommended reforming school and university curricula, finding teaching strategies that may effectively educate students in both knowledge-based disciplines and the so-called soft skills [34].
The main results of our scoping review have shown that MOOCs can both directly and indirectly enhance students' and users' soft-skills. The promotion of the MOOCs phenomenon is rapidly developing on a large scale, demonstrating the educational potential of a teaching technique which,

apparently, has no limits. While several MOOCs have been created focusing specifically on the enhancement of soft-skills in terms of contents [34], others [22; 23; 25; 26] thanks to their structure (including activities during the courses that foster cooperative learning, decision-making, problem solving, communication etc.) were able to promote students' soft skills as secondary outcomes. In this sense, of particular interest is the study by Pottier and colleagues who implemented a MOOC on obesity with a secondary improvement in participants' health communication skills and psychological soft-skills. Finally, the work by Schutzberg [21] points out also the important role of MOOCs' instructors. In this study, indeed, instructors modified their general attitude according to the though love approach, to foster students' independence, especially in solving challenges issues.

These findings shed light on the important role that academic learning science centers can play in training instructors and students in enhancing their soft skills. Specifically, the results of the present scoping review highlight the need to create distinct learning pathways for students to promote a more effective learning and soft skill development necessary for the future access to the labour market. In the near future students, indeed, will have to prove to have a series of competences that the educational scientific and academic community, the EU and the global system strongly demand today.

The findings of this review should be interpreted in light of the limitations of our own work. First, we only assessed the English-language literature, and may, therefore, have overlooked significant findings reported in other languages. Second, considering that we have conducted our research only through Scopus and that we have not taken into account the grey literature, it is possible that relevant studies were not retrieved. Third, although we attempted to thoroughly screen the retrieved studies, again it is possible that some salient studies were overlooked.

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