Introduction
Scenarios for the University of the Future

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The development of digital technology is contributing to a significant transformation of traditional categories of knowledge, culture and professions. New technologies have radically reconfigured how consumption and cultural practices spread, redefining the boundaries of traditional markets. This reconfiguration has affected both public and private spheres, as well as the collective and individual imagination. It has contributed to the definition of new forms of communication and social interaction in the various economic and cultural environments.

This volume focuses on the relationships between technological and social innovations, and the new opportunities and challenges that gather around training. It focuses on digital and entrepreneurial skills, with particular reference to the experience of Contamination Labs (CLabs) launched in Italian universities from 2013, intending to promote a culture of entrepreneurship and innovation aimed at founding and supporting new startups. CLabs are educational and creative laboratories that consider technological and cultural transformations that affect the world of work and knowledge. It is assumed that these changes require interdisciplinary skills and professional skills, which are becoming less sectoral. *Contamination* is a controversial word in languages other than Italian, where instead represents the cross-fertilization: the crossover between different disciplines and between the academic and business worlds is key to the CLab training model, which is based on the opportunities offered by digital technologies, the development of scientific and applied research, and the creativity of youth. The theme of creativity is central to the analysis that this book offers, both in terms of new scenarios that are characterized by technological development and the new economy, and also in terms of the social and cultural changes that accompany the significant transformations that are taking place.

In general terms, the analysis tries to explore the links between possible educational opportunities and contemporary social, economic and cultural contexts. It studies scenarios that feed on innovation, creativity and connectivity. Furthermore, changes in the productive, professional and work spheres cannot be understood without preliminary reference being made to the influence that digital technologies and digital culture have on contemporary societies. This begins with the collaboration and networking processes that characterize the new media and is not remain confined to the use of technology, but represents the basic units of "network society," as noted by Manuel Castells (2000).

This work focuses, therefore, on the changes introduced by the spread of new digital technologies within the framework of cognitive and social changes, with special reference to the world of university education. The areas that characterize Industry 4.0 and in general the growing digitalization of the economy, such as the spread of big data systems and the Internet of Things, the digital means of production and the development of artificial intelligence and robotics, require new skills and abilities to manage different innovation processes, in addition to defining new growth opportunities. The book explores these issues by proposing a reflection on educational innovation that is necessary in the contemporary world, highlighting the cultural and cognitive significance of technological transformations. It is an indispensable reference framework for addressing the new skills that are required and necessary in changing professional and social contexts.

Technological opportunities play a fundamental role and guide unprecedented levels of economic competitiveness, and they require different skills. Nevertheless, it is not simply a question of knowing how to use new machines. As highlighted in a report of the World Economic Forum (2016) dedicated to the future of jobs, the socioeconomic changes that characterize the global context and the so-called Fourth Industrial Revolution create new occupations, while some jobs are threatened by redundancies and existing jobs are undergoing changes in the skills required to do them.

Social and collaborative skills will be increasingly sought after, and must necessarily accompany technical skills. According to the report, the role of critical thinking and creativity will increase—alongside problem-solving, which will remain the most requested competence.

The cultural and technological transformation also points towards an economic and productive dynamic that values ideas, digital skills, a crossover of areas and sectors, professionalism, the spirit of initiative and the ability to seize various opportunities that are offered by the most immediate possibilities of production and creation. These changes involve all levels of education and many levels of organizations and methodologies. The digitization of economic processes accompanies and nurtures an entrepreneurial vision that gives young people a promise to be able to turn their ideas into projects. Beneath this promise lies a set of skills that can be defined in the area of entrepreneurship, including some of the so-called soft skills and digital skills. The promise is based on the ability of educational institutions to promote and train, among other things, the entrepreneurial, digital and soft skills necessary for innovation and to manage the challenges that change brings with it. Teaching models are renewed, starting with network culture, which is now widespread on a cultural and social level. This involves the models of openness that characterize it, as well as the creative and connective thought that can translate into innovative practices.

In the context of these transformations, CLabs, promoted by the Ministry of Education, University and Research (MIUR) and the Ministry of Economic Development (MISE) and experimented with in various Italian universities, were born to stimulate a culture of entrepreneurship and innovation, through educational models based on cross-pollination between educational institutions, entrepreneurs, investors,

young people, companies and the world of research[1]. In this sense, the potential for interweaving education and business is central. The dissemination of digital and entrepreneurial culture represents the premise and the objective of the proposed training model, and constitutes its terms of reference based on the logic of the network, on openness and on collaboration. This dissemination nourishes training and the development of new business ideas.

On the economic side, the intervention aims to boost the market and encourage the creation of new startups, which are known to enhance the research–innovation–entrepreneur relationship.[2] On the educational side, the CLabs intend to renew the university model through a greater connection with the economic and business world, with the additional aim of correcting the misalignment between the training system and the economic system, highlighted (among other things) in the McKinsey report of 2014; this draws attention to the distance between human capital formed by Italian educational institutions and the needs of the country's economy. The development of digital technologies is the framework of the renewal that CLabs consider to be desirable, on the dual cultural–cognitive and productive–economic front.

This book focuses, as has already been pointed out, on the intertwining of training and entrepreneurship that animates the CLabs. In particular, it explores the case of CLab Naples, which has been promoted by the Department of Social Sciences at the University of Naples Federico II.[3] This CLab is presented as an example and as the inspiration for a new didactic model, taking into account its characteristics of

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[1] The CLab, born in 2013 from a collaboration between MISE and MIUR, introduced departments at the Universities of the Convergence Objective Regions (Campania, Puglia, Calabria, Sicily) that focused on educational innovation around entrepreneurial vocation. The first experiments in Italy involved the University of Reggio Calabria, the University of Calabria (Cosenza), the University of Catania and the University of Naples Federico II. The four pilot projects were carried out in the two-year period 2014–2016 and four CLabs created as a result of the Bando MISE–MIUR were joined by four other initiatives financed through self-funding by the Universities of Cagliari, Trento, Cattolica del Sacro Cuore (Milano) and Politecnico delle Marche (Ancona). After the first encouraging results, the Ministry of Education agreed to the extension of the initiative into the three-year period 2017–2020, involving a total of 17 Italian universities.

[2] Startups must have the development, the production and the marketing of innovative products or services with high technological value as their exclusive or main social object; in addition, they must meet at least two of the following requirements: (a) expenditure on research and development; (b) employment of PhDs, PhD students, researchers and postgraduate students among their staff; (c) hold at least one patent.

[3] CLab Naples was promoted by the Department of Social Sciences of the University of Naples Federico II and had Derrick de Kerckhove and Lello Savonardo (the University's contact person and the Rector's delegate for the project) as scientific coordinators, while Annalisa Buffardi and Claudio Luongo were Project Managers. Furthermore, Carla Langella and Rosanna Veneziano (two of the authors of this book) were responsible for teaching, while Rosanna Marino was a tutor and contact person for the communication activities. The project was a collaboration with the Civil Engineering, Design, Building and Environment department of the Second University of Naples, with the Assessorato ai Giovani, Innovation and Creativity of the City of Naples and the Fondazione Idis-Città della Scienza of Naples, and has developed a network of over 40 partners from the world of enterprises, institutions and the startup ecosystem.

openness, cross-pollination, creativity and networking. At its foundation is a mission to train new skills and promote the creation of innovative companies and startups.

CLab Naples aims to enhance local skills and to respond to the demand for innovation in the entrepreneurial, cultural and social context of Campania. The connection with this region represents one of the fundamental assets of CLab Naples, and it affects the project's attitude to social innovation and cultural and creative industries. The CLab experience indicates that an interesting response to transformations in the new economy's training system is possible. Nevertheless, the creation of innovative startups is only one of the CLab objectives. Understanding the processes and dynamics that accompany the spread of new technologies is also one of the main elements of the training policy, starting with the cultural dimension of the changes that are underway.

The startup projects presented in this volume show how CLab Naples connects traditional educational systems with a new culture of entrepreneurship, in which innovation also allows for technological development in the context of a new training model. Taking this perspective, in 2016 the University of Naples Federico II promoted a study day involving the different Italian CLabs, in agreement with MIUR, MISE and the Conference of Italian University Rectors, to reflect on new training models for universities of the future. The CLab Italy event included a codesign session during which coordinators and students shared their points of view on the activities carried out, highlighting the strengthening and critical factors. The results of this codesign session contributed to the drafting of a proposal for Guidelines (CLab Naples 2016), which was merged into the subsequent project promoted by the Ministry of Education for the implementation and development of new CLabs in Italian universities. These Guidelines confirm the main directives that relate to the principle of sharing skills and knowledge, as it concerns the needs and opportunities expressed by local, European and international regions, as well as the new economy and market, thus promoting the circulation of ideas between the academic and research world, the productive world and the startup ecosystem. The shared development of ideas and the ability to connect and network with entrepreneurial realities and communities of interest, which characterize the so-called CLabber projects, are an example of this. As Gershenfeld (2012) states, ideas and projects circulate in a process of sharing between disciplines, relationships and skills.

In this scenario, the university has a central role in discovering transformations and identifying ways in which new knowledge and skills can be promoted, regenerating training models and enhancing youth creativity. CLab Naples has also developed through the instigation of new projects, which are promoted by the Osservatorio Territoriale Giovani (OTG)of the Department of Social Sciences at the University of Naples Federico II.[4] These share methodologies, and adopt teaching methods, training

[4] The OTG, coordinated by Lello Savonardo, has been observing and researching the condition of young people in Italy since 2003 (www.giovani.unina.it).

and an overall cultural approach that will generate new entrepreneurial opportunities among the young participants in different sectors.

In particular, the *Startup Music Lab* project takes up the challenge of creating a new model of training in the music field, presenting itself as a connecting tool between young artists (writers and performers), businesses, and cultural and creative institutions, providing a system of interpretation and various tools that enhance different forms of youth creativity, thereby promoting cultural entrepreneurship, in part through the use of digital communication technologies. The course is aimed at young artists living in Italy and began in March 2017 in response to a public announcement by the Italian Society of Authors and Publishers (SIAE) and the Ministry of Cultural Heritage and Activities and Tourism (MiBACT).[5] The aim of this was to form, in participating subjects, a corporate artistic culture. This would develop, enhance and optimize the creative and expressive abilities of young people, promoting entrepreneurship by connecting the Italian music, recording and production system with the creative and cultural industry and various other connected segments.

The *Creative Lab Naples* project, on the other hand, was established in 2018 through the coordination of the OTG, and represents a training and laboratory-based approach.[6] It aims to increase the autonomy of young people under 35 and to develop their creativity, promoting their talent and favoring confrontation with the world of business and culture in Naples. Through interdisciplinary laboratories, Creative Lab Naples promotes new skills and entrepreneurial skills, addressing the challenges of Industry 4.0 and promoting the development of social and cultural startups, with reference to social innovation and the film and music sectors.

This volume begins with preliminary analysis and sets out a theoretical framework on the theme of innovation, digital technologies and the changes that the global economy is going through, these being characterized not only by the growing development of innovative startups but also and above all by the emergence of new skills.

In Chapter 1, Lello Savonardo focuses on the social and cultural transformations that are affecting contemporary societies in the digital age, with particular reference to technological innovations, software cultures and emerging professional skills. The chapter opens with a reflection on the processes of innovation and the theme of creativity, considering the predisposition of younger generations to interpret the signs of change as progress. A central element of this is digital technologies, which are radically transforming socialization and our relationship with the traditional categories through which we interpret the world, thereby generating new cultural and economic scenarios. These in turn foster the emergence of previously unimagined professions,

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[5] "Sillumina—Private copy for young people, for culture—Notice 3 Artistic Residencies and Training in the Music Sector," promoted in 2016 by SIAE and MiBACT.

[6] The course is carried out in collaboration with the Idis-Città della Scienza Foundation, Mad Entertainment spa and Ufficio K Srl. The initiative is promoted by the Department of Youth, Creativity and Innovation of the City of Naples, leader of the partnership of the "Na.Gio.Ja._Costruiamo opportunità," financed by the Campania region.

and new skills are needed to address changes that affect the present and future economy as well as the professional world.

In Chapter 2, Francesco Pirone focuses attention on the theoretical reasons why the generation of new business ideas and the emergence of innovative startups have become increasingly important in our interpretation of business demography as it concerns economic growth. The chapter explores the concept of entrepreneurship in contemporary sociological theory and the role of cultural institutions that value entrepreneurial self-activation, the capacity for innovation and the value of connectivity between companies. In this framework, the author discusses the presuppositions and perspectives around the scenario in which micro-enterprises and innovative startups can develop.

In Chapter 3, Vincenzo Luise investigates the multiple definitions of the term startup, starting with the model that is common in the collective imagination and linked to the experience of Silicon Valley. However, the widespread imagery that evokes nuclei of young entrepreneurs engaged in creating innovative products and services hides the complexity of the startup economy. Starting from this premise, the author returns to startups' operational and regulatory framework, and considers the multiplicity of approaches that focus on how it is possible to start a new business, proposing an overview of the different development methods and practices.

Annalisa Buffardi focuses in Chapter 4 on the contemporary dynamics that characterize cultural, social and economic change, these being oriented towards a new educational pattern model that will enhance new skills and train the worker and the citizen of the future. Networking and "making" represent two features that are made possible by the diffusion of new media that characterize contemporary culture. There is a widespread orientation towards network logic, to the idea that for designing and doing there is a connection between individuals, artifacts and technologies. The chapter recalls some elements of cultural change that are accompanied by the spread of new technologies, and, around the theme of entrepreneurial skills, presents a model of creative labs as a possible educational scenario that incorporates contemporary culture.

In Chapter 5, Carla Langella and Rosanna Veneziano illustrate the training and organizational model proposed by CLab Naples, through the presentation of a training path, and its actors, tools and innovative approaches. The chapter delves into the theoretical framework that animated the birth of CLab Naples and the path that led to the generation of its training model, together with the definition of innovative entrepreneurial areas, the cross-pollination that characterized teaching practices, and the collaboration between students, tutors, mentors, entrepreneurs and institutions. The authors also return to the centrality of the CLab's cultural values, which are a constraint and a resource for entrepreneurial practices and the training project.

Chapter 6, by Rosanna Marino, presents the main results from CLab Naples, between 2014 and 2016. After monitoring its activities, the author reports the most relevant findings concerning the CLabber community and the business projects that were developed, characterized by strong local roots and an intense technological and social vocation. In particular, the chapter focuses on best practices; that is, the entre-

preneurial initiatives powered by CLabbers that excelled and turned into innovative startups, micro-enterprises and successful non-profit organizations. The description of these emerging realities traces the genesis and development of the business idea, the composition of the interdisciplinary team and the activities carried out.

In Chapter 7, Stefania Sansò focuses on the relationship between the university and productive systems, beginning with a new conceptualization of the work and professions of the 21st century. The chapter introduces the new training models that can foster the development of soft and hard skills and guarantee their continuous updating, in parallel with the direction in which the labor market is moving. The specific example addressed is the Apple Developer Academy training course, which began after a conversation with the scientific director of the project, Giorgio Ventre. The Academy, founded in 2016 after an agreement was made between the University of Naples Federico II and the multinational Apple Inc., has the objective of developing a training course that is free from traditional university methods and is open to young people who are not enrolled in graduate courses. The aim is to promote advanced and globally competitive training in the field of digital technologies. Like CLabs, this training experience constitutes a virtuous bridge between research and business, training and the market, laboratory and country, creative innovation and the development of digital technologies. The Academy opens the doors of traditional knowledge to knowledge that is based on experience, designing new scenarios for the universities of the future.