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Management Conference



Tertiarization & sustainability new challenges for management in the digital era

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Tertiarization & sustainability. New challenges for management in the digital era

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Short Papers

edited by

Arabella Mocciaro Li Destri, Marta Ugolini and Lara Penco

SUMMARY

Track 1 - Artificial Intelligence in Management

<i>AI adoption in the workplace: Cognitive and Emotional Appraisals</i> GIULIA GOGIALI, FABIOLA SFODERA, ANDREA LAUDADIO, LUCA DEZI	PAG.	3
<i>How self-verification experiences and self-concept clarity jointly shape job applicants' responses to AI</i> VALERIO DERIU, MARTINA DI CIOCCIO, ANDREA MONTEFUSCO	“	9
<i>Data Discrimination and Algorithmic Challenges in AI copilots. A systematic literature review</i> CARMELA ELITA SCHILLACI, FEDERICO MERTOLI, LUIGI PIPER, LUCREZIA MARIA DE COSMO, GIANLUIGI GUIDO	“	15
<i>Lights and Shadows in the Governance of Generative AI Firms: a preliminary approach</i> FRANCESCO LAVIOLA, ROBERTO ARGIOLAS, CARMELA DI GUIDA	“	21
<i>Il Web3 incontra l'AI. Verso nuovi modelli di business decentralizzati e generativi</i> FRANCESCO FASANO, CHIARA BARTOLI, FRANCESCO CAPPÀ, ENZO PERUFFO, PAOLO BOCCARDELLI	“	29
<i>The Future of Education: reframing skills and learning in the age of artificial intelligence</i> CHIARA BARTOLI, FEDERICO CESCHEL, LORENZA GERARDI, LUCIA MARCHEGIANI, ENZO PERUFFO	“	37
<i>Leveraging AI for Internationalization: The Role of Artificial Intelligence in the Global Expansion of Italian Startups</i> NOHAILA KARTTI, CHIARA CANNAVALE	“	43
<i>The Role of International Knowledge in China's Artificial Intelligence Ecosystems</i> JACOPO CRICCHIO, SAVERIO BARABUFFI, ALBERTO DI MININ	“	49
<i>Generative Artificial Intelligence in the healthcare ecosystem: a game-changer for performance measurement</i> ANNA BASTONE, FRANCESCO SCHIAVONE, DANIELE LEONE, ANDREA GARGIULO	“	55
<i>Human-Based vs. AI-Based Diagnosis for Anamnesis Tertiarization: The Roles of Patients' Psychological Adaptation and e-healthcare Ethical Concern</i> ANDREA SESTINO, SIMONE GUERCINI	“	61
<i>L'impresa del post-umano: il lato oscuro della transizione digitale nelle dinamiche aziendali</i> PAOLO BARILE, GERARDO BOSCO, RAFFAELE D'AMORE	“	67
<i>The Intelligence Gap: Merging Explainable AI with Managerial Perception for Proactive Crisis Strategy</i> DAVIDE LIBERATO LO CONTE, GIUSEPPE SANCETTA, RAFFAELE D'AMORE	“	75
<i>Stakeholder Engagement and Social Sustainability Practices in Innovative Italian SMEs: The Mediating Role of Artificial Intelligence</i> LORENZO TURRIZIANI, VINCENZO DELL'ANNO, CRISTINA CERVINO, VALERIO MUTO	“	83
<i>Using Artificial Intelligence for Improving Sustainability in Smart City</i> ANGELO RIVA	“	91
<i>The Circular Revolution Is Served: AI Strategies for Sustainable Competitive Advantage</i> MAURO SCIARELLI, ANNA PRISCO, MARTINA PERCUOCO, VINCENZO DELL'ANNO	“	95
<i>Donor preferences between search engines and Large Language Models (LLMs): Transforming donor decision-process in non-profit fundraising</i> ALESSANDRO SIGNORINI, ALESSANDRO FERI	“	101
<i>AI tra impatti di (post) management e decisioni verso trans-disciplinarietà e algoretica</i> LUCIANO PILOTTI	“	107

<i>Transizione circolare nella gestione dei rifiuti tessili nell'Unione Europea. Barriere sistemiche ed opportunità strategiche</i>	PAG.	947
Alice Guzzetti, Valeria Belvedere		
<i>Developing a Capabilities Matrix for Agri-Food Companies in Piemonte</i>	“	953
Dario Peirone, Judy Yueh Ling Song		
<i>Optimizing transportation management through product feature forecasting: a Design Science approach</i>	“	959
Alessandro Rizzotti, Ivan Russo, Jan Holmström		
<i>Unveiling Omnichannel Strategy Dynamics through Topic Modeling Methodology and Fuzzy-TISM Analysis</i>	“	969
Francesco Russo, Marco Romano, Vijay Pereira		
<i>“Online or offline? That is the question”. The wine distribution channels dilemma</i>	“	975
Fabrizio Baldassarre, Savino Santovito		
<i>Assuring Supply Chain Resilience in the aeronautic industry: a Total Cost of Ownership perspective</i>	“	981
Barbara Gaudenzi, Alessandra Cozzolino		
Track 13 - Sustainability		
<i>Implementing ESG Criteria in Italian SMEs: Regulatory Challenges and the Role of Innovative Digital Tools in the Context of the CSRD Directive</i>	“	989
Giovanni Spatola, Mario D'Avino		
<i>Unpacking ESG performance and the relation with green innovation: the moderating role of board cultural diversity</i>	“	993
Elisa Fiore, Jordana Rech Graciano Dos Santos, Roberto Urbani		
<i>Understanding the Interplay Between ESG Performance and ESG Controversies: A Quadrant-Based Framework</i>	“	999
Emilia Filippi, Alice Alosi		
<i>Corporate purpose and sustainability: Do SDGs references in Purpose statements influence ESG performance?</i>	“	1007
Lucia Barra, Adele Parmentola, Michele Costagliola Di Fiore		
<i>The Impact of Green Training on Workforce Behavior, Environmental Performance, and Reputation: A European Study</i>	“	1013
Giulia Alessandri, Fabio Iannone, Annamaria Pesci, Tiberio Daddi, Fabio Iraldo		
<i>Control Points Perspective in Environmental Business Strategies: Corporate Roles in Shaping Sustainable Markets</i>	“	1019
Vittorio Maria Garibbo, René Bohnsack, Francesco Rizzi, Eleonora Annunziata, Marco Frey		
<i>Trusting Green Energy: How Social and Emotional Value Drive Peer-to-Peer Energy Adoption</i>	“	1031
Domenico De Fano, Rosamartina Schena, Angeloantonio Russo		
<i>On a mission to get funds: the demand for venture capital of impact oriented ventures</i>	“	1037
Valentina Lo Mele, Anita Quas, Stefano Romito, Clodia Vurro		
<i>Understanding Paradoxical Thinking in Corporate Sustainability Antecedents, Processes, and Outcomes</i>	“	1045
Giovanni Gesiot, Alice Alosi, Francesco Rizzi, Eleonora Annunziata, Marco Frey		
<i>Assessing costs and benefits of a Nature-based Solution through a triple bottom line and participatory approach.</i>	“	1051
Giorgia Condomitti, Maria Rosa De Giacomo, Sara Tessitore, Marco Frey		

The Impact of Green Training on Workforce Behavior, Environmental Performance, and Reputation: A European Study

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Abstract

The challenges of digitization, the green transition, and demographic trends in Europe have significantly impacted the labor market. In particular the request of green talent from the demand side has grown enormously, making mandatory to reskill and upskill the workforce to address the green skill gap. In this scenario employees' green training, a key element of Green Human Resource Management (GHRM), has become fundamental to align employers requests and employees working profile availability. This study examines the impact of green training for the existing workforce in the European business context, focusing on its influence on the green working climate and its mediating role in enhancing firms' environmental performance and green reputation, enabling organizations to anticipate green trends, driving the transition. The paper explores the role of green training through an online survey, focused on the agri-food, construction, manufacturing, wood and furniture industries, and public administration, strategic sectors within Europe. Findings indicate that green training positively contributes to fostering a green working climate within the surveyed European firms, reinforcing the importance of structured training programs in supporting sustainability-oriented business practices. Moreover the study indicates that green working climate positively impacts on firm environmental performance and green reputation.

Framing of the research. *The recent challenges imposed by digitization and green shift, as long with the European demographic trend, have impacted deeply different dimensions of society, including the labor market (Cedefop, 2024). The effect has been witnessed by drastic changes in terms of demand and offer of job opportunities, as well as the increase of the labor shortage (Innerhofer, Nasta and Zehrer, 2023) that has affected different European sectors. Moreover, the assessment of the impact of green transition on the labor market is made more difficult by the geographical distribution of workers (Vona, Marin and Consoli 2018; Dussaux, 2020), the dependence of countries 'GDP on high polluting industries, the classification used to define the concept of green jobs and the level of labor intensity of the industries majorly impacted by the transition (Causa et al., 2024). Between all these issues, what stands out is the general unalignment between employers' requests and employees working profile availability (Linkedin Report, 2023), along with the necessity to address the recurrent green skills gaps requests (Renfors, 2024) to satisfy the requirements imposed by the green transition. Moreover, the necessity to achieve the ambitious climate targets imposed by public institutions without compromise the general wellbeing and potentially expose the current workforce to vulnerability, makes mandatory to adequate the skills requests to the new policies (Borgonovi et al., 2023). Understanding the skills needed for reskilling and upskilling in low-emission economies is crucial for workforce redistribution (Draca et al., 2021). Equally important is assessing the gap between required and existing skills to determine reallocation costs (Gathmann and Schönberg, 2010; Kambourov and Manovskii, 2009). Redefining workers competences is essential for labor market resilience, reducing vulnerability to external forces and market fluctuations (Borgonovi et al., 2023). This requires considering job obsolescence, supply chain pollution levels (Vandeeplas et al., 2022), and sector-specific impacts. According to recent studies the request of green skills from the demand side has grown enormously (Nikoloski et al., 2024; Sulich and Soloducho, 2022) aligning with the policy makers objectives and following the trends imposed at European level by Agenda 2030, the Sustainable Development Goals (SDGs), the European Green Deal, the Fit for '55 directive, the Net Zero industry Act for decarbonization, and the revision of the Waste Framework Directive in 2024. Moreover, the requirements imposed by green transition will have a neutral or generally positive quantitative impact on the labor market (Business Europe 2021), even if some sectors would be dramatically impacted because of the increased*

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sector mobility towards more “green friendly” ones. Despite this, it is difficult to define a worldwide general employment trend since labor market policies vary widely across countries (Chateau, Saint-Martin and Manfredi 2011). However, what stands out is that, despite the optimistic forecasting, there has been a significant misalignment between the demand for green skills from employers and the availability of skilled workers over the last 5 years (Global Green Skills Report, 2022). Without this adjustment the gap between demand and offer of green talents is expected to grow globally even higher until the 101, 5% by 2050 (Ferrazza, 2025). Moreover, the adaptation process to the new requirements imposed by green transition is made even slower by the difficulty of the employees to acquire adequate expertise and knowledge to improve the level of sustainability of organization performances and products (Pinzone et al., 2019). For these reasons Green Human Resource Management (GHRM) plays an important role in supporting firms in the achievement of a green transition. GHRM has been analyzed, in the hospitality industry, through the lenses of Resource Based View (RBV) theory and Stakeholder theory, revealing a correlation with circular economy and consequently with green organizational culture, and internal and external resilience and witnessing its role in promoting long term firm sustainability (Elshaer et al., 2024). GHRM is associated to programs, techniques and processes that are implemented in the workforce tasks to reduce negative environmental impacts and achieve a better environmental performance (Arulrajah et al. 2015). This aim is reached thanks to the three major component of GHRM: selection and recruitment, training and development, compensation and rewards (Zihan et al., 2024). According to Jackson et al. (2011), training and forming employees is a key component of GHRM especially in the middle of a change process, associated to green and digital transition, like the one Europe is currently facing.

Our analysis is focused on green training component based on the Human resources studies related to the AMO Framework (Marin-Garcia and Tomas, 2016), which shares a common foundation with GHRM (Vasquez Brust et al., 2022). The AMO acronym that stands for Ability, Motivation, Opportunity Theory originally developed by Bailey (1993), refers to the components that are considered essential to promote the high involvement and high-level performances of employees inside a firm. The first dimension, ability, is related to the owning of knowledge and skills that lead to the correct performing of a certain job. This can be enhanced by specific recruitment techniques and selection, development and formal training (Raidén et al., 2006). Green training can be defined as a type of training that is related to relevant environmental topics, which lead the staff to the integrations of firm’s performance with environmental issues (Teixeira et al., 2016). It is also a process of continuous education that aims to increase employee’s ability to acquire environmental sustainability knowledge and develop a spontaneous green behavior over time (Liu et al., 2020). The correlation between GHRM and firm environmental performances has already been deeply explored in academic South Asian literature (Ren et al. 2018). Wu et al., (2020) have highlighted that organization that adopt an Environmental management system obtain significant economic benefits. The ability to create an internal culture based on skilled and engaged people completely committed to the environmental cause and aligned with firms’ main goals inevitably leads to an elevated environmental performance through the promotion of shared green behavior (Sarfo et al., 2024).

Purpose of the paper. The present study explores the impact of green training that involves current workforce, inside European business context, on green working climate (GWC) and the mediating role of this dimension in promoting better firms’ environmental performances and better firms’ green reputation addressing the needs imposed by green transition. The paper aims to assess the efficacy of green training in promoting the resilience of firms and help organization achieve better performance by anticipating the green trends and assuming a pivotal role in the promotion of the transition. The research focuses in particular on agri-food, construction, manufacturing, wood and furniture industries and Public administration, that are strategic sectors of the variegated European business tissue and that are targeted inside the survey used to gather data. Despite the evident necessity of green skills to perform a long-term transition and adaptation of traditional business both public institutions (OECD/CEDEFOP, 2024) and academic researches (Xie et al. 2020) have portrayed a specific scenario of misalignment between demand and offer on the labor market that can be potentially fulfilled by green training. From an institutional perspective and considering existing research gaps, this paper examines whether green training, a key component of Green Human Resource Management (GHRM), enhances firm resilience by directly shaping the internal climate. As the primary beneficiaries of this process, employees contribute to a GWC, which serves as a mediating factor for firm performance and reputation. According to our hypothesis the paper aims to address the following questions:

RQ1: How much green training influence firm’s internal working climate fostering workforce green behavior?

RQ2: How much green working climate mediates the impact of green training on environmental performance of firms?

RQ3: How much green working climate mediates the impact of green training on green reputation of firms?

The research questions correspond to three major hypothesis, following detailed. The implementation of clean environmental strategy must be supported by an adequate green human resource management and consequently an important training system that can create an internal GWC and engagement (Cherian and Jacob, 2012). For this reason, the first hypothesis is: H1 Green training positive influences GWC.

A recent study (Sarfo et al., 2024) has shown a significant correlation between the adoption of GHRM practices and firm environmental performances. What stands out is that the acquisition of new knowledge and specific competences related to environmental sustainability topics can lead to an enhanced and higher competitiveness of the organization (Obaid, 2015). The ability to create an internal culture based on skilled and engaged people completely committed to the environmental cause and aligned with firms’ main goals inevitably leads to an elevated environmental performance

through the promotion of shared green behavior (Sarfo et al., 2024). For this reason, the second hypothesis is: H2 GWC positive influences firms' environmental performance.

Practicing substantial environmental sustainability can lead to perform in a less impactful way on the environment but also acquire good reputation between different types of stakeholders and investors (Ervin et al., 2013) who care for the same values (Cable and Turban, 2003; Brammer and Pavellin, 2006; Yoo, 2021). The propensity of working for a company that follows the environmental sustainability principles and the support received by companies that adopt sustainable behaviors throughout the supply chain has been also confirmed by Merlin and Chen (2022) and by Marrucci, Daddi, and Iraldo, (2021), Daddi et. al (2019). An internal climate that is compatible with sustainability principles and a strong engagement and commitment of workforce to environmental sustainability leads to the perception of an external positive public esteem. Businesses' managers can make employers an active and proactive part in the external promotion of a sustainable behavior through the idea of the green employers external branding (Sulich, 2021). The success in the implementation of green strategies depends on the internalization of the green principles by the employees who, if adequately involved, can assume a proactive behavior in the external promotion of the firm. These considerations provide the base for our third hypothesis: H3 GWC positive influences firms reputation

Methodology. The data have been collected from a sample of European firms located in Bulgaria, Italy, Belgium, UK, Spain, Finland, coming from different strategic sectors (majorly manufacturing, construction, agri-food, wood and furniture, public administration). To achieve the maximum diffusion of the survey the selection of the respondents has been performed through a non-probability sampling methodology, convenience sampling (Galloway, 2005), useful since the population is extremely big and really complex to be defined and reached (Etikan et al., 2016). The responses have been collected between May and August 2024. The items used in the survey have been measured with a 5-point Likert scale, ranging from 5=strongly agree to 1= strongly disagree. Two items have been also used to measure firms' green performance (S., Hadi et. al. 2023), focusing on environmental performance that are related to material use and waste management and that for this reason can be adapted to different industries, while four items have been used to assess firms' green reputation with different types of stakeholders throughout the entire value chain (Marrucci, Daddi, and Iraldo, 2021; Daddi et. al 2019). The explanatory variable is the dichotomic variable Green Training (GT) that ranges between 1, if the organizations are already performing green training activities and 0 if they are not doing them. To assess the presence of possible differences of GT effect, countries and industries have been also adopted as control variable. GWC acts both as a dependent variable when the relation with GT is assessed and also as a mediating variable for the relation with GP and GR. This study adopts it as the mediating variable since the direct impact that green training has on it and its ability to vehicle the indirect effect on GT on firm environmental performance's and reputation. The analysis has been performed through the application of regression analysis, to measure the level and strength of the correlation between the application of green training programs inside the organizations and the results obtained in terms of green internal climate and then its moderating effect on performance and reputation. All the analysis as been performed using STATA software.

Results. The first hypothesis, that aim to verify if green training positive influence working climate, is verified. This result is particularly important since despite the numerous study that attribute a general positive influence of green training on employees' behavior, some studied have identified a possible negative impact due to the pressure created by the added overload created by the learning activity (Pinzone et al., 2019; Oppenauer and Van De Voorde, 2018; Topcic et al., 2015). The second and third hypothesis that aim to assess the mediating role of GWC - so if it can vehicle the positive effect of green training, associated majorly to personal behavior, to the organizational dimension through the impact on environmental and reputational performance - are both verified. The extremely high value of R2 demonstrate an important representativeness of the models and of the analysis used. From the tests performed it is noticeable that green training is not only a key variable from an institutional of view (CEDEFOP, 2023; Business Europe, 2022) but represents also an important leverage spendable in the field of long-life learning to promote a readaptation of the working profile to the needs of the green transition. The implementation of a well-structured training program that addresses skill gaps at the European level will equip employees with the necessary abilities, knowledge, and competencies (Fernando et al., 2019), fostering personal development (Xie et al., 2020) and encouraging proactive behavior (Gusmerotti et al., 2023). This approach not only aligns with environmental trends but also promotes a mindset of eco-innovation, leading to what can be termed a "new green empowerment", which serves as a foundation for enhancing firms' green performance and reputation. The present paper aims at confirming the efficacy of green training in promoting and environmentally friendly working climate and define how it can represent an antecedent for organizational performance, justifying the efforts made by firm to invest in it and help build resilience overtime. According to the previous inferences it is possible to state that green training has a positive impact on the green working climate inside the sample of European firms who took part to the survey. This means that a lifelong learning process as stated by European Union (Council of EU union, 2022), is significant to address the green transition issue and guarantee sectors resilience and adaptability to the new market needs. What seems to be even more important from the analysis conducted is the mediating role assumed by GWC respect to Green performance of the organizations and their green reputation. Both the relationships are statistically significant, showing a great reliability of the results and a strong correlation. Our results reveal that the role of a mediating variable like GWC is extremely important for multiple reasons. First, our work has evaluated the effect that green training has directly on the "personal" component of the organization, that is workforce and then used the internalization of the behavior acquired by the employees to test the effect on organizational variables like the effective

green performances of the firm and the perception that external stakeholders have of the overmentioned behavior. This confirms and extends what literature (Ren et al., 2018; Pinzone et al., 2016) has already claimed. The adoption of effective actions, like green training, suited to sustainability create a better internal working climate and avoid the risks of green washing effect and formal or superficial adoption of environmental friendly behavior (Boiral, 2007) and this is reflected substantially by a better environmental performances of the organization (as reflect by the relation between GWC and GP) but also by the image that it is given outside (as reflected by the relation between GWC and GR). The contraposition between the personal dimension of the effect of green training, also according to the AMO framework introduced in the initial section of the study, that directly affect the behavior of the learners makes necessary to introduce GWC has a mediating variable. Moreover, the present study gives the opportunity to observe the relations between the variables on a large scale comparing different European countries and different contexts. The adding of the control variables has indicated that GT produces positive effect on the organization internal climate despite the geographical or sectorial collocation of the organization which instead has a consistent weight when it come come to green performance and reputation.

Research limitations. This study has some limitations, though they do not diminish its relevance. First, the use of convenience sampling ensures a large sample, but results are not evenly distributed across countries. Second, while the link between green working climate (GWC) and green training is statistically significant, the low R2 value indicates limited predictability. This is expected, as green training mainly affects the ability component of the AMO framework, while other factors were not considered. GWC is shaped by multiple influences, including external pressures (Duan et al., 2020), firm-specific factors (Flagstad et al., 2022), and incentives (Arhavbarien et al., 2024). Nonetheless, the study confirms the significant positive impact of green training on the internal organizational climate, reinforcing its key role in the green labor market transition. The present research aims to raise the attention on the role of training and its impact on GWC as an important leverage of firm capacity to adapt to the challenges imposed by climatic pressure and policymakers' requests, maintaining and possibly gaining competitive advantage over time. Possible research paths could be related to the exploration of the role of green training focusing on further specific dimension and distinction (for example different training modalities) or perform longitudinal case study focusing on a specific country or a specific industry or even making comparison related to the moderating role of GWC between two specific countries other than European context.

Managerial implications. The paper highlights the power of green training in address the challenges of the green transition without leaving anyone behind, directly, influencing the firm's workforce and indirectly on firm's performance and reputation, helping building resilience overtime. Companies should constantly monitor and assess the level of preparation of their internal workforce and set a specific training program that impose to maintain the workers constantly updated according to market trends and policy requirements, building an internal culture that promotes resilience and consent to scale up and capitalize new knowledge, performing a smooth green transition aligned with sustainability principles.

Originality of the paper. The paper aims to explore the role of GHRM in supporting green transition by focusing on one of its components, green training and its role in aligning labor market demand and offer according to green transition need. Moreover, the paper analyses the role of GWC as a mediating variable for green performance and reputational and their overall impact on firm resilience inside a multisectoral business context.

Key words: Green Human Resource Management, Green Training, Green Skills, Green transition, Firm resilience

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