



Coaching Effectiveness in Performance Measurement and Management: An Exploratory Review in the Industry 4.0 Era

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ABSTRACT

In the Industry 4.0 era, the development of digital technologies and the digitalization of firms are rapidly evolving trends. While significant attention has been devoted to technological issues, scholars and practitioners are also emphasizing the essential role of managerial practices and employee engagement in enhancing performance. Under this trend, research on the effectiveness of coaching interventions in improving organizational performance has also increased. Our study reveals that coaching research has undergone a shift in focus from the perspective of the coach to the coachee and from individual performance to organizational effects. Moreover, the findings emphasize that coaching research is increasingly focusing on performance management practices to enhance employee engagement and performance.

CCS CONCEPTS

• General literature;; • Evaluation;; • Performance;;

KEYWORDS

Coaching, performance measurement, performance management, literature review

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1 INTRODUCTION

The Industry 4.0 (I4.0) era is challenging business. The use of technology that creates transformation in organizations has been named I4.0 [1]. The term I4.0 was first used at the Hannover Conference in 2011 [2]. In the last few years, the development of I4.0 moved from manufacturing and production systems [3] to agriculture [4], the food industry [5], and the construction industry [6]. While the I4.0 concept was initially related to innovation in the production process [3], it has been extended to managerial processes [7], [8]

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and other research areas. On the one hand, the I4.0 era is changing the way that companies approach digital technologies and digitalization. On the other hand, research is also increasingly targeted towards employee engagement and satisfaction, empowerment, leadership, and team effectiveness. All these aspects are essential to improve organizational performance [9], even if the effective adoption of technological innovations is obstructed by a lack of skills and suitable human resource management (HRM) practices [10].

The use of several technologies (e.g., the use of collaborative software for real-time communication, the adoption of technologies for integrating data-sharing, and the exploitation of big data analytics) has a huge impact on managerial practices and increases the sophistication of knowledge work. Innovation in performance measurement systems and performance management practices enables breakthrough innovations in organizations [11], [12]. As highlighted by Nudurupati et al. [11], I4.0 workers are stimulated by autonomy and mastery. In this environment, attempts at measuring and managing the performance of workers require the adoption of new approaches to avoid counterproductive results [13], [14].

In recent years, performance measurement and management (PMM) scholars have examined what and how to measure to improve organizational performance in light of the changing business environment. Smith and Bititci [15] emphasized the need for a balanced approach that allows organizations to improve diagnostic control systems and, at the same time, devote attention to fostering a democratic and participative management style. Even if digital technologies will assume an even more essential role in business [16], as the I4.0 trend indicates, social control, as defined by Tessier and Otley [17], is also essential for managing organizations.

Coaching is receiving increasing attention from companies as a tool for strengthening managerial practices and enhancing organizational and worker performance [18]. Coaching has been defined in several ways, including as a human resource tool [19] or as a process of training and development [20], [21] for people, teams, and organizations. However, scholars are still exploring how to demonstrate coaching effectiveness, as evidenced by the extensive fields of research that interact with the coaching effectiveness issue. Some fields focus on goal-setting [22] or development capacity, while others focus on leadership, mainly transformational leadership capacity, to engage employees [19], [23].

In our study, we review the literature on coaching effectiveness in the PMM field and we analyze the identified studies using the framework by Smith and Bititci [15]. This framework [15] was chosen for its basis on control theories and the well-known frameworks of Tessier and Otley [17] and Simon [24].

These authors analyzed the joint strength of technical and social controls, which they identified respectively as the performance

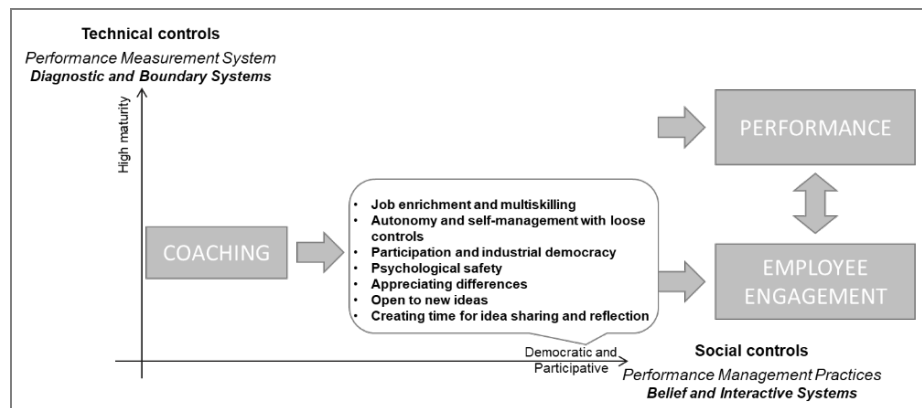


Figure 1: Framework adopted for investigation of the state-of-the-art coaching literature (adapted by Smith and Bititci [15]).

measurement and the management of performance, to increase companies' performance. Both Smith and Bititci [15] and Tessier and Otley [17] highlighted the need to adopt a balanced approach between the technical and social dimensions in studying PMM.

As illustrated in Figure 1, in this review we investigated the role of coaching in improving the practices of performance management in the PMM framework. In this way, we studied coaching as a key driver of performance management practices for enhancing employee engagement and performance in the I4.0 era. As Smith and Bititci [15] discussed, an incremental intervention in social control based on a democratic and participative management style (i.e., horizontal axis – Figure 1) not only improves the outcomes (i.e., employee engagement and performance) but also favors an incremental rise in the technical control based on the performance measurement system (see vertical axis - Figure 1).

The remainder of this paper is structured as follows. The next section presents the methodology of the exploratory literature review. Section 3 then describes and discusses the findings. Section 4 summarizes the main results identified in the review. Finally, Section 5 presents the limitations and future research avenues.

2 METHODOLOGY

According to the scope of the paper, we carried out a systematic literature review to explore the effectiveness of coaching on performance measurement and management. In addition, once we identified the final sample of papers, we performed a co-word analysis to map the evolution of coaching effectiveness.

In line with Tranfield et al. [25], we were able, after a preliminary review of the existing issues in the PMM and coaching literature, to formulate the research question below.

What is the role of coaching in favoring PMM practices in the Industry 4.0 era?

After the identification of the above research question, we selected an appropriate search string based on the following keywords:

- Coaching: We did not narrow the search to a specific type of coaching (e.g., managerial, executive, business, workplace) in order to include all types in the analysis;

- Performance management and measurement-related keywords.

We performed our search in the Scopus database (last access December 14, 2021) using the criteria described in Table 1. We initially limited the review timespan from 2011 until today because we are analyzing the I4.0 era, a period which was first identified in 2011 [2].

As reflected in Table 1, we identified the following inclusion and exclusion criteria:

- Exclusion criteria: as the focus of this research is coaching effectiveness in PMM within organizations, papers related to the sports and athletic field were excluded. In the same manner, studies related to life coaching in the psychology field were excluded, as they are not focused on organizational aspects. Applying these criteria, we excluded 36 papers and the final sample consisted of 139 papers.
- Inclusion criteria: in line with the above framework (see Figure 1) and the aim of our analysis, we targeted the selection process on papers focused on performance management, development, employee engagement, and performance measures. These criteria led us to select a final sample of 48 papers.

Before reading the papers in full, we analyzed the 48 studies through a co-word analysis based on the occurrences of keywords (both index and author keywords) in order to delineate the evolution of the coaching effectiveness concept [26].

In line with several previous studies in the literature review [27]–[29], we used software for bibliometric analysis named VOSviewer [30] to perform the quantitative phase of the analysis. This software is widely recognized as useful for analysis at an aggregate level in PMM [2], [12], [31], [32].

In the analysis, we considered all keywords with a minimum number of occurrences of two. The initial analysis identified 240 keywords, and 41 met this threshold. The size of the circles in Figure 2 indicates the number of occurrences of each keyword (the larger the circle, the more the keyword has been used in the selected papers), and the width of the lines indicates the strength of the link between two keywords (i.e., the number of papers in which two terms occur together). Finally, the total link strength described in

Table 1: the search criteria.

	Criteria	No. of results
Search string	TITL-ABS-KEY (coach*) AND (outcome* OR output*OR result* OR performance OR measure* OR effectiveness OR efficiency OR “organi*ational development” OR “performance measure*” OR “performance manage*”)	1682
Source Type	Journal	1494
Subject Area	Business, Management and Accounting	220
Language	English	217
Timespan	2011-2021	175
Exclusion criteria	Sport and psychology	139
Inclusion criteria	Performance Management, Development, Leadership, employee engagement, empowerment goal setting, performance evaluation and feedback, performance measures, balanced scorecard	48
Final sample		36

Table 2: the results of the co-word analysis of keywords.

Labels	Occurrences	Links	Total link strength
coaching	27	31	78
organizational development	9	12	25
performance management	8	17	23
leadership	7	18	24
executive coaching	6	11	13
leadership development	6	9	16
motivation	6	11	18
management development	5	7	9
performance	5	14	20

Table 2 specifies the total strength of the co-occurrence links of a given keyword with the others [30].

According to Zupic and Čater [26], the co-occurrence analysis of keywords is useful to connect themes and their relationships in a map. This method allows researchers to build the structure of the investigated topic by highlighting the evolutionary trend of the topic and the topics associated with a specific research stream.

After the quantitative analysis, we conducted the qualitative analysis by reading the papers in full. We ultimately excluded 12 papers (three were not available and nine were not related to our objective). The subsequent section describes the main findings of the review.

3 FINDINGS AND DISCUSSION

The quantitative bibliometric analysis of the 48 selected publications performed by VOSviewer reveals the most used keywords in studying coaching, i.e., organizational development, performance management and leadership (see Table 2).

Figure 2 shows the overlay visualization of keywords through the timespan 2011-2021. It is noteworthy that keywords, such as commitment, creativity, ocb (i.e., organizational citizen behavior), employee, and transformational leadership are more recently used than coaching relationships, learning design, development, etc. The different use of keywords across years allows us to delineate the evolution of the investigated concept.

As illustrated in Figure 2, there is significant research interest in employees, commitment [33], [34], and engagement [35], [36] together with other organizational issues such as workplace coaching, manager-as-a-coach, and the role of transformational leadership in affecting employee performance.

However, as underlined by Zupic and Čater [26], co-word analysis has some limitations, such as different meanings assigned to the same keyword in two separate papers. For example, the keyword “coaching” is used by studies concerned with the coaching process [37], [38], but also in research focused on the role of the manager as a coach [34], [35].

To understand the trend of coaching effectiveness in PMM, we performed a qualitative data analysis of the selected papers, which revealed the following main trends.

The concept of coaching matured from 2011 to 2021. While early studies investigated the development of the coaching process and the effectiveness of the coach [39], research today is more focused on coachee engagement in organizations [34], [35].

The understanding of coaching interventions also matured during the last 10 years. Today, there are several coaching definitions to reflect how the role of the coach evolves within organizations. We identified, for example, managerial coaching, executive coaching, business coaching, and workplace coaching, which assume many facets according to the authors’ assumptions. The several definitions related to coaching concepts present advantages and disadvantages. The differentiation of coaching labels confirms the increasing and

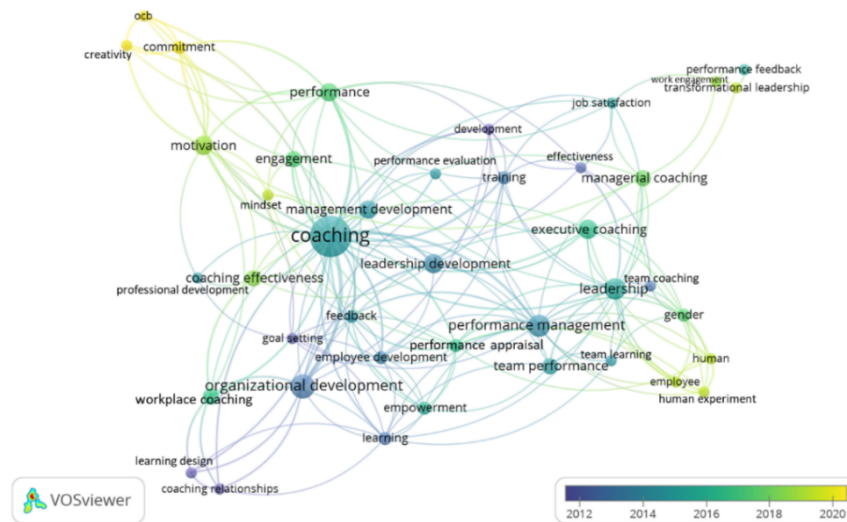


Figure 2: Co-word analysis of the 48-result sample using VOSviewer software.

maturing research in the field; however, it also creates a lack of coherence in the use of coaching labels.

The I4.0 era has not directly influenced the research on coaching effectiveness in PMM. Despite the increasing use of technology and the digitalization of companies, there was only one study in the review that focused on technology [40]. Soliman [40] evaluated how coaching affects technology transfer for employees and found that coached employees accomplished a high technology transfer effectiveness. The paucity of studies focused on the I4.0 era highlights the need for further research related to employee and human development in organizations. As stated by Trotta and Garengo [10] [p. 70], “I4.0 is therefore acknowledged to have disruptive potential, especially for its consequences on the employees. In this context, the management of employees is a key enabler to fully benefit from I4.0.”

There is a relationship between the PMM practices identified by Smith and Bititci [15] and the effectiveness of coaching. A democratic and participative control system in managing performance achieves positive outcomes in terms of performance and employee engagement. While there are no standardized performance management practices in the PMM research, a number of studies [15], [41], [42] have linked performance management practices to certain human resources practices (see for example [42]). Smith and Bititci [15] recently proposed the framework shown in Figure 1 and tested practices that they identified with case studies. The selected papers on coaching effectiveness demonstrate that several outcomes of coaching projects are related to PMM practices identified by Smith and Bititci [15], even if they do not explicitly refer to PMM literature. For example, Zuñiga-Collazos et al. [18] highlighted the role of coaching in enhancing leadership roles for goal setting, which aligns with the “self-management and autonomy” practice in Figure 1. Concerning the “psychological safety” practices in Figure 1, Ali et al. [19] demonstrated that coaching enhances work engagement and reduces turnover intentions. Concerning the “development

of multiskilling employees,” both team-leader coaching [43] and internal coaches [35] have a positive effect on their development.

The main trends in research on the effectiveness of coaching in PMM indicate that the coaching process has a positive impact on PMM practices, enhancing organizational performance in the I4.0 era.

4 CONCLUSION

This paper presents a systematic literature review with an exploratory nature for the purpose of understanding coaching effectiveness in PMM during the I4.0 era. To examine the topic and identify the trends in research in this field, we performed both a qualitative review and a bibliometric review.

The main findings of our research reveal that the concept of coaching is evolving. Research on coaching has increased in the last 10 years; therefore, the understanding of coaching and the development of coaching interventions has progressed. At the same time, in line with the definition of I4.0 provided by Trotta and Garengo [10], the role of coaching remains focused on employee issues, engagement, and attitudes even in a changing environment with a focus on digital technologies. This trend sheds light on the key role of people and performance management practices across the years. Indeed, in line with the aim of our review, the selected sample of papers indicates that coaching outcomes are consistent with the PMM practices identified by Smith and Bititci [15].

5 LIMITATIONS AND FUTURE RESEARCH AVENUES

This research has several limitations. Firstly, only a limited time span (2011–2021) was selected. Even if this timeframe is consistent with the beginning of the I4.0 era, the number of papers was limited. Thus, future research should not limit the search so extensively in

order to investigate the trend of coaching effectiveness in PMM before and during the I4.0 research.

Secondly, we included papers that investigated the role of coaching on factors such as performance management, development, and leadership. However, future research should analyze the role of coaching directly on performance. This approach could be useful for understanding if coaching plays a moderating role between PMM and performance or if it directly affects performance.

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