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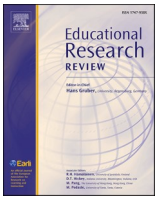

Review

Teaching for paradigm shifts: Supporting the drivers of radical creativity in management education

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ABSTRACT

In a rapidly evolving technological and societal environment, businesses and business education face paradigm shifts, characterized by significant transformations in shared mindsets, assumptions, and practices. This study emphasizes the necessity for leaders to know what capabilities and traits are needed for paradigm-breaking creative thinking—and for management educators how to teach those skills. We report the results of our integrative literature review, which investigated how management education addresses creativity, especially paradigm-breaking radical creativity. The results show that radical creativity is scarcely identified as a distinct type of creativity among business educators—instead, paradigm-preserving incremental creativity is discussed more. Our findings shed light on both the accomplishments and potential areas of improvement in teaching practices, curriculum design, and management education research regarding radical creativity. The goal is to guide educational leaders toward fostering a deeper integration of radical creativity within management education as well as to identify the boundaries of radicality, ensuring that the future management domain is equipped to creatively instigate and inhibit paradigm shifts when appropriate.

1. Introduction

In today's rapidly changing competitive environment, technological landscape, disrupting geopolitical scenarios, and urgent sustainability objectives, businesses in all industries—and therefore business educators—face paradigm shifts, which Kuhn (1962) defined as fundamental transformations in shared assumptions, concepts, and practices guiding thoughts and actions. As we grapple with such shifts, traditional approaches and solutions often prove inadequate. Thus, it is imperative that future leaders embrace a mindset that is open to creative thinking and the capacity to consider even nonobvious alternatives (Daly, 2016; Picciuto & Carruthers, 2014). Harnessing and initiating paradigm shifts empower organizations to transcend constraints, rethink strategies, and adopt innovative solutions tailored to emerging needs (Proctor, 2020; Silk et al., 2019). Knowledge and skills related to paradigm shifts also enable companies and educators to be aware when it is not time to engage in paradigm modification (Proctor, 2020).

Creativity is most commonly understood as the capacity to produce novel and useful ideas (Amabile, 2018). Scientific disciplines differ in how creativity can be achieved, recognized, or appreciated (Gaut, 2010). Although convincing arguments have been made on

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the possibility of educating creatively and for creativity (Gaut, 2014), past research has noted that explicit instructions on creative processes are clearly more evident in softer sciences, such as the arts and humanities (Daly et al., 2016), than in management. Amid this setting, business schools and management educators have, for decades, pushed to change and redesign their curricula and pedagogical strategies (Baker & Baker, 2012; Frolova et al., 2021; Gallos, 2009; Marques et al., 2013).

However, from the perspective of creativity, paradigm shifts call for a particular kind of creative process and ideas not yet widely identified in management education research. The field of organizational psychology has defined the concept of *radical creativity* (in contrast to incremental creativity) (Gilson & Madjar, 2011; Madjar et al., 2011). The term "radical" here is rooted in its original meaning derived from the Latin word "radicalis," which is related to "radix" (meaning "root") (Merriam Webster, n.d.). Hence, the term signifies a return to the essence or origin of a phenomenon to fundamentally understand or instigate profound change. Thus, radical creativity strives for groundbreaking ideas, challenging norms, and fostering new paradigms (Madjar et al., 2011). This contrasts with incremental creativity, which refines existing approaches within established frameworks (Gilson & Madjar, 2011) and finds "new applications for existing methods, processes, or products, and adapting what is currently done" (p. 171).

Whereas radical creativity was conceived in the 2010s, research on the *paradigm-relatedness* of creativity has decades of history. Most importantly, the fields of information systems (IS) and human–computer interaction (HCI) have long identified and differentiated between paradigm-breaking (or paradigm-modifying) and paradigm-preserving creativity (McFadzean, 1999; Nagasundaram & Bostrom, 1994; Stenberg, 1999). Research has shown that the former challenges dominant paradigms by addressing the boundaries and norms of a problem (Gryskiewicz, 1980), reconfiguring its components (Nagasundaram & Bostrom, 1994), or refocusing the abstraction level used in the analysis (Dean et al., 2006), thus propelling contributions toward transformative directions (Sternberg, 1999, 2005). Additionally, research has shown that the creativity style associated with paradigm-relatedness can be understood as independent from the creativity level (Silk et al., 2019) and as a subcomponent of creative novelty (Dean et al., 2006). Numerous empirical findings have been reported regarding the paradigm-relatedness of creativity from outcome categorization, operationalization, and measurement perspectives (Silk et al., 2019). Furthermore, ideation methodologies have been outlined based on the desired level of paradigm engagement (McFadzean, 1998a, 1998b, 1999; Proctor, 2020).

What IS and HCI studies in the paradigm-relatedness of creativity have lacked and what radical creativity research in organizational psychology as well as creativity-related discourse in the field of radical innovation have been able to contribute is the knowledge on precursors of paradigm-breaking creativity (Gilson & Madjar, 2011; Kaufmann & Beghetto, 2009; Unsworth & Luksyte, 2015). Newer studies have discerned the distinct drivers that influence radical creativity in different organizational strata. Here, the focus has been within individual factors (e.g., motivation and cognitive processes; Gilson & Madjar, 2011; Jaussi & Randel, 2014; Ziebro & Northcraft, 2009), team aspects (e.g., diversity, emotional competences, and network brokering; Doehne & Rost, 2021; Sung et al., 2020; Venkataramani et al., 2014), and organizational antecedents (e.g., transformative organizing and wide-scale collaboration; Balau et al., 2020; Dunne & Dougherty, 2012). Leadership-related drivers of radical creativity have also been specifically investigated at all these levels (A. Zhang et al., 2021; Beugelsdijk, 2008; Gong et al., 2017; Rampa & Agogué, 2021; Venkataramani et al., 2014; Xu & Wang, 2019).

Although the paradigm-relatedness of creativity and, later, radical creativity have indeed a long combined theoretical legacy, we find that such conceptual development has not yet reached educational research in the field of management education. Thus, our work addresses a significant gap in the management education literature—the oversight of the differences between paradigm-preserving incremental creativity and paradigm-breaking radical creativity. Despite the acknowledged importance of fostering creativity in education (Bertels, 2018; Glassman & Opengart, 2016; Liu, 2006; Roffe, 1999; Sunley et al., 2019), business schools' efforts to modify their curricula and teaching practices have seldom been scrutinized for alignment with specific paradigm-relatedness goals (Parker, 2018). We argue that this lack of knowledge restricts the full exploitation of creativity in management education, especially when paradigm shifts are essential. Therefore, there is a need to systematically and critically assess the extant views regarding how to teach creativity in management education, especially from the perspective of more radical paradigm-breaking forms of creativity. Thus, the objective of the present study can be summarized by the following research question: *How does and how should management education address paradigm-breaking radical creativity?*

To answer the research question, we conducted an integrative literature review. We identified how creativity has been approached in management education and what might be lacking in existing educational understandings from the perspective of paradigm-breaking radical creativity. The results of our integrative review demonstrate the areas of success and improvement both from the perspective of the educators and the university while also highlighting the teaching practices and capabilities to be taught. Additionally, we addressed the potential boundaries of radical creativity in management education domains. The remainder of the article is structured as follows. First, drawing from the literature on radical creativity and the paradigm-relatedness of creativity, as well as the creativity-related radical innovation literature, we describe the characteristics driving radical creativity. The method section describes how the creativity-related management education literature review, analysis, and synthesis were conducted. We then proceed to describe the findings of the review. We critically examine the extent to which management education can address paradigm-breaking radical creativity and elaborate on the various issues that educators must consider if such creativity is emphasized. We conclude the article by analyzing the fit of radical creativity within business school domains, problematizing the role of radical creativity in management education, and proposing development areas for educational leaders willing to foster a greater integration of management education and radical creativity research and practice.

2. Key drivers of radical creativity

Conceptual work for paradigm-breaking creativity was initiated in the IS and HCI domains (e.g., Nagasundaram & Bostrom, 1994),

but the precursors of radical creativity have been analyzed mainly in the fields of organizational psychology and radical innovation (e.g., Dunne & Dougherty, 2012; Gilson & Madjar, 2011). Drawing on this interdisciplinary heritage, we next present the key drivers for radical creativity, in contrast to paradigm-preserving incremental creativity. Since creative work is a multilevel phenomenon (Mumford et al., 2015), we analyze the drivers at the level of individuals, teams, and organizations, and we also focus on leadership for radical creativity at all levels. The drivers are summarized in Fig. 1.

2.1. Individual-level drivers

2.1.1. Persistence through strong intrinsic motivation balanced with flexibility

The broader creativity literature has emphasized the major importance of intrinsic motivation but has found that extrinsic motivation can also be conducive to creativity in certain conditions (Amabile & Pratt, 2016; Kaufmann & Beghetto, 2009; Unsworth, 2001). The creativity literature provides a rich and nuanced discussion of motivation, highlighting the interplay between different motivation types and their sources (Hennessey, 2010; Kaufmann & Beghetto, 2009; Unsworth, 2001). Due to its short history, radical creativity research has not yet reached the same level of clarity and depth in its motivational analysis. Research on radical creativity has, however, thus far highlighted the explicit connection between intrinsic motivation and radical creativity and indicated that extrinsic motivation is more related to incremental creativity (Gilson & Madjar, 2011; Malik et al., 2019). Moreover, the literature shows that radical creativity requires further increased persistence, which is available primarily through internal motivation (Gilson & Madjar, 2011). Radical creativity literature has also reported that increased persistence needs to be compensated with similarly increased cognitive flexibility (Yu & Choi, 2021).

2.1.2. Avoidance of overly ambitious creativity goals

In the broader creativity literature, an individual's learning goal orientation has been shown to have a positive mediating effect on the connection between internal motivation and creativity. High learning goals encourage one to expand one's knowledge base, experiment, and take risks (Malik et al., 2019). However, taking a radical creativity lens problematizes this relationship—high personal learning goals do not always produce radical ideas (Mack & Landau, 2020). To accompany this, the literature shows that, in contrast to incremental creativity, overly ambitious creativity goals should be avoided when striving for radical creativity. While motivation and incremental creativity are positively connected via creative goal orientation, the relationship between such orientation and radical creativity is an inverted U-shape (Gong et al., 2017). This is because very strong personal creativity goals can lead to too much time being spent monitoring, comparing, and assessing one's actions, thus hampering radical creativity.

2.1.3. Knowledge synthesis across many domains

In the broader creativity discourse, the potential to come up with creative ideas is dependent on information acquisition and analysis skills—with the radical creativity perspective in particular emphasizing knowledge integration and synthesis across domains (Mahmoud-Jouni & Charue-Duboc, 2008; Tang & Ye, 2015; Ziebro & Northcraft, 2009). Here, interdisciplinarity is essential (Mahmoud-Jouni & Charue-Duboc, 2008), as only medium-level domain-specific knowledge has a positive relationship with radical ideas (Griffin et al., 2009; Mack & Landau, 2020). Research on exceptional radical innovators has shown that broad interdisciplinary

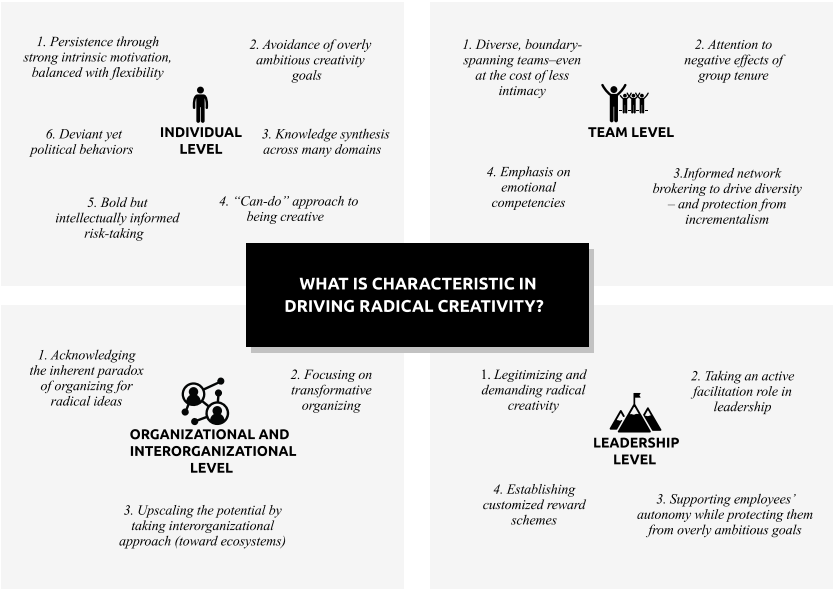

Fig. 1. Drivers of radical creativity at different levels.

knowledge from different domains, supplemented with a multidimensional perspective on value (to the point of perhaps being idealistic), seems to drive radical and innovative ideas (Griffin et al., 2009). Moreover, to leverage interdisciplinarity, radical creativity requires high intellectual capital, as this enables critical thinking and allows for the recognition and disassembly of the status quo and other sources of fixation (Bu et al., 2021). However, a high level of creativity process knowledge may not be needed for radical creativity, as shown in the results of Mack and Landau (2020); this might be due to the increased detrimental effect of possessing "too many algorithms" for creativity, as outlined by Amabile (2018).

2.1.4. "Can-do" approach to being creative

Knowledge integration and synthesis with radical creativity is also particularly driven by creative self-efficacy (CSE), defined as "the degree of confidence one has in one's ability to be creative" (Jaussi & Randel, 2014, p. 401). CSE is relevant in all creative work, but according to the literature, CSE has a strong role in radical creativity—significantly stronger than in incremental creativity (Jaussi & Randel, 2014). CSE's effect on radical creativity is particularly mediated by external scanning capabilities (Jaussi & Randel, 2014). In practice, this means that "individuals who have a high level of creative self-efficacy can increase the likelihood that they will achieve radical creativity by scanning for information outside of their organization's boundaries" (Jaussi & Randel, 2014, p. 400).

2.1.5. Bold but intellectually informed risk-taking

All creativity includes risks, but radical creativity is particularly characterized by significant risks related to the goals of the creative task, as well as interpersonal processes (Madjar et al., 2011; Sung et al., 2020; Y. Zhang et al., 2021). Therefore, in the existence of proper (intrinsic) motivational factors, a specifically relevant mediator of radical creativity is an individual's willingness to take risks (Y. Zhang et al., 2021). Furthermore, individuals with high intellectual capital can efficiently manage creativity-related risks (Bu et al., 2021). Again, while this identified need for risk-taking is well aligned with the broader creativity literature, radical creativity requires *more* intellectual capital to enable the management of uncertainties, act with immediacy in creative actions, and balance the cognitive flexibility-persistence balance (Y. Zhang et al., 2021).

2.1.6. Deviant yet political behaviors

Finally, although creativity is often linked to unconventional thinking and challenging the prevailing status quo, radical creativity literature has specifically reported on the concept of creative deviance (Z. Liu et al., 2021). By engaging in creativity-related deviant behaviors, individuals can explore ideas beyond the short-term scope of an organization and seek solutions in unconventional ways (Z. Liu et al., 2021). Interestingly, creative deviance is driven by an individual's status orientation; the creatively deviant individual is specifically motivated by the rebellious status gained from peers (Z.Liu et al., 2021). However, deviant behavior should not just be "rocking the boat," as political skills seem to be important in navigating communities and organizations (to gain acceptance and resources) when pursuing radically creative output (Griffin et al., 2009).

2.2. Team-level drivers

2.2.1. Diverse, boundary-spanning Teams—Even at the cost of less intimacy

Following the reasoning of Doehne and Rost (2021), creating radical ideas, and thus fostering radical creativity, seems to be particularly reliant on collaboration that utilizes teams' diverse knowledge and processing structures regarding members, information, and connections. This requirement is well in line with the information/decision-making perspective of the broader creativity literature, indicating that heterogeneous, boundary-spanning, and cross-functional teams perform better in creative tasks due to extended cognitive resources, a wide breadth of perspectives, greater information use, and groupthink avoidance (Beugelsdijk, 2008; Doehne & Rost, 2021; Rampa & Agogué, 2021; van Knippenberg & Schippers, 2007). However, the drivers of radical creativity seem to contrast the similarity-attraction perspective of creativity literature, which states that teams with similar functional, educational, and industry backgrounds are able to share and process more information and foster a familiar emotionally intimate culture, thereby producing more creativity (Doehne & Rost, 2021; van Knippenberg & Schippers, 2007). Thus, the literature suggests that while emotionally intimate structures produce incremental creativity (Lynch & West, 2017; Ziebro & Northcraft, 2009), more diverse compositions, greater information sharing with dissimilar others, and increased diversity of knowledge shared should be prioritized over intimacy when going toward radical creativity (Tang et al., 2017; Ziebro & Northcraft, 2009).

2.2.2. Attention to the negative effects of group tenure

In terms of diversity requirements, one must also pay attention to the team life cycle and group tenure. If the team is left to evolve naturally, an initially favorably composed team might end up detrimentally structured for radical creativity. Over time, the team may create their own, deeply similar interaction patterns (Ziebro & Northcraft, 2009). Furthermore, an initially diverse group may start to conform and align its thinking, and members' unique ideas might be discouraged; these patterns hinder radical creativity (Tang & Naumann, 2016). Thus, the need for diversity in team composition, processes, and structures is pronounced not only when the team is formed but also over its lifetime when striving for radical creativity. Moreover, individuals' expertise identities play an important role here—a strong expertise identity drives radical creativity and seems to balance the effects of team conformity (Tang & Naumann, 2016).

2.2.3. Informed network brokering to drive diversity—and protection from incrementalism

Although diverse employee ties are important for radical creativity, their effect is limited in large organizations because employees

do not necessarily have adequate access to information on how their creative efforts relate to other parts of the organization and the organization as a whole (Venkataramani et al., 2014). Such a situation can be addressed by intentionally shaping team connections—close proximity between dissimilar people facilitates diverse information sharing from different networks, breaking homophilous interactions and information-sharing patterns, and counteracting the tendency to work with familiar members (Ziebro & Northcraft, 2009). Team leaders and others in liaison positions are crucial here, sharing different perspectives and ideas and shaping structures (McAdam & Leonard, 2004; Venkataramani et al., 2014). Along with leaders, employees must actively engage in these networking actions and extend their networks outside their own boundaries (Venkataramani et al., 2014). Furthermore, it seems that such networking should primarily be dedicated to knowledge integration and not to using one another's creative skills—because radical creativity is driven more by information diversity than the creative skills of close colleagues (Madjar et al., 2011).

2.2.4. Emphasis on emotional competencies

Finally, due to the far stronger diversity and lesser intimacy than in incremental creativity, teams aiming for radical creativity are particularly prone to dissonance and conflict (Mahmoud-Jouni & Charue-Duboc, 2008). The literature has highlighted the idea that tensions should be mitigated by developing team members' emotional competences. This helps individuals manage socially challenging situations inherent in radical creativity aims (Sung et al., 2020).

2.3. Drivers at the organizational and interorganizational levels

2.3.1. Acknowledging the tension of organizing for radical ideas

Building on existing discussions of organizational creativity (Woodman et al., 1993), the radical creativity literature recognizes the concept of "radical organizational creativity," which can be defined as an "organization's ability to generate ideas that differ substantially from an organization's existing practices" (Balau et al., 2020, p. 536). In the extant literature, organizational creativity is defined as "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" (Woodman et al., 1993, p. 293). To this end, radical creativity builds tension, as its aims may contradict the existing ways of organizing the business, from creative processes to rethinking the organization's mission and intentions, as well as with whom the organization should cooperate and compete.

2.3.2. Focusing on adaptive and transformative organizing

Regarding organizing, when seeking radical creativity and addressing the above-mentioned tension, the key is to avoid mechanistic (or bureaucratic) organizing and to break rigid routines (Balau et al., 2020; Rampa & Agogué, 2021). This is a challenging task, as established organizations in particular have anchored their processes, routines, and resource allocations to their existing products, customers, and networks. Here, particularly apt for studying the requirements and scope of radical creativity are the concepts of adaptive and transformative approaches to organizing, as described in the organizational creativity literature (Dunne & Dougherty, 2012). In this context, adaptive organizing is about maintaining the fast and continuous change required for creativity (Rampa & Agogué, 2021). Here, organizations use so-called semi-structures (e.g., platforms), defined as structures "in which some features are prescribed or determined (e.g., responsibilities, project priorities, time intervals between projects), but other aspects are not" (Brown & Eisenhardt, 1997, p. 28). However, while the key to such adaptive organizing is to maintain a steady stream of innovation, ultimately, creative output is prone to incrementalism through gradual adaptation to a constantly changing environment (Dunne & Dougherty, 2012). The transformative approach to organizing goes further, requiring greater flexibility and perceiving the organization as a complex adaptive system (Dunne & Dougherty, 2012). Organizing takes a more mission-driven stance here—the key is to drive (radical) change with a clear direction (and agency) instead of adapting.

2.3.3. Upscaling the potential by taking an interorganizational approach (toward ecosystems)

A prevailing theme of the radical creativity literature is that while organizational creativity has traditionally been viewed as an *intra*organizational concept, the target of analysis in radical creativity is turning toward *inter*organizational settings (Balau et al., 2020). As discussed earlier, radical creativity requires exploring and synthesizing ideas across different domains (Bu et al., 2021). Inspiration that comes from outside the organization is less likely to be connected to the original problem and therefore sparks increased novelty (Jaussi & Randel, 2014). This "distant search" (Balau et al., 2020, p. 537) for knowledge outside one's own purview is often performed with clients and partners by engaging in co-creation, but with radical creativity, the work should span more extensive networks, as direct stakeholders' modus operandi might favor risk-averse incremental solutions (McAdam & Leonard, 2004).

To increase the scope of distant search and mitigate the problems of direct stakeholder incrementalism, the interorganizational perspective on radical creativity has recently moved beyond customer–supplier and partner dyads toward business ecosystems. Adner (2017) showed how successful companies collectively organize around focal value propositions shared by all ecosystem members. The ecosystem approach naturally builds on transformative organizing (Dunne & Dougherty, 2012), increasing the scale of organizational creativity and enabling radical creativity through increased possibilities for new connections between disciplines and industries.

2.4. Leadership-related drivers

2.4.1. Legitimizing and demanding radical creativity

The creativity expectations of leaders are positively related to radical creativity among employees (Xu & Wang, 2019). Radical creativity requires legitimacy, support, and clear demand from leaders (Lempiälä, 2010; Rampa & Agogué, 2021). Such expectations

stimulate and encourage employees in their radical creativity-related efforts (Xu & Wang, 2019) and help the employees avoid excessive caution that prevents radical efforts (McAdam & Leonard, 2004). Here, the radical creativity vision should be communicated clearly and in a format that allows flexibility in interpretation (Lempiälä, 2010).

2.4.2. Taking an active facilitation role in leadership

To support radical creativity, the leader must clearly convey radical creativity in their leadership style (Xu & Wang, 2019), although it might be somewhat unconventional, especially in traditional organizations (Z. Liu et al., 2021). Creativity at large needs supportive leadership (Beugelsdijk, 2008), and with radical creativity, leaders must perform as active members of a creative network. Leaders serve more as facilitators who enable creativity than create strict procedures and rules for how work must be completed.

Leaders have a significant role in promoting the use of multisource information, an important prerequisite for radical creativity (A. Zhang et al., 2021). By occupying and benefiting from critical liaison positions in organizations, leaders can assist employees' radical creative actions by connecting efforts within the organization (Venkataramani et al., 2014). Furthermore, a strong level of leader–member exchange promotes the sharing of high-quality information among diverse stakeholders (A. Zhang et al., 2021). Moreover, room must be provided for creativity—providing adequate resource usage for problem iteration, allowing and even encouraging failure (Lynch & West, 2017), and embracing the culture of exploratory risk-taking, questioning, and tolerance (Lempiälä, 2010; McLaughlin et al., 2008). Here, the leader should practically redefine what success and failure mean and facilitate employees' willingness to learn from both of them (A. Zhang et al., 2021).

2.4.3. Supporting employees' autonomy while protecting them from overly ambitious goals

Leaders also play a particularly significant role in radical creativity by providing autonomy support for employees (Y. Zhang et al., 2021). Generally, empowerment is one of the main enablers of creativity (Mazzei et al., 2016). To this end, autonomy supports radically creative work by providing employees with the opportunity to recognize their own intrinsic motivational factors and to align such internal interests with the creative tasks at hand (Y. Zhang et al., 2021). Here, it is important that leaders recognize the preferred type of creativity being pursued (Madjar et al., 2011; Y. Zhang et al., 2021). Leaders should be active in managing the personal goals of employees and teams due to the nontrivial relationship between creative goal orientation and radical creativity. Employees should be guided away from overly ambitious goals (Gong et al., 2017). Additionally, the team's regulatory strategies should be directed toward an effective explorative–exploitative balance (Li et al., 2019).

2.4.4. Establishing customized reward schemes

Lastly, creativity can and should be incentivized, but the specific motivational characteristics of different types of creativity must be considered (Barba-Aragón & Jiménez-Jiménez, 2020). As discussed earlier, extrinsic rewards may not be conducive to the

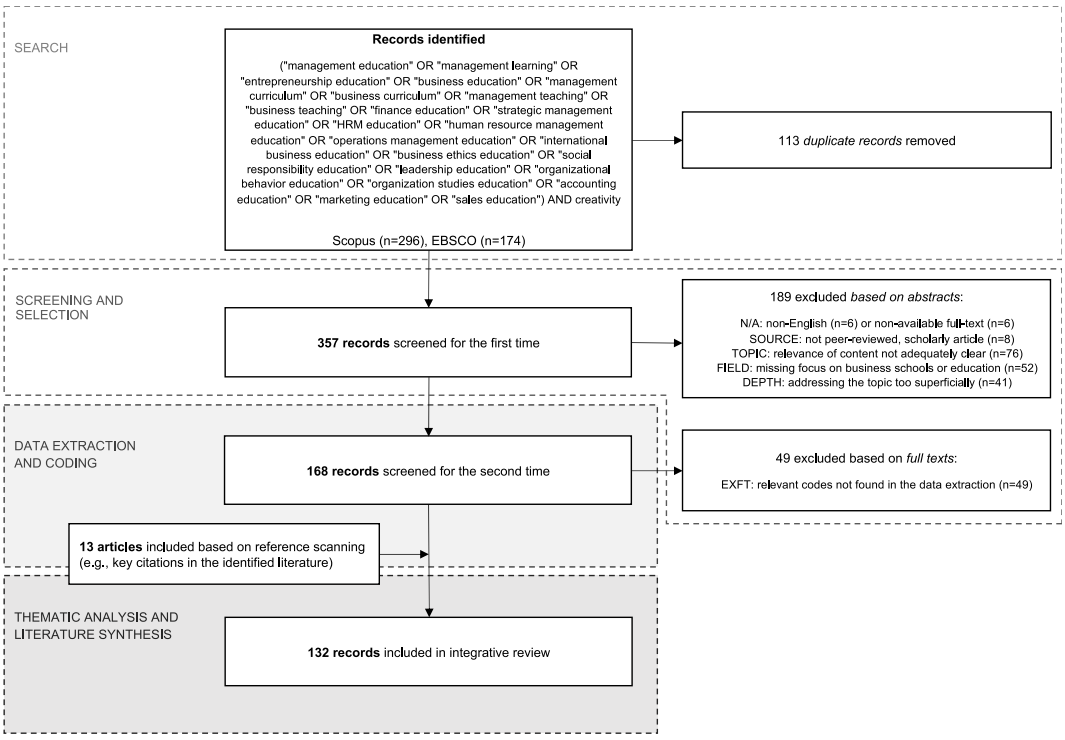

Fig. 2. Flow diagram and process outline for study selection.

involvement, commitment, and persistence required for radical creativity. Thus, to drive radical creativity, leaders must primarily tap into the intrinsic motivation of their employees (Malik et al., 2019), and the plurality and flexibility of different reward schemes should be acknowledged (Laursen & Foss, 2003). In teams, collective promotional methods are also viable but could be nonfunctioning if the leadership structures are centralized and the work contexts are formalized (Beugelsdijk, 2008; Li et al., 2019).

3. Methods

We conducted an integrative literature review of creativity in management education to analyze its fit with the identified drivers of paradigm-breaking radical creativity. We selected an integrative approach to review, critique, and synthesize the representative literature (Torraco, 2005). The purpose of an integrative review is to critically appraise how well the literature has presented the main ideas, issues, and underlying relationships of a certain domain (Snyder, 2019; Torraco, 2005). The resulting synthesis of the integrative review provides insights into and suggestions about how the stream of literature can be elevated to the next level (Rockmann et al., 2021). Thus, our aim is to provide a new perspective on creativity in management education. We form a unique conception informed by the comprehensive synthesis of the literature and intimate knowledge obtained through the review, with the aim of providing fruitful, even provocative, ideas and new directions for educational practice and research (Torraco, 2005).

Following the methodological frameworks set for reviewing the higher education literature (Bearman et al., 2012; Chong et al., 2022), we utilized a structured and predefined process to ensure a reliable and meaningful critical appraisal of the studies. This process was conducted as a staged review, in which all the articles were initially evaluated based on the abstracts and then based on the eligibility criteria before the full texts of the included articles were analyzed in depth (Torraco, 2005). The data coding and analysis followed the principles of thematic analysis (Braun & Clarke, 2006) and focused on a qualitative interpretation of the sample (Snyder, 2019). The process flow is illustrated in Fig. 2 and described in detail in the following paragraphs.

3.1. Search strategy

To address our research question, we first defined the search query, searching academic journal article titles, abstracts, or keywords for the word "creativity" and one of the following terms: "management education," "management learning," "business education," "management curriculum," "business curriculum," "management teaching," "business teaching," "finance education," "strategic management education," "entrepreneurship education," "HRM education," "human resource management education," "operations management education," "international business education," "business ethics education," "social responsibility education," "leadership education," "organizational behavior education," "organization studies education," "accounting education," "marketing education," or "sales education."

The query was chosen to ensure the depth and breadth of coverage in management-related education while maintaining a focus on the core issue of creativity. The search produced 296 results from Scopus (searched in June 2022) and 174 from EBSCOHost (searched in June 2022). After removing duplicate results, we obtained 357 original records.

3.2. Screening and selection

The first screening reviewed and excluded (n = 189) the records based on the abstracts. Five criteria were defined for exclusion and inclusion. First, we excluded records that were considered *unavailable*—not written in English (n = 6) or not having the full text accessible (n = 6). Second, we required that the *source* be applicable; only peer-reviewed scholarly articles were included (e.g., books, editorials, introductions to journal issues, and records from conference proceedings were excluded; n = 8). Third, we required that the *topic* of the record clearly match the defined scope of creativity-related management education (interpreted broadly, as visible in our keyword sets). Records that did not demonstrate a clear focus on such areas were excluded from further review (n = 76). For the last two stages of the first screening, we also referred to full-text articles to support our inclusion or exclusion decision. Therefore, based on the *field* of study, we excluded articles that did not focus on education in business schools (n = 52). Finally, we excluded records that did not address the set topics with the appropriate *depth*, such as having only a superficial connection with nurturing creativity (n = 41). For example, a study on the attraction of "sales education" among potential business major students was excluded because "appreciation for creativity" was mentioned only as a factor that the students searched for in the higher education teaching faculty. The first screening left us with 168 records for thorough full-text analysis, data extraction, and coding. The articles excluded in the first screening are listed in Appendix A.

The second round of screening was conducted in parallel with reading the full-text articles and extracting the data. Roughly one in three articles was excluded from the following literature synthesis based on the full texts. Papers were excluded in this phase if they did not yield relevant codes for further analysis (n = 49). Finally, we identified and included a few additional records (n = 13) during the data extraction and coding, such as key citations in the identified literature that were not included in the literature searches. After the second round of screening, the 132 identified records formed the basis for our literature synthesis on creativity in management education. Appendix B presents the articles excluded from the second screening, and Appendix C presents all the included articles.

3.3. Details of the data extraction, coding, thematic analysis, and synthesis

The thematic data analysis focused on finding repeated patterns of meaning across the dataset (Braun & Clarke, 2006) while critically analyzing the topic and deconstructing it into its basic elements for the integrative review (Torraco, 2005). Following the

	The areas management education has *a fit with radical creativity*	The areas that require *more attention and development work*
University perspective *(themes: management school focus, business drivers, conceptual definitions, entrepreneurship perspective, epistemic clash, feminist perspective, cultural aspects)*	• A broad consensus is that management education must evolve further to better respond to the needs of modern work environments, **which require different forms of creativity, including radical ones.**	• The business school setting is **not an easy landscape** for radical creativity: the necessary skills, processes, and outcomes for radical approaches tend to be non-standardizable, non-processual, and critical toward the institutions themselves. • Business education views creativity largely as an **incremental add-on.** • The high level of **standardization** in business schools, both in terms of teaching styles, content, and evaluation are in many ways in opposition to the drivers of creativity. • Pedagogic approaches needed for radical creativity are usually **not widely supported** by the university and its faculty.
Educator perspective *(themes: educator perspective, teams and organizing, individual's drivers and traits, leadership perspective)*	• The literature agrees that the educator plays an essential and active facilitation role that in many ways **resembles a creative leader.** • A high emphasis on **framing capabilities** from teachers is highly supportive for radical creativity. • The literature recognizes the radical creativity's need to **extend students' participation in interdisciplinary networks** away from like-minded peers. • The literature emphasizes how educators can enhance individuals' **emotional capabilities** to better benefit from the uncertainty, tension, and diversity prevalent in radical creativity endeavors.	• The management education literature seems to **remain largely silent on how community and collaborative approaches** to radical creativity could be organized in practice. • The efforts to break hierarchies, embrace diversity, and develop emotional competence and awareness can be **cognitively demanding and overwhelming** for the business school students. • Business school educators are constrained by **standardized structures.** • The standardized assessment scales favor **incremental** solutions unless the educator actively navigates the system and creates flexible reward systems.
Teaching practices perspective *(themes: abstract, teaching approaches, specific teaching methods)*	• The literature has approached the implementation of creativity-embracing teaching practice through **various methods**, including visual arts, theater, dance, writing, mindfulness, and music. • The literature notes **a number of concrete teaching techniques** that combine several creativity-inducing characteristics into a specific process or paradigm (such as Design Thinking).	• With widely-applicable frameworks like design thinking management educators have succeeded particularly well in offering instruction related to the analytical and processual side of radical creativity; however, the necessary **unconventional, idealistic, and non-instrumental thinking styles have received less emphasis.**
Capabilities to be taught - perspective *(themes: core capabilities to be taught, individual's drivers and traits, teams and organizing)*	• Creativity-related **key capabilities identified:** i) While framing for opportunities and dilemmas supports creativity in general, its role in radical creativity is particularly prominent, as it strives for unconventional and nontraditional—even imaginative—outcomes. ii) By embracing multiple different thinking styles, the management education literature directly supports radical creativity iii) Awareness of one's potential, motivators, and value systems makes it easier to identify and connect with intrinsic motivations. iv) Empathy can enable collectivity, team building, and harmony for radical creativity. v) Collaboration skills with diverse stakeholders are understood as crucial for creativity, as individual creativity often stems from working with others	• Management education literature focuses primarily on **empathy as an individual capability, while radical creativity** literature focuses on emotional competence as **a team-level skill** and indicates a need for specific collaboration structures. • Management education literature does **not adequately recognize the diversity and scale of collaboration** needed for radical creativity.

Fig. 3. Creativity-related management education from radical creativity perspective.

guidance set by Braun and Clarke (2006), the data extraction, coding, and analysis followed the processes of (1) familiarizing ourselves with the data (choosing the dataset based on the inclusion/exclusion criteria), (2) generating initial codes (data extraction and coding), (3) searching for themes (evaluation and graphical mapping), (4) reviewing themes (grouping and categorizing the themes into higher-level topics), (5) defining and naming themes (refining the specifics of each theme and labeling each theme distinctively), and (6) producing the report (re-evaluating the dynamics between the themes within and between the topics).

In the data extraction, we focused on how creativity is addressed in education in the management education literature. We systematically looked for the topics of creativity and education in the articles. During this process, we collected excerpts of text from articles on these topics. We compiled these excerpts as *data items* (Braun & Clarke, 2006) in spreadsheet files. These data items were then systematically coded and categorized with different labels to create *initial codes*. Following this procedure, the data extraction yielded a codebook consisting of text excerpts from the articles, initial codes indicating the relevance for our integrative review, and references to the original source. Next, we began to search and review for themes in our data (Braun & Clarke, 2006).

We utilized an online whiteboard solution–Miro–to categorize the codes and to search, evaluate, and map the themes graphically (Kiger & Varpio, 2020). We exported all the codes and the references from the codebook to Miro to begin the thematic analysis. The online whiteboard served as a convenient tool for reviewing the content and grouping and categorizing the codes into subthemes and themes. In line with Braun and Clarke (2006, p. 82), each "theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set." Accordingly, the codes for creativity in the management education literature set were gathered into approximately 120 subthemes and then defined, categorized, and named gradually to reveal 14 themes: conceptual definitions, business drivers, abstract teaching approaches, specific teaching methods, management school focus, epistemic clash, core capabilities to be taught, educator perspective, teams and organizing, individual's drivers and traits, leadership perspective, entrepreneurship perspective, feminist perspective, and cultural aspects. As already acknowledged, creativity is a multilevel phenomenon (Mumford et al., 2015), and universities are complex organizations. To provide a clearer structure of this rich and complex data (Braun & Clarke, 2006), the 14 themes were organized into four perspectives based on their agency: the active agent (the university or the educator) or the action or goal (teaching practices and capabilities to be taught). We found that these perspectives best clarified the different views inside each recurring pattern identified in the dataset. There is some overlap among themes and levels, as certain themes apply to multiple perspectives. For example, the theme "teams and organizing" applies to both the educator's perspective and the capabilities to be taught. See Fig. 3 in the following section, which shows which themes were grounded in each perspective. Altogether, the themes and perspectives provided us with the foundation for reporting our findings (Torraco, 2005).

After the thematic analysis, we proceeded to the literature synthesis, a creative activity that aims to produce new ideas and formulations informed by the authors' intimate knowledge of the topic (Torraco, 2005). By comparing the creativity literature to the management education literature, we analyzed how management education perceives creativity and how the approaches used align with the specific characteristics and requirements of paradigm-breaking radical creativity. During our synthesis, we identified both areas of alignment (where management education supports radical creativity) and contradiction (where radical creativity is inhibited).

4. Creativity in management education

Our review study reveals that while creativity-related themes have gradually gained prominence in business schools, management education does not make a clear distinction between radical and incremental creativity–and that hampers the teaching of radical creativity. One can even argue that the management education domain primarily focuses on incremental creativity.

Significantly, our synthesis emphasizes the inherent paradox of incorporating radical creativity across the multiple perspectives present in business school institutions: the broader university perspective, the perspective from the role of educators, and the perspective of what practices to utilize in the classroom and what capabilities must be taught to students. Although many management education domains seek and could benefit from paradigm-breaking creative solutions, many key aspects of radical creativity conflict with the broader perspective of educational leadership in business schools. Also, at the educator level, the team, organizational, and leadership -related drivers have received insufficient attention compared to their relevance to radical creativity.

However, we also found that management education supports certain aspects of radical creativity. When considering teaching practices and capabilities to be taught, the individual capabilities emphasized in management education and the sought-after (but not always realized) education styles largely align with paradigm-breaking thinking. Furthermore, educators have developed various concrete methods and techniques that support more radical forms of creativity. Fig. 3 summarizes our synthesis and analysis of the literature review, considering both how paradigm-breaking radical creativity is supported in management education and where more attention is needed.

4.1. University perspective

In the literature focusing specifically on the university perspective, the themes of "management school focus," "business drivers," and "conceptual definitions" included a persistent call for better creativity teaching models (Baker & Baker, 2012; Dewett & Gruys, 2007; Kerr & Lloyd, 2008; McManus, 2014; Patel & Patel, 2006; Zidulka & Kajzer Mitchell, 2018). Creativity has increasingly found its way into business school curricula, gaining recognition in the most influential accreditation systems (Bertels, 2018; Boulocher-Passet et al., 2016; Dewett & Gruys, 2007). Conceptualizations of creativity in the business and management education literature frame it as a skill or ability that allows for the production of new and useful ideas (Baker & Baker, 2012; Bertels, 2018; Kerr & Lloyd, 2008; Zidulka & Kajzer Mitchell, 2018). Scholars who take an entrepreneurial approach to creativity (identified specifically in our review content

under the theme "entrepreneurship perspective") emphasize the specific importance of creativity as a driver of innovation and entrepreneurial success (Binks et al., 2006; Wade & Piccinini, 2020). Marketing educators also connect creativity to innovative and paradigm-breaking ways of connecting with customers and audiences (Titus, 2007). The broad consensus is that management education must evolve to better address modern work environments and business drivers, requiring diverse forms of creativity, including radical ones (Chandler & Teckchandani, 2015; Dewett & Gruys, 2007; Driver, 2001; Kwong et al., 2012; McManus, 2014; Sunley et al., 2019).

The business school setting, however, presents challenges for implementing radical creativity, manifesting in the theme of an "epistemic clash." Necessary skills, methods, and outcomes for radical approaches are connected to an individual's intrinsic motivators; they are subjective and non-processual (Gilson & Madjar, 2011)—qualities seemingly incompatible with the traditions of the business domain (Assenza, 2017). It also seems that business education views creativity as an incremental add-on—something that can be added to different areas of management studies to foster out-of-the-box thinking, when needed, within existing domains (Dewett & Gruys, 2007; Katz-Buonincontro, 2015; Marques et al., 2013; Zidulka & Kajzer Mitchell, 2018; Ziebro & Northcraft, 2009). However, based on the creativity literature, teaching radical creativity requires a transformative approach and transdisciplinarity to promote knowledge integration and synthesis between domains and reassessment of the institutional structures themselves (Gilson & Madjar, 2011; Tang & Ye, 2015; Ziebro & Northcraft, 2009).

We also observed that a high level of standardization in business schools, regarding teaching styles, content, and evaluation, and even physical classrooms, contradicts the drivers of radical creativity in general (Baker & Baker, 2012; Blasco, 2016; Eriksson & Hauer, 2004). Specifically, standardization discourages necessary risk-taking (Sung et al., 2020; Y. Zhang et al., 2021), exploration, questioning (Lempiälä, 2010), and support for student autonomy (Madjar et al., 2011; Y. Zhang et al., 2021). Assessment styles, in turn, shift the focus to extrinsic rewards, which are particularly detrimental to radical ideas and creativity (Gilson & Madjar, 2011; Laursen & Foss, 2003).

Furthermore, the pedagogic approaches needed for radical creativity lack widespread support from the university and its faculty. The confrontation between business curricula and unconventional creativity teaching is prevalent (Baker & Baker, 2012; Penaluna & Penaluna, 2009; Sunley et al., 2019). Breaking rigid routines and challenging the status quo in teaching methods are inhibited by the wider business school culture (Balau et al., 2020; Z. Liu et al., 2021; Rampa & Agogué, 2021). In addition, critical approaches, such as feminist ones (identified as a specific theme in our review content), were recognized as playing only a small role in the management education literature (Asirvatham & Humphries-Kil, 2021; Kyvik et al., 2012).

Thus, although vision-level support for radical forms of creativity seems apparent in business schools, such visions should be more visible in educational leadership practice (Z. Liu et al., 2021; Xu & Wang, 2019). However, when drawing this conclusion, it must be noted that the majority of the management education literature focuses on Western university systems, with some studies in the Chinese context (Liu, 2006; Martinsons & Brivins Martinsons, 1996). Within our review, the content under the theme "cultural aspects" revealed that cultural and geographical differences may not be fully accounted for in the extant creativity-related management education research (Kyvik et al., 2012; Martinsons & Brivins Martinsons, 1996).

4.2. *Educator perspective*

In considering the role and responsibilities of the educator in management programs, we identified review content that specifically addresses the "educator perspective," as well as themes of "teams and organizing," "individual's drivers and traits," and the "leadership perspective." Here, the literature posits that educators play a crucial role in facilitating creativity, akin to a leader for creativity, through actively framing creative contexts and tasks (Baker & Baker, 2012; Bertels, 2018). Selecting the right frame significantly affects creativity outcomes (Assenza, 2017; Bertels, 2018). Framing also supports students' personal motivations and agency, which fosters their engagement (Sunley et al., 2019). Such framing actions support radical creativity, particularly by striking a balance between persistence and flexibility (Yu & Choi, 2021). The educator's facilitation also encourages the use of multiple perspectives and information sources (A. Zhang et al., 2021). Moreover, an educator's actions demonstrate a clear demand, support, and legitimacy for nonincremental outcomes (Beugelsdijk, 2008; Lempiälä, 2010; Rampa & Agogué, 2021) and provide autonomy support for students (Madjar et al., 2011; Z. Liu et al., 2021; A. Zhang et al., 2021).

In line with the requirements of a creative leader, creativity teachers in management also avoid traditional role divisions and question hegemonic structures (Baker & Baker, 2012; Verduijn & Berglund, 2020). Teachers are called to be not only facilitators and curators but also builders of diverse co-learning communities. Such aims of dismantling hierarchies and role structures are critical for radical creativity (Ziebro & Northcraft, 2009). The management education literature recognizes the need to extend students' participation in interdisciplinary networks away from their like-minded peers (Madjar et al., 2011; Tang & Ye, 2015; Ziebro & Northcraft, 2009). However, the management education literature seems to remain largely silent on how such community and collaborative approaches to creativity can be organized on a wider scale (Dunne & Dougherty, 2012).

Furthermore, creating learning environments where exploration is acknowledged is vital for fostering creativity in management education. This includes creating supportive environments where students are creatively challenged (Snyder, 2003) but can safely make mistakes (Baker & Baker, 2012; Patel & Patel, 2006; Roffe, 1999; Schlee & Harich, 2014). Here, emancipative logic is considered crucial for helping students become aware of their interests and abilities (Assenza, 2017), removing constraints that limit creative aims (Aylesworth & Cleary, 2020), and fostering a culture of creativity, innovation, and risk-taking (Sunley et al., 2019).

Educators are also called to be sensitive to students' emotions, needs (Minina & Nikitina, 2012), and learning styles (Minina & Nikitina, 2012; Sitar et al., 2016; Sosa & Kayrouz, 2020). From the radical creativity perspective, the management education literature emphasizes how educators can enhance individuals' emotional capabilities to better benefit from the uncertainty, tension, and

diversity prevalent in radical creativity (Sung et al., 2020; Ziebro & Northcraft, 2009). However, breaking hierarchies, embracing diversity, and developing emotional competences and awareness can be cognitively demanding and overwhelming (Gallos, 2009; Sunley et al., 2019). Accessing the emotional, motivational, and value-related aspects of learning can be unfamiliar and risky for many business students (Sunley et al., 2019). The focus on collectivity and well-being (Y. Zhang et al., 2021), as well as leader–member exchange (A. Zhang et al., 2021) in the teacher context, indeed supports radical creativity, but there is a risk of learning sessions deviating from their objectives and becoming therapeutic sessions (Katz-Buonincontro, 2015). Here, business educators might lack an understanding of the psychological issues involved, thus raising ethical concerns.

In terms of assessing and evaluating creativity, the management education literature differentiates between intrinsic and extrinsic creativity motivators. Intrinsic factors are crucial during all creative processes (Bertels, 2018; Kyvik et al., 2012; Penaluna & Penaluna, 2009), but clear creativity goals and explicit creativity targets positively impact creative performance across management education levels (Bertels, 2018). However, the assessment system should not discourage risk-taking by pushing to conservative solutions (Baker & Baker, 2012). To this end, arts and design schools have established structured methods to assess creativity (such as critical reviews); however, directly applying such techniques in business school settings can be daunting (Katz-Buonincontro, 2015; Penaluna et al., 2010).

Nevertheless, on a general level, from the perspective of radical creativity, the prevalent assessment paradigms related to creativity in business schools remain problematic (Aylesworth & Cleary, 2020; Baker & Baker, 2012; Bertels, 2018; Blasco, 2016). Management education–compatible assessment criteria for creative work do exist (Jaskari, 2013). However, whereas the management education literature clearly acknowledges the importance of tapping into intrinsic rewards, the standardized business school system largely relies on extrinsic assessment methods. This threatens to restrict the development of persistence needed for radical creativity (mainly available through intrinsic sources) (Gilson & Madjar, 2011) and creates a risk of fixating on achieving the highest grades (Gong et al., 2017). Furthermore, standardized assessment scales favor incremental solutions unless the educator actively navigates the system and creates flexible reward systems (Barba-Aragón & Jiménez-Jiménez, 2020; Laursen & Foss, 2003).

4.3. Teaching practices perspective

Teaching approaches and methods were categorized in our literature analysis as either "abstract," referring to broader categories of paradigms such as the inclusion of arts, or as "specific," referring to specific teaching methods and frameworks such as design thinking. Regarding abstract approaches, the management education literature has explored creativity-embracing teaching practice largely through the adoption of artistic techniques, such as visual arts (Baker & Baker, 2012; Kerr & Lloyd, 2008), theater (Paquelet Moreira et al., 2021), dance (Satama et al., 2021), writing (Katz-Buonincontro, 2015), mindfulness (Glassman & Opengart, 2016; Pavlovich, 2010), and music (Gundry & Kickul, 1996; Katz-Buonincontro, 2015).

From the perspective of radical creativity, arts-based techniques enhance emotional competencies (Sung et al., 2020) and creative self-efficacy (Jaussi & Randel, 2014) and support intellectual capability requirements through critical thinking skill development (Bu et al., 2021). Theater-based methods support idea expression and discussion, fostering the acceptance of uncertainty (Katz-Buonincontro, 2015; Paquelet Moreira et al., 2021). Bodily methods enhance the sensing of each other's presence and facilitate creative collaboration (Satama et al., 2021). Writing techniques develop empathy, reflexivity, critical thinking, and self-awareness (Dewett & Gruys, 2007; Katz-Buonincontro, 2015), connecting directly to radical creativity's intellectual capital requirements (Bu et al., 2021; Tang & Naumann, 2016; Ziebro & Northcraft, 2009). Music techniques promote relaxation (Katz-Buonincontro, 2015), fostering the well-being needs of radical creativity (A. Zhang et al., 2021, Y. Zhang et al., 2021). Music also facilitates a better understanding of complex concepts and enables new perspectives (Katz-Buonincontro, 2015). Finally, with mindfulness, students develop a sense of their own internal motivations and creative potential (Gilson & Madjar, 2011).

The literature also notes a number of specific teaching techniques that combine several creativity-inducing characteristics into a specific process or paradigm. Of these, the most well-known approach is design thinking (Micheli et al., 2019). Design thinking represents "a process, a strategy and a mindset" (Zidulka & Kajzer Mitchell, 2018, p. 750), and its potential is accepted widely in the business domain (Chen et al., 2018; Glen et al., 2014; Micheli et al., 2019; Schumacher & Mayer, 2018), However, from the radical creativity perspective, there are ongoing debates on how design thinking should be taught (Schumacher & Mayer, 2018). Here, Zidulka and Kajzer Mitchell (2018, p. 750) highlighted the "shadow side" of design thinking—that is, the overemphasis on the instrumental side of creativity. The same applies more generally—with widely applicable frameworks such as design thinking, management educators have succeeded particularly well in offering instruction related to the analytical and processual side of radical creativity (Bu et al., 2021; Jaussi & Randel, 2014; Yu & Choi, 2021); however, unconventional (Z. Liu et al., 2021), idealistic (Griffin et al., 2009), and noninstrumental thinking styles have received less emphasis (Zidulka & Kajzer Mitchell, 2018).

4.4. Capabilities to be taught perspective

Management education must consider what skills, mindsets, and competencies students leave with. In the review content, we identified a broad theme of "core capabilities to be taught," including two related themes: "individual's drivers and traits" and "teams and organizing."

The management education literature indicates several creativity-related core capabilities to be taught, in individual and team (or organizing) levels: (1) framing for opportunities and dilemmas, (2) using distinct thinking styles, (3) being consciously aware of one's potential, motivators, and value systems, (4) empathizing, and (5) being able to collaborate with diverse stakeholders. These capabilities are related to seeking novelty in uncertain and ambiguous settings and promoting open, curious, adaptable, flexible,

spontaneous, imaginative, innovative, and resourceful thinking (Gallos, 2009; Ghafar, 2020; Groves & Vance, 2015; Katz-Buonincontro, 2015; Kerr & Lloyd, 2008; Kirby, 2004; Snyder, 2003).

4.4.1. Framing for opportunities and dilemmas

The existing management education literature highlights addressing tensions and dilemmas through framing. Opportunity framing refers to the ability to view a challenge as an opportunity instead of a threat (Bertels, 2018; Penaluna & Penaluna, 2009; Tripsas & Gavetti, 2000). With framing, one can shift the focus away from the obvious, from the unsolvable, and toward a wide spectrum of different design possibilities (Gallos, 2009). Framing can also be used to intentionally create tension-filled design situations, in which tensions and dilemmas are sought out to cultivate creativity (Low & Purser, 2012).

Although framing supports creativity in general (Bertels, 2018), its role in radical creativity is particularly prominent, as it strives for unconventional and nontraditional outcomes (Z. Liu et al., 2021). By moving away from the obvious and allowing for ambiguity, framing teaches students to be persistent and flexible, both of which are necessary drivers of radical creativity (Gilson & Madjar, 2011; Yu & Choi, 2021). Additionally, framing enhances the ability to manage uncertainty (Y. Zhang et al., 2021) and take risks (Lempiälä, 2010). Moreover, the radical creativity literature has highlighted the role that leaders (here, educators) play in framing through support, encouraging risk-taking (Lempiälä, 2010; Malik et al., 2019; Y. Zhang et al., 2021), and preventing exploration from becoming unrealistic (Gong et al., 2017).

4.4.2. Using distinct thinking styles

The management education literature highlights the importance of using critical thinking (Baker & Baker, 2012), lateral thinking (Binks et al., 2006), divergent thinking (Eriksson & Hauer, 2004; Penaluna & Penaluna, 2021), and nonlinear thinking (Groves & Vance, 2015) in driving creativity; they enable students to reject mechanistic routines (Balau et al., 2020; Rampa & Agogué, 2021). Such thinking styles also enable individuals to analyze and question one's creative actions (Baker & Baker, 2012; Zidulka & Kajzer Mitchell, 2018). Here, management education directly supports radical creativity—the acceptance and utilization of multiple ways of thinking leads to radical creativity (Y. Liu et al., 2021).

4.4.3. Being consciously aware of one's potential, motivators, and value systems

The management education literature recognizes that a developed sense of self-awareness supports creativity by assisting in scanning the environment for opportunities, adapting to different situations, and reasoning on an abstract level (Pavlovich, 2010). In addition, greater awareness enables learners to move past common thinking patterns (Sunley et al., 2019). In education, it is crucial to be aware of personal motivational drivers and the overall value systems related to tasks that require creativity (Bertels, 2018; McManus, 2014).

Regarding the antecedents of radical creativity in particular, on the individual level, such an emphasis on awareness in management education makes it easier to identify and connect with intrinsic motivations (Gilson & Madjar, 2011). The literature also highlights the role leaders (educators) can play in this—awareness of team members' intrinsic motivators allows the establishment of flexible reward systems that tap into such motivations (de Carlo, 2005; Laursen & Foss, 2003; Malik et al., 2019). Furthermore, in artistic exercises, the education literature highlights the idea that awareness allows for the recognition of one's creative potential (Kerr & Lloyd, 2008) and the discovery of creative self-efficacy (Aylesworth & Cleary, 2020), which is particularly important with radical creativity (Jaussi & Randel, 2014).

4.4.4. Empathy

Empathy, defined in the creativity-related management education literature as the "ability to care about another person's feelings and want justice for that person" (Katz-Buonincontro, 2015, p. 84) is considered an important skill to be taught, but its realization is more problematic. On the one hand, the need to master soft skills, such as empathy, is clearly recognized (Sosa & Kayrouz, 2020; Sunley et al., 2019). On the other hand, management education has traditionally faced challenges in teaching such skills (Katz-Buonincontro, 2015; Sunley et al., 2019). This paradox is a point of concern, as empathizing in particular is at the heart of design- and creativity-driven problem-solving methods (Glen et al., 2014).

Whereas empathy has not been identified as a characteristic of radical creativity, emotional competence has been (Sung et al., 2020). Empathy enables collectivity, team building, and harmony (Chen et al., 2021; Tang & Naumann, 2016), as it can create a sense of safety when taking risks (Xu & Wang, 2019). However, the slight difference between empathy and emotional competence highlights a conceptual disconnection—the management education literature focuses primarily on empathy as an individual capability, while the radical creativity literature focuses on emotional competence as a team-level skill and indicates a need for specific collaboration structures (Venkataramani et al., 2014; Ziebro & Northcraft, 2009), as well as a broader interorganizational approach (Balau et al., 2020).

4.4.5. Ability to collaborate with diverse stakeholders

Finally, in the management education literature, collaboration is understood as crucial for creativity, as individual creativity often stems from working with others (Baker & Baker, 2012; Frolova et al., 2021; Gundry et al., 2014; Sitar et al., 2016). Collaboration should span professional, cultural, disciplinary, and social boundaries, as well as embrace integrative thinking (Karakas, 2011; Robertson et al., 2012; Sitar et al., 2016). Satama et al. (2021) also emphasized power distribution within collaborative cohorts. Moreover, tensions between diverse people can result in "creative abrasion," benefitting creativity (if maintained at tolerable levels) (Roffe, 1999, p. 225).

However, as touched upon earlier, the management education literature does not adequately recognize the diversity and scale of collaboration needed for radical creativity. Radical creativity is particularly driven by team diversity, large-scale collaboration, collaborative decision-making, and information sharing (Beugelsdijk, 2008; Doehne & Rost, 2021; Lynch & West, 2017; Rampa & Agogué, 2021; Tang et al., 2017; Ziebro & Northcraft, 2009). When creative collaboration is scaled up, teams and networks also require shared and distributed leadership (Zhu et al., 2018). Thus, while the need for collaboration is correctly recognized in the management education literature at the vision level, there is a lack of focus on practical capabilities and scales related to operating in and managing diverse multidisciplinary and self-organizing teams (Ben-Menahem et al., 2016).

5. Discussion

We next describe the actions needed to strengthen the path toward paradigm-breaking radical creativity in management education. We abstract the results of our review and describe the requirements of (1) switching from standards obedience to challenging the status quo, (2) changing the focus of learning from disciplinary individuals to interdisciplinary teams, (3) transforming the educator's role into a creative leader, and (4) consolidating and advancing creativity-inducing methods.

After this macro-level analysis, we assess how the implications of our results vary among major management education domains. A pertinent question often asked is whether the business school is a place for radical creativity (Assenza, 2017; Kirby, 2004; Luczkiw, 2007). Businesses need momentum, efficiency, and institutional stability, which might call for more incremental, rather than radical, forms of creativity. However, management education is not homogeneous; there are domains, such as entrepreneurship and marketing, that have traditionally been more receptible for paradigm-breaking ideas and even need them to reach their aims. Such thinking that highlights the receptivity to radically new ideas is evident in many pivotal works in the managerial domain, for example, on disruptive innovation (Christensen, 1997), ambidextrous organizational capabilities (Tushman & O'Reilly, 1996), or technology brokering (Hargadon & Sutton, 1997). Similarly, there are areas in the business school that are better suited to incremental creativity.

5.1. Actions needed when seeking radical creativity

5.1.1. From standards obedience to challenging the status quo

We now turn to the actions needed for educators seeking to develop management education toward radical creativity, abstracting the results of our review to calls for action. Based on our results, a major hurdle with using radical creativity in management education is the potentially major mindset mismatch between business school traditions. Most importantly, the radical creativity literature has identified the need to support radical endeavors at the leadership level by setting out expectations (Xu & Wang, 2019), which, in the context of management education, means expecting students to challenge the status quo. This means that critical, questioning, and reflective perspectives should be used in teaching and learning (Verduijn & Berglund, 2020), including the content to be learned, methods to be used, contexts in which knowledge is to be applied, and the institution's boundaries for creative actions. Unnecessary standardization should be avoided, and autonomy should be supported (Y. Zhang et al., 2021) so that the existing structures do not render radical endeavors quasi-radical (sounding radical but incremental at their core). Even assessments should acknowledge the idea of breaking paradigms (Blasco, 2016). Furthermore, as radical creativity is inherently linked to intrinsic motivations and personal value systems (Bertels, 2018; Kyvik et al., 2012; Sunley et al., 2019), business education would require a lot of subjectivity in its practices. Questioning and critical perspectives should sometimes reach the level of creative deviance—rebellious behavior—that actively strives to defy institutional norms and orders (Z. Liu et al., 2021). All this is indeed in stark contrast to the business world's analytical and objective—and, to a certain extent, nonideological and apolitical—approaches.

5.1.2. Changing the focus of learning from disciplinary individuals to interdisciplinary teams

The overemphasis on focusing on individuals in teaching and learning—and having too little focus on the teams and compositions of teams—should be addressed. Radical creativity is largely about benefitting from diversity in large-scale collaboration (Balau et al., 2020; Jaussi & Randel, 2014; Madjar et al., 2011; Tang et al., 2017; Venkataramani et al., 2014; Ziebro & Northcraft, 2009) and cultural and disciplinary diversity (Beugelsdijk, 2008; Doehne & Rost, 2021; Madjar et al., 2011). Although the management education literature discusses collaboration and teamwork skills (Baker & Baker, 2012; Karakas, 2011; Robertson et al., 2012; Satama et al., 2021), the focus in teaching, the level of detail in teaching content, and practical teaching facilitation do not reach the specifics of how to build collaboration that supports radical creativity in particular (Tang & Naumann, 2016; Venkataramani et al., 2014; Ziebro & Northcraft, 2009).

Thus, the strong focus on the individual level in management education should be augmented by acknowledging the extensive discussions happening in the fields of diverse, multidisciplinary, and self-organizing teams (Ben-Menahem et al., 2016), shared and distributed leadership (Zhu et al., 2018), and innovation networks and ecosystems (Adner, 2017; de Vasconcelos Gomes et al., 2018). Furthermore, management education should be more closely connected to active discourses on building a creative culture in organizations (McLaughlin et al., 2008) and organizational creativity at large (Amabile & Pratt, 2016). These new connections should not only happen at the level of content to be taught but also in terms of how learning is facilitated: there should be a transition from teaching individuals to enabling team learning.

5.1.3. Transforming the educator's role into a creative leader

Radical creativity needs distinct leadership; therefore, the desired role of educators—and educators' sought-for teaching styles when teaching creativity—must closely resemble those perceived as beneficial for leading radical creativity. Here, management

education has already paid particular attention (however, mostly only at the individual level; see the previous sections) to nurturing internal motivation, value system awareness, and the personal creativity goals of students (Bertels, 2018; Kerr & Lloyd, 2008; Kyvik et al., 2012; Sunley et al., 2019). Embracing risk-taking and a diversity of reward schemes have been analyzed, including how educators should set targets for creativity and how creativity should be assessed (Baker & Baker, 2012; Katz-Buonincontro, 2015). Moreover, the existing literature has highlighted how creativity educators in management should foster learner autonomy and emancipation (Blasco, 2016; Sunley et al., 2019). In addition, personal engagement in creative processes has been explored in the analysis of the educator's role, advocating for educators taking an active stance in guiding learning but avoiding unnecessary hierarchies (Baker & Baker, 2012; Verduijn & Berglund, 2020). The existing literature has also highlighted the traits of balancing, innovating, and promoting well-being (Pirson, 2020), as well as frame setting (Bertels, 2018), as desirable skills for educators.

However, although the management education literature indeed recognizes all these traits, the prevailing picture of business school teaching is still quite different (Baker & Baker, 2012; Liu, 2006; Wade & Piccinini, 2020). Thus, while the developed picture of an ideal creativity educator in management seems to serve as a surprisingly suitable role model for a leader of radical creativity, there needs to be a transition connecting the ideal and anecdotal types to real practice. In seeking radical creativity, teaching for creativity and creativity leadership should more explicitly emphasize the mentioned qualities and the importance of the educator as a creative mentor and role model both in individual- and team-level learning.

5.1.4. Consolidating and advancing creativity-inducing methods

Finally, as the review results exhibited, business educators have recognized and further developed several creativity-inducing teaching methods, ranging from productized thinking tools and exercises to endeavors in arts, theater, music, and creative writing (Baker & Baker, 2012; Dewett & Gruys, 2007; Katz-Buonincontro, 2015; Kerr & Lloyd, 2008; Micheli et al., 2019). Our review identified that such methods have a considerable impact on driving radical creativity in particular. However, the methods mentioned, apart from design thinking, have not yet gained large-scale traction and have remained as individual domains' or teachers' small-scale practices and experiments. More systematic and inter-domain initiatives to consolidate such approaches could generate more insights into the methods' potential in driving radical creativity, as well as ensure that methodological progress is more visible in creativity-related management education.

Regarding productized methods in particular, embracing more radical forms of creativity would also require the inclusion of a stronger emancipative component in the approaches—the frameworks should go deeper into the individuals' value systems and also wider into systems and networks while still remaining pragmatic. For example, design thinking is an efficient framework for enhancing management students' creativity skills in many management domains, but too often, the application remains in the incremental and instrumental mode (Zidulka & Kajzer Mitchell, 2018). Thus, to develop productized methods that are more supportive of radical creativity, they must be extended in intuitive, ideological, institutional, systems, and even political directions while keeping the level of actions concrete.

5.2. The case for radical creativity within different management education domains

To position the implications of our research better within management education practice, and to set path for more domain-specific investigations, we next explore the management education domains that our literature set directly addresses—entrepreneurship, marketing, strategic management, leadership, operations management, and accounting education—and highlight the potential and limitations of radical creativity within them. We omitted domains that have not been considered within the analyzed literature, such as finance and economics, from this analysis.

5.2.1. Entrepreneurship

The dynamic nature of entrepreneurship is deeply intertwined with creativity, manifesting in various forms, ranging from incremental to radical thinking (Binks et al., 2006). Thriving entrepreneurial firms are led by intrinsically motivated entrepreneurs who capitalize on paradigm-breaking opportunities in the fashion of creative destruction (Schumpeter, 1942). However, business development also includes many stages that require paradigm-preserving creativity, the use of logic, and analytical rigor (Binks et al., 2006). Entrepreneurship is influenced, in particular, by the incremental pace of external factors, such as funders or regulatory frameworks (Luczkiw, 2007). Thus, entrepreneurship education must be developed to nurture radical creative approaches in seeking business opportunities while being compatible with the inertia and structure of the whole business development process and the different stakeholders involved.

5.2.2. Marketing

Along with entrepreneurship, the creative imperative is also strong in marketing (McCorkle et al., 2007). The effectiveness of marketing is inherently characterized by its ability to connect with audiences through unique and nontraditional approaches. Marketing educators are advocates for innovative paradigm-breaking thinking (Titus, 2007), aligning with radical creativity. However, there is no significant evidence that marketing students are more (or less) creative than their peers in other majors (McCorkle et al., 2007). Reluctance in embracing uncertainty and a limited interdisciplinary outlook prevails (Titus, 2007). To address this situation, educators have introduced many creativity exercises to boost the quality of students' ideas (Chen et al., 2018; McCorkle et al., 2007; Ramocki, 2014; Titus, 2007). Notably, the introduction of design thinking into marketing pedagogy has aimed to improve the originality and usefulness of students' creative outputs (Chen et al., 2018; Schiele & Chen, 2018). Thus, there is potential and a need for radical creativity in marketing education, but creativity-related developments must be done systematically; it might be challenging to

educate for radical creativity without first addressing the need for more consolidated skills for incremental creativity.

5.2.3. Strategy

Firms' strategic objectives vary from conservative ones to the more audacious "blue ocean" strategies demanding path-breaking radical creativity (Kim, 2005). Nevertheless, even in situations that seek paradigm preservation, the heightened environmental turbulence the organizations confront demands proactive and, at the least, incrementally creative approaches to environmental change (Bourmistrov & Åmo, 2022). Consequently, strategic management education must complement its traditional analytically driven methods by fostering insight, foresight, intuition, and creativity (Bourmistrov & Åmo, 2022; Grant & Baden-Fuller, 2018). When paradigm-breaking thinking is needed in particular, management students' challenge of being, at times, ill-equipped to manage ambiguity and uncertainty must be addressed (Grant & Baden-Fuller, 2018). Thus, more emphasis on creativity-related knowledge and skills is needed, both from incremental and radical perspectives, contingent on the business situation at hand.

5.2.4. Leadership

The creativity literature considers the influence of leadership to be an important predictor of both incremental and radical creativity. However, some types of leadership have been shown to have the opposite effect on radical and incremental creativity (Li et al., 2019), such as in cases of managing individual's creative expectations, promoting autonomy, applying reward schemes, and managing creative team diversity (Beugelsdijk, 2008; Doehne & Rost, 2021; Rampa & Agogué, 2021; van Knippenberg & Schippers, 2007; Xu & Wang, 2019). Such a distinction is particularly important for our study, as leadership for radical creativity remains under-addressed in creativity-related management education. Thus, leadership education should carefully develop its competencies and teaching content regarding teaching skills for different forms of creativity.

5.2.5. Operations management

Operations management involves a pressing need to uphold standardized, efficient processes that ensure consistency and predictability; therefore, combining operations management and creativity has received very little attention in the management education discourse. However, according to Shalley and Gilson (2017), creativity is needed in this domain, given the compelling need to cultivate an operations environment that champions creative problem-solving and innovation. Because the domain is most attuned to refining and optimizing existing processes in which improved efficiency or effectiveness is sought without a complete overhaul of existing systems, the domain aligns best with incremental creativity. However, radical creativity also finds some resonant applications when it comes to architecting novel paradigm-shifting operational systems (Shalley & Gilson, 2016).

5.2.6. Accounting

Accounting education aligns mostly with incremental creativity, but calls for more radical directions exist. The domain is historically centered on developing procedural and technical knowledge, but the field is undergoing a paradigm shift in response to a rapidly changing socioeconomic landscape, including the increasing weight given to ethics and multistakeholder perspectives (Rossetto & Chapple, 2019). Although accounting might historically be a domain "not normally associated, except ironically, with creativity" (Kleiman, 2008, p. 215, in Rossetto & Chapple, 2019), the profession's evolving demands suggest that students could benefit from out-of-the-box thinking and diverse perspectives (Rossetto & Chapple, 2019). Skills associated with critical thinking, self-reflection, proactivity, and transdisciplinarity are prioritized (McGuigan et al., 2021; McGuigan & Kern, 2016), aligning with incremental but also partly with the skills for radical creativity. However, applying any transformative approach to accounting education faces structural and ethical challenges. Radical changes might dilute the discipline's technical core and sacrifice standards and regulation compliance. Thus, accounting educators need support in incorporating innovative teaching and creative modules while balancing the enduring technical rigor essential to the profession.

6. Conclusion

Our study has brought to light the current state of creativity-related management education when teaching for paradigm shifts, as well as potential ways forward to further integrate radical and paradigm-breaking creativity -related approaches with business school educational leadership and practice. Despite the strong contrast between radical creativity and the extant methods of teaching management, there is potential for radical creativity in several management education domains. Nevertheless, careful consideration of radical creativity's benefits for students and industries, as well as radical creativity's fit for the taught domain, should be considered. Our review results and related discussions offer a structure for such analysis and guidance for the actions needed if radical creativity is seen as a desirable development area.

Our review study also identified several opportunities and boundaries for future research. First, connecting to the *call for defiance of business school standards* highlighted in our discussion, although the management education does not too much emphasize radical creativity directly, there are certainly programs, courses, and teaching practices (and whole domains, as described earlier) within management education that already align with the aims of radical creativity. These cases should be identified, and more empirical research should be conducted, particularly regarding radical creativity outcomes. Do the efforts add more value to the school and its graduates? What challenges emerge for faculty and students when such initiatives are positioned within more traditional business school settings?

Second, the increased emphasis on *interdisciplinary learning and collaboration within radical creativity* raises questions about how the technical core of management disciplines can be maintained. How can business schools broaden the traditional focus of management

education to incorporate interdisciplinary tasks, courses, and programs without compromising the intellectual core of business disciplines? What about the heritage and prestige of such disciplines? Or is such heritage and prestige even desirable?

Finally, due to the requirement to include *reflexivity, subjectivity, and intuition in management education*, there is a need to better understand the moderating factors of radical creativity. To what extent are the implementation and impact of radical creativity efforts in management education discipline-, context-, or culture-specific? How can business schools support radical creativity that challenges traditions while providing insights that are universally applicable and contestable? Or should we instead resort to an in-depth contextual approach?

Author statement

Ville Eloranta: Conceptualization, Investigation, Methodology, Writing - Original Draft, Writing – Review & Editing Esko Hakanen: Methodology, Investigation, Writing - Original Draft, Writing – Review & Editing Claire Shaw: Investigation, Writing - Original Draft, Writing – Review & Editing.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used OpenAI ChatGPT (GPT-4 Turbo) to improve text clarity and flow. After using this service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Declaration of competing interest

We report no conflict of interest for our manuscript.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

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