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Implications of the factors of the Creative Leadership Model in the performance of technological base creative teams: A Scope Review

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SUMMARY

Background: The Creative Leadership Model (MLC) highlights how benign structures are useful for teams; as the processes of overcoming barriers tothe performance of creative teams are formulated, prese nts the Team Factors Inventory instrument as aperformance metric, and finally sorts teams according to their performance.

Objective: Thefollowing work aims to clarify the implications of thefactors of the Creative Leadership M odel in theperformance of creative teams in technology based companies. Project: Online databases were accessed in order to identify published articles fromoriginal studies that open the understanding of theML C MLC and fit the items of the research, were excluded from articles that deviate the purpose of the study as the benign structures in health, barriers in construction. The sources of evidence for this work are reported in articles that present experiences, observations made, tests.

Methods: The scoping review method was used which followed the steps of PRISMA-ScR which includes: titles and review questions, inclusion criteria, participants, concepts and context, types and sources of evidence, search strategy, evidence screening and selection, evidence extraction, data analysis, presentation of results and conclusions. The meta analysis served to combine the data from four approaches around the Creative Leadership Model.All data presented at each stage was obtained taking into account the search strategy in databases such as Scopus, WoS, B-on and EThOS. The searches were conducted in English and Portuguese during the month of December 2021.

Results: The results of the studies were presented in an identification flowchart (PRISMA-ScR) a table of studies done on the Model and its factors according to publication, authorship, journal/Institution, title, and type of publication was presented. Results shows that 320 Potentially relevant Articles obtained from the search strategy on various platforms and 28 articles kept for scoping review were found.

Conclusions: It was concluded that the implications of leadership model factors on the performance of technology-based creative teams are increased production, competitive advantages in new product launches, collective failure if the product is not understood by the customer.

Keywords: Creative Leadership, Creative Teams; benign structures, team factors inventory, innovation processes, and the development of creative teams.

1. Introduction

To describe research approaches, review methods are labelled to the literature. Arksey and O'Malley (2005) list some labels as: systematic review; meta-analysis; rapid review; literature review (traditional) ;narrative review; research synthesis; and structured review.

Coelho, et al. (2021) establish a comparison between systematic and scoping review, according to which the scoping review is more comprehensive than the systematic review and cite (Peters et al.,

2020) stating that, the eligibility criteria of the scoping review studies are less restrictive.

For Arksey and O'Malley (2005) scoping reviews are a form of knowledge synthesis that incorporates a range of study designs to comprehensively summarise and synthesise the evidence with the aim of providing practical, programme and policy information and guiding future research priorities.

The above concept is shared by Colquhoun et al. (2014) according to them, a scoping review or scoping study is a form of knowledge synthesis that addresses an exploratory research question that aims to map key concepts, types of evidence and gaps in research related to a defined area or field by systematically searching, selecting and synthe-sizing existing knowledge.

According to Peters et al.(2020) scoping review, sometimes also called "mapping review" or "scoping study", is an approach to evidence synthesis that is increasingly being used internationally. this concept is shared by Pollock et al.(2021), they tell us that scoping reviews are an invaluable form of evidence synthesis. Considering scoping as evidence synthesis, Rickards and Moger(2000) state that the Creative Leadership Model results from empirical evidence provided from a series of studies of project teams in industrial settings.

The evidence of the referred Model, due to its conceptual nature is established by its authors (Rickards & Moger 1999) in two structuring axes: (1) organizational creativity (which examines the creative performance of teams); and (2) leadership (which examines the behavior of people in interpersonal relationships influenced by various leadership styles)

The evidence presented above motivates research into the implications of the Creative Leadership Model factors on the performance of creative teams, it opens up the conduct of a Scoping Review which initially by Joanna Briggs Intitute (JBI) guidance used the terminology "systematic scoping review and in the latest update, the nomenclature has been refined to simply "scoping reviews" Peters et al. (2020).

Rickards and Moger (2000, p.275) state that:

The Creative Leadership Model maps the impediments to the process of team formation and performance, also known as barriers to creative team performance, to carry out this exercise the following question is asked: what mechanisms are at play when a team fails to achieve expected performance... and what mechanisms lead to exemplary performance?

To map the said mechanisms a methodological framework was followed whose initial studies were done in 2005 by Arksey and O'Malley (2005).De Oliveira et al (2021) pay homage to the foundational theorists of the scoping review approach who came through the Joanna Briggs Intitute (JBI)namely: 1) Arksey and O'Malley2) Levac, Colquhoun and O'Briene 3) Peters and collaborators.

2. Stages for scoping review

Initially Arksey and O'Malley's (2005) stages were widely used for theoretical references containing six stages, later they were improved by Peters and Godfrey (2015) the latter add three more stages in addition to the six initially proposed by Arksey and O'Malley (2005).

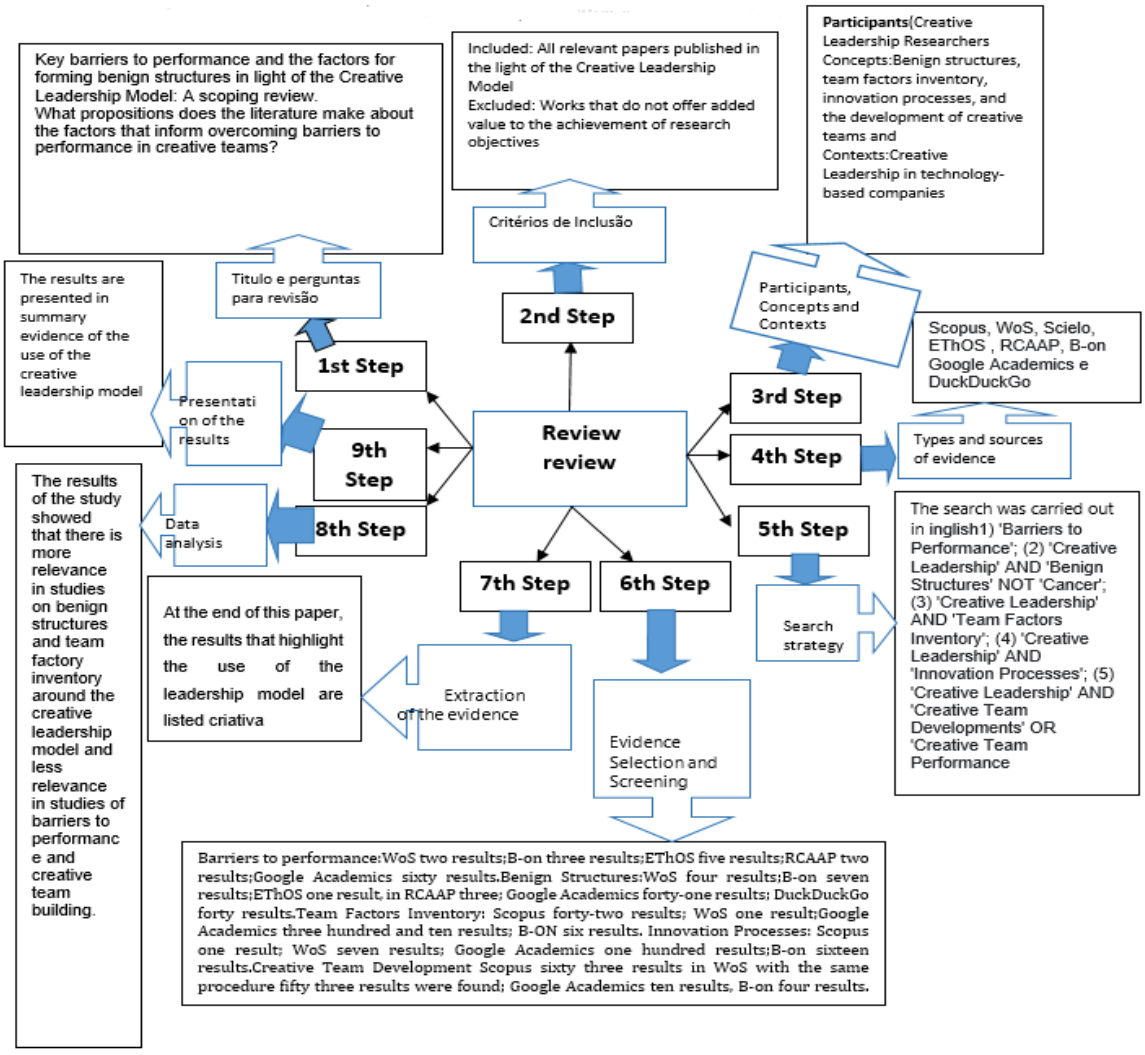
According to Pollock et al. (2021) it is recommended that the Joanna Briggs Intitute (JBI) approach be followed as it is, to date, the most rigorous and defined methodology. The authors clarify that the JBI approach for scoping reviews contains nine stages (Peters, Godfrey, et al., 2020) and expands upon the work of Arksey and O'Malley (2005) and Levac et al. (2010).

The methodological framework for scoping review was accompanied by a Preferred Reporting Items for Systematic review and Meta-Analysis - Scoping Review (PRISMA-ScR) reporting script formed by a minimum set of 27 items (and two optional).

Peters et al.(2021) describe this method as an updated guidance for conducting a scoping review, referencing its steps such as: titles and questions for the review, inclusion criteria, participants, concepts and context, types and sources of evidence, search strategy, evidence screening and selection, evidence extraction, data analysis, presentation of results and conclusions. For literature review we followed the items recommended by PRISMA-ScR, the latest update By Peters et al. (2021).

The figure below presents the synthesis of the steps of the scoping review intended to be performed to the proposed theme in light of Peters et al. 2021

Figure 1: Scope review stages to key performance barriers



Source: Adapted from Peters et al. 2021

2.1 Titles and review questions

According to Peters et al.(2020) The mnemonic "PCC" (population, concept and context) is recommended as a guide to construct a clear and meaningful title and inclusion criteria for a scoping review. In light of this the guiding theme for this review is: key barriers to performance and the factors for forming benign structures in light of the Creative Leadership Model: A scoping review.

2.1.1 Question for review

Throughout their studies Rickards and Moger (2000) observed series of factors linked to the development of group or individual activities that leads creative team performance and strategies in leadership relationships. The referred activity triggers terms that conceptualize the main review question such as benign structures, team factors inventory innovation processes, and the development of creative teams these terms were systematically mapped from other works already conducted on the Creative Leadership Model, to identify the gaps, this challenge arises to answer the following question: What proposals the literature presents on the implications of the factors of the Creative Leadership Model on the performance of technology-based creative teams?

2.2 Inclusion Criteria

Articles published in internationally recognised scientific journals or peer reviewed journals were eligible for this work, papers published since the final stage of the Model's publication (2001) that have a conceptual structure linked to the Creative Leadership Model described in English and Portuguese were analysed.

Theses and dissertations available in repositories that do not add value to the study as well as chronicles or any other type of text that does not fit the strategy were excluded.

2.3 Participants - concepts and contexts

To conveniently group the evidence we conceptualised three components according to the guidance of the Joanna Briggs Institute manual which reports the existence of a variety of mnemonics for different types of review (and research) questions. It is suggested that the mnemonic "PCC" is used to build a clear vision and meaningful title for a JBI scoping review.

The mnemonic PCC stands for Population, Concept and Context. Population: creative teams including leaders; Concepts: benign structures, team factors inventory, innovation processes, and the development of creative teams were defined for the present study. Context: Technology-based companies in Disruptive Innovation.

2.3.1 Participant

The participants of the review (population) have specific characteristics, these are teams that produce and disseminate the knowledge base, and their leaders, according to the criteria of leadership and team performance. The participants of this study are: Creative Leadership research teams, who are engaged in the search for knowledge about the main barriers to performance and the factors for forming benign structures in the light of the Creative Leadership Model.

2.3.2. Concept

For the present scoping review the concepts of: benign structures, team factors inventory, innovation processes, and the development of creative teams were considered, these concepts were attached to the searches, screening and results.

As used by Rickards et.all (2001). to capture the essential aspects contained in the definitions the items were credited by the researchers and consequently explore the barriers in the team, leader and performance relationship.

2.3.3. Context of the review

The context of this study is research done on technology based firms in disruptive innovation.

2.4 Types and sources of evidence

The grey literature in its generality facilitated the search for inaccessible documents in other sources. In many databases the articles remained closed even with the use of the VPN made available by the Universidade Portucalense, thus the combined analyses made around the Creative Leadership Model, the questionnaires used to evidence the effects of the TFI instrument the other quantitative and qualitative studies were also found through the use of bases such as Scopus, WoS, Scielo, EThOS , RCAAP, B-on and, most of the searches were done during December 2021 and part of January 2022, at some point EThOS and RCAAP repositories and search engines such as Google Academics and DuckDuckGo were also consulted.

2.5 Search strategy

The search was done in English by parts, thus we searched for (1) 'Barriers to Performance'; (2) 'Creative Leadership' AND 'Benign Structures' NOT 'Cancer'; (3) 'Creative Leadership' AND 'Team Factors Inventory'; (4) 'Creative Leadership' AND 'Innovation Processes'; (5) 'Creative Leadership' AND 'Creative Team Developments' OR 'Creative Team Performance'.

2.6 Evidence screening and selection

The search was conducted to analyse five different approaches to the Creative Leadership Model. The screening and selection of evidence was drawn from the following data:

For selection of the subjects related Barriers to performance and the factors for benign structure formation in English two results were found in WoS, three results in B-on, five results in EThOS, two results in RCAAP, sixty results in Google Academics.

For Creative Leadership AND Benign Structures approach (in English) four results were found for WoS, seven results in B-on and in EThOS one result, in RCAAP three results were found, Google Academics forty-one results and in DuckDuckGo forty results.

For the selection of Team Factors Inventory concepts the Boolean operator AND was used in the combination of Creative Leadership and Team Factors Inventory in Scopus no results were found when searching only Team Factors Inventory in the same platform forty-two results were found, for WoS in the combination of both only one result was found, for Google Academics three hundred and ten results were found, being only the most recent ones analysed, the combination of both was made in B-ON six results for these last two the AND operator was used.

For Innovation Processes the Boolean operator AND was used to combine Creative Leadership AND Innovation Process, in Scopus only one result was found, in WoS seven results with the placement of high commas in Innovation Processes, for Google Academics one hundred results were found with the placement of high commas in Innovation Processes and Creative Leadership, and in B-on sixteen results with the placement of high commas in Innovation Processes and Creative Leadership.

For the approach on creative team development the AND operator was used in Scopus creative team development and creative leadership model, having found in the same platform sixty three results in WoS with the same procedure fifty three results were found, in Google Academics using the same procedure only with high commas in the first topic, ten results were found, B-on using the same procedure only with high commas in the first topic four results were found.

2.7 Evidence Extraction

The extracted data pursue the fulfilment of the research objective: to clarify the implications of the factors of the Creative Leadership Model on the performance of creative teams in technology-based companies. Consequently answering two questions of this research which are:

(1)Are the benign structures identified in the Creative Leadership Model effective in breaking down barriers to the development of creativity in work groups?(2)What other factors inform the overcoming of barriers to the performance of creative teams?

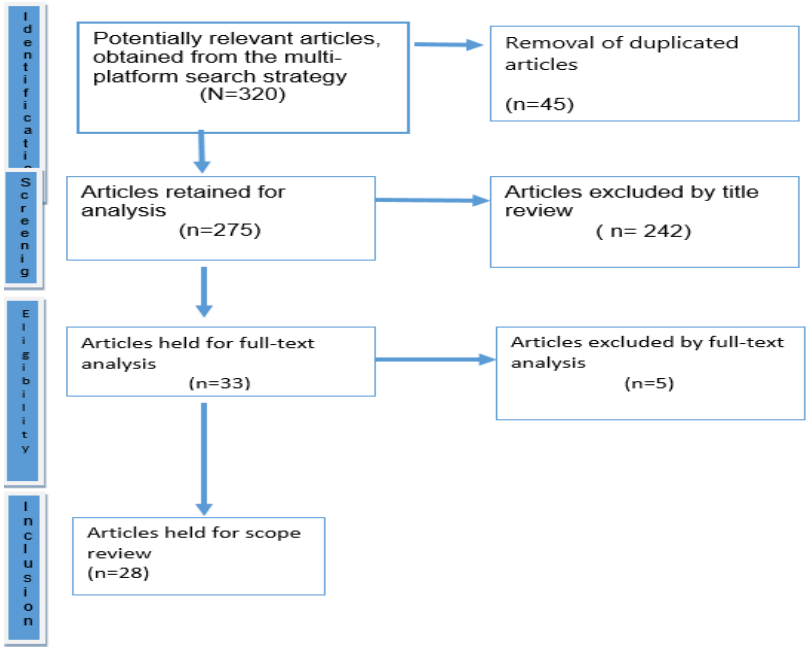
According to Peters et al(2020) the scoping review protocol should include information on the potential data that can be extracted from the included sources of evidence to enable transparency and clarity. The in reference authors guide the following: after reading several articles, authors may wish to list how these results were measured to gain a thorough understanding of how the researchers applied them and arrived at the subsequent results.

In the section on presentation of results and conclusions there is an illustrative table that helps to understand the above recommendation.

2.8. Data analysis

The data resulting from the research on barriers to performance, benign structures, the combination of creative leadership and team factory inventory, creative leadership and innovation processes as well as creative team development and leadership show that there is more relevance in the studies on benign structures and team factory inventory around the creative leadership model and less relevance in the studies of barriers to performance and creative team building.

Fig 2: Flowchart of identification and analysis of the studies included in the review (PRISMA-ScR)
Fonte: O autor (2022).



2.9 Presentation of results and conclusions

2.9.1.Main barriers to performance

Rickards and Moger (2000, p.275) carried out studies to the team development model (Tuckman,1965) and modified the previous Model included two barriers.

When talking about barriers to team development Rickards and Moger (2000) define them as impediments that arise both from externally imposed restrictions (environmental press) and internally generated restrictions (socially constructed barriers). In classifying them the authors present two types of barriers.

The first type of barrier is behavioural. According to the authors this type of barrier is the weak one and represents the interpersonal and intrapersonal forces that must be overcome before norm formation in the terms of Tukman's model. It is considered weak due

to the fact that it provides only a temporary obstruction that most teams overcome.

Also in their classification the authors consider the second barrier as strong, this one linked to performance, represents the forces that are overcome when a team exceeds conventional expectations within Creative Leadership Processes in Project Team Development.

In the first and second barrier the authors do not specify exactly the types of behaviours or the nature of performance that is to be achieved they simply use the term barrier without attempting to produce a fully explicit account of its nature Rickards and Moger (2000, p.276) in this Chen, MH, and Agrawal, S. (2017) say that although various factors shaping team creativity have been examined before, communication barriers have received relatively less attention.

Rickards and Moger (1999) state that the weakest barrier requires help with interpersonal relationships. The strongest barrier requires helping performance levels to exceed established and accepted norms

Even so, the studies of Rickards and Moger (1999) prioritize the action of the leader who in the face of barriers that hinder creativity introduces a set of factors considered as structures that diminish the impact of the lack of communication, information or even knowledge.

In order for barriers to be overcome, the authors suggest benign structures made up of seven factors such as(1)Understanding Platform (2); Shared Vision;(3)Climate;(4)Resilience; (5)Own Ideas;(6) Network Activation;(7)Learning from Experience.

2.9.2. benign structures

The formulators of the Creative Leadership Model consider benign structures as supportive structures for creativity and innovation, they emphasize this sentence using the example of brainstorming, as a benign structure originally introduced to overcome inhibitions in business meetings (Rickards and Moger 2000), the authors, highlight this fact by generalizing the role of benign structures in combating the bad habits that hinder creative thinking and replacing them with more creative thoughts.

For Chen (2001) benign structures become more obvious in the application of creative problem solving techniques presented by facilitative and skilled leaders.

According to Muzzio & Junior (2018) the leader should also encourage individuals to behave proactively according to a creative perspective; in this way, leaders can fulfil their role of leading processes that result in increased creativity.

The main gap in these frameworks is the identification of more detailed characteristics of benign structures under varied or contingent group conditions (Rickards & Moger 2000).

The introduction of protocols for better creative team performance was also studied by Sternberg et al. (2004) proposed eight different factors of exercising creative leadership and influencing followers these factors are presented at the propulsion level namely: replication; redefinition; forward incrementation; advanced forward incrementation; rescaling; reconstruction; reboots and synthesis.

In the Creative Leadership model, Rickards and Moger (2000) benign structures are presented in seven factors introduced by a skilled leader that establish, enhance cooperation, mutuality and consequently the performance of creative teams these are:

Factor 1: Platform of understanding (POU).

The creative leader explains that at the beginning of any creative endeavour, a team benefits from the exploration of shared knowledge, beliefs and assumptions. These elements comprise a "platform of understanding" from which new ideas develop.

Factor 2: Shared vision (SV).

At the POU stage, the platform of understanding is examined by the team to suggest perspectives. The dominant perspective is equivalent to a shared vision. The default view is limited mainly by habits and assumptions.

Factor 3: Climate (CLI).

The team leader emphasises the importance of a positive climate.

Factor 4: Resilience

The team leader emphasizes the principle of seeking alternative perspectives when dealing with frustrated expectations.

Factor 5: Idea owners (IO).

Efforts are made to build commitment to ideas. The team leader encourages deliberations designed to align ideas within regions over which team members have know-how and control.

Factor 6: Network Activators (NA).

This factor was derived after we interviewed a sample of participants who were successful executives outside the creative problem. solving exercises. The term was suggested by one interviewee, capturing the skills he considered important in his role of capturing and importing knowledge through external networks.

Factor 7: Learning from experience (LFE).

Creative leadership interventions were explained as a means of achieving experiential learning.

The concept of benign structures presents gaps specifically in as much as the field of its application is concerned. The concept gap concerning benign structures presented by the authors is answered by Carvalhal & Muzzio (2015) who analyse creative economy and creative leadership using the seven factors of benign structures whereby they aligned each factor to the creative leadership proposition by means of interviews with leaders per each factor.

The study on benign structure triggers to the other type of analysis, the authors worked with teams who received creativity training and some of these teams mentioned the difficulties of solving team problems which are helped if a conscious effort is made to address roles and responsibilities, also the study was done with leaders who had the responsibility of applying the principles (Rickards & Moger,1999)

In 2001 benign structures were associated with measurable factors used as Team Factors Inventory TFI instrument.

2.9.3 Team Factors Inventory (TFI)

The authors developed a questionnaire from the seven factors of the Creative Leadership Model. Each of the factors corresponds to three self-assessment questions, questions asked on a Likert scale, correspond the main inventory and the other items are optional to answer specific investigations, other items are for transformational leadership, transactional, creative production and creativity. (Rickards, Chen, & Moger, 2001).

According to Gallon and Ensslin (2008). It is found that the seven factors are covered with three questions each, resulting in 21 questions. In addition, five more variables were introduced, including aspects of leadership style and outcome. The added variables contain three items each, being three outcome criteria - productivity, creativity and knowledge management - and one leadership style criterion - transformational.

This model was first used in Portugal in an exploratory study to analyse the internal and external factors capable of influencing leadership in Portuguese biotechnology enterprise a study done by Landuyt (2011) many of them with the leaders, which leads to associate each factor and its sentence affirmative approach.

2.9.4 Implications of the factors of the Creative Leadership Model on creative teams

The increase of interactions in creative teams begins to have new implications after overcoming the first barrier considered by Rickard and Moger (2000) weak, also known as the behavioural barrier, the same authors consider that creative leadership is suggested as an important means of breaking the barriers, essentially, creative leadership requires the ability to value diverse perspectives and ways of thinking, as well as a keen sense of self-awareness to find and implement solutions to problems MacBean (2014) Mainemelis et al. (2015) present three implications of creative leadership, it is important to mention the second one which presents

the creative leader as the main source of creative thinking and behaviour, as a creative institutional entrepreneur or as a master creator who creates and manages his creativity.

Table 2- Results and conclusions

Key concepts	**Authors and years**	**Search base**	**Results**
Main barriers to performance	Rickards e Moger (2000, p.275) Chen, MH, & Agrawal, S. (2017)	Article Article	Study of two barriers to team development, the behavioural barrier and the performance barrier, with the communication barrier in mind.
Benign Structures	(Rickards e Moger 2000) Para Chen (2001) Muzzio & Júnior (2018) Sternberg et al. (2004) Carvalhal & Muzzio (2015) Rickards & Moger,1999	Articles and Conferences	When skilled leaders introduce seven factors that establish, enhance cooperation, mutuality, consequently activate the performance of creative teams.
Team Factors Inventory (TFI)	(Rickards, Chen, & Moger, 2001). Gallon e Ensslin (2008). Landuyt (2011)	Articles	Questions were asked on a Likert scale, which correspond the main inventory and the other items were optional to answer specific investigations, other items were for transformational leadership, transactional, creative production and creativity as results emerged three criteria - productivity, creativity and knowledge management - and a criterion of leadership style - transformational.
Creative and innovation processes	(Zhang, Zhang , & Song, 2015) Zhang et.al(2019) Desouza et al. (2009)	Articles and conferences	It is recommended that in the idea generation phase of the creative process, team members need to generate as many ideas as possible for creative tasks. Individuals with high openness to experience tend to assume dominant roles at this stage due to their abundant reserves of knowledge and more divergent thinking.
Development of creative teams	Rickard e Moger (2000) MacBean (2014) Mainemelis et al. (2015)	Articles	Developing creative teams involves creative leadership that requires the ability to value diverse perspectives and ways of thinking, as well as a keen sense of self-awareness to find and implement solutions to problems

Main concepts Authors and years Research base Results Main barriers to performance Rickards and Moger (2000, p.275) Article Study of two barriers to team development, the behavioural and performance barrier being thought of as the communication barrier.

Chen, MH, & Agrawal, S. (2017) Article Benign Structures (Rickards and Moger 2000) For Chen (2001) Muzzio & Junior (2018) Sternberg et al. (2004) Carvalhal & Muzzio (2015) Rickards & Moger,1999 Articles and conferences When skilled leaders introduce seven factors that establish, enhance cooperation, mutuality, consequently activate the performance of creative teams.

Team Factors Inventory (TFI) (Rickards, Chen, & Moger, 2001). Gallon and Ensslin (2008). Landuyt (2011) Articles Questions were asked on a Likert scale, which corresponded the main inventory and the other items were optional to answer specific investigations, other items were for transformational leadership, transactional, creative production and creativity as results emerged three criteria - productivity, creativity and knowledge management - and a criterion of leadership style - transformational.

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Developing creative teams Rickard and Moger (2000) MacBean (2014) Mainemelis et al. (2015) Articles Developing creative teams involves creative leadership that requires the ability to value diverse perspectives and ways of thinking, as well as a keen sense of self-awareness to find and implement solutions to problems

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