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In search for the missing link: Studying the interrelationship between organizational learning and organizational culture change

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Abstract

Purpose: The interrelationship between organizational learning (OL) and organizational culture (OC) is often assumed at an abstract theoretical level, but there is yet no systematization of scholarly knowledge allowing to conceptualize and understand its precise nature. In this article, we therefore ask “How can we, based on the insights from the dispersed research studying OC and OL, conceptualize the interrelationship between the two concepts?” Our purpose is to create an overview on the past development path and the current status of research interrelating OL and OC, to use it as basis for the conceptualization of this interrelationship and to identify avenues for future research.

Design/methodology/approach: This article utilized a systematic literature review methodology by combining bibliometric and content analysis using relevant articles identified from the Scopus database. A two-stage literature review research approach was employed: (1) Bibliometric analysis was used to identify 416 relevant contributions and to present a comprehensive contextual picture of the interrelations between OL and OC research by analyzing the 162 most relevant articles. (2) A subsequent qualitative content analysis of the 45 most relevant academic contributions detailed and solidified the insights.

Findings: We identify four weakly linked thematic clusters on the interrelationship of OC and OL. Based on that, our analysis confirms the theorized bidirectional relationship between OC and OL: OC acts as antecedent, driver and result of OL processes, and OL processes are constrained by and alter OC. We moreover develop three propositions that put knowledge at the center of scholarly attention for understanding this interrelationship in more depth and develop avenues for future research.

Practical implications: Our research has important implications for managers as it shows that mastering leadership challenges is central for the success of OL processes and OC change. We moreover specify the leadership challenges that relate to particular types of OL processes. Managers need to take this interrelationship into account when setting out for OL or OC change processes, and carefully reflect on whether or not the decided OL measures fit the given OC, and the other way round.

Originality/value – Our contribution to existing research is threefold: It first lies in analytically mapping out the research field, second in conceptualizing the interrelationship between OC and OL and third in identifying open research questions and topics.

Keywords: Organizational culture, Organizational learning, Bibliometric analysis, Qualitative literature review

Paper type: Research paper
1 Introduction

Organization study research acknowledges that the ability to learn is of utmost importance as it enables organizations to continuously react to changes in the environment that appear at an ever-increasing pace (e.g. Weick, 1991; Lemon and Sahota, 2004; O’Cass and Sok, 2014). Organizational learning is “commonly defined as processes of gaining new insights from experiences that consequently impact individual behaviors and organizational dynamics” (Do and Mai, 2020, p. 1202; based on Argyris and Schön, 1978; Fiol and Lyles, 1985; Huber, 1991). From their recent literature review, Flores et al. (2012, p. 661) find organizational learning (OL) as consisting of five distinct sub-processes, namely “information acquisition, distribution, interpretation, integration, and organizational memory.” The interest of the scientific community in antecedents of OL resulted in an impressive body of literature (Lyles and Easterby-Smith, 2003; Flores et al., 2012, Park and Kim, 2018; Do and Mai, 2020).

One of the primary determinants of OL identified in research is the organizational culture (OC) (e.g. Barney, 1986; Lundberg 1988; Kettinger and Grover 1995; Ahmed 1998; Aksoy, 2017; Michaelis et al., 2018; Becker, 2018; Ydaev et al., 2020). Like OL, OC is a multifaceted phenomenon that is conceptualized from a multitude of perspectives (e.g. Schein, 1984; Allaire and Firsirotu, 1984; Sackmann, 1992). At the most general level, OC can be understood as emergent dynamic and knowledge-based “organizational code” (March, 1991; p. 74) and as such as a “selection and interpretation filter” (Sackmann 1992, p. 170; see also Grant and Perren, 2002). OC consists of a “bundle’ of knowledge repositories with storing and information processing capabilities” (Lemon and Sahota, 2004, p. 483) which offers organizational actors a “vehicle of organizational meaning and sense-making [and] major guiding system” (Lundberg 1988, p. 46).
Both OL and OC are concepts that are well established, studied and theorized. At the same time, we find that the interrelationship between OC and OL is often assumed at an abstract theoretical level, but there is yet no systematization of scholarly knowledge allowing to conceptualize and understand its precise nature. In this paper, we carried out a systematic and comprehensive literature review through rigorous bibliometric analysis (e.g. co-word) to map the knowledge structure and themes and combined with a qualitative content analysis in a systematic literature review as research approach for investigating and structuring dispersed insights from different scholarly research to conceptualize this interrelationship. With this conceptualization, we contribute to extant literature an overview of scholarly work and an in-depth analysis on how, according to earlier research, the precise nature of the interrelationship between OL and OC can be theorized. We moreover identify shortcomings and open questions in extant literature and, based on them, propose avenues for future research.

The paper is structured as follows: Section 2 presents an overview on the literature and the research streams that discuss relationships between OC and OL. The research methodology, i.e. our approach of combining a bibliometric literature analysis with a qualitative content analysis in a literature review, is introduced in section 3. Section 4 presents the findings, and section 5 discusses them and conceptualizes the interrelationship between OL and OC. Section 6 develops future research directions from identified gaps, and section 7 concludes on contributions, implications for managers and limitations of this research.

2 Theoretical background: The interrelationship between organizational learning and organizational culture

The interrelationship between organizational learning and organizational culture is a well-theorized assumption. March (1991, p. 74) described OL as a process in which organizations socialize “recruits to the languages, beliefs and practices that compromise the organizational code”, while
simultaneously, “the organizational code is adapting to individual beliefs.” Building on this insight that cultural knowledge enables organizations to process organizational change, i.e. OL, and develop organizational stability, OC was found as “simultaneously constituting the basis for action and representing the product of action” (Wolf et al., 2012, p. 246), i.e. stabilizing organizations but at the same time being subject to changes caused by OL (Yadav et al., 2017). Hence, at a general and an abstract theoretical level, OC is assumed as being (re-)produced and changed through the enactment of cultural knowledge in OL processes. At this level, the conceptualized interrelationship is clearly bidirectional.

However, when seeking to learn about the exact nature of the bidirectional interrelationship between OL and OC, we face the challenge that this interrelationship was yet not conceptualized in more detail at an in-depth level. In scholarly literature, we find two dominant but dispersed research streams relating aspects of OL and OC to each other, yet both conceptualize a unidirectional instead of bidirectional relationship between them:

The first of these research streams builds on the seminal work of OL scholars such as Weick (1991), Argyris and Schón (1987), Fiol and Lynes (1985) and Huber (1991) and their understanding of OC as antecedent or contextual factor influencing an organizations’ OL capability. We find this stance reflected in recent literature reviews investigating the relationship between leadership and OL, in which scholars identify OC as mediating this relationship (e.g. Flores et al., 2012; Mueller, 2012; Eisend et al., 2016; Xie, 2019; Do and Mai, 2020). They highlight the importance of creating an OC that favors OL (e.g. Arz, 2017; Yadav et al., 2017; Cuffa and Steil, 2019; Garad and Gild, 2019; Lau et al., 2019; Shukla et al., 2020). Empirical studies identify and propose concrete leadership activities to establish such an OC, for example by carefully designing knowledge flows (de Castro Freitas et al., 2018; Obeso et al., 2020), learning from mistakes and feedback processes (Göktürk et al., 2017; Bligh et al., 2018), continuously encouraging knowledge sharing (Abbasi and Zamani-Miandasht,
2013; Imran et al., 2016; Malik and Garg, 2017; Shukla et al., 2020), preventing the suppression of voice of specific groups (Rao and Burde, 2017; Martin et al., 2018, Pope, 2019) or fostering teamwork and collaboration (Joo 2010; 2012; Nugroho, 2019). Further, Ozawa (2019) shows that the propensity of leaders to implement changes depends on his or her previous exposure to it, and their experience with such situations. Moreover, we find innovation management studies investigating the determinants of organizational innovation capability constituting a sub-stream of this specific research. Scholars argue that innovation processes are essentially OL processes, and find that amongst other factors, OC impacts the capability of organizations to generate innovative products and services (Tian et al., 2018; Ghasemzadeh et al., 2019; Mendoza-Silva, 2020; Montreuil et al., 2020). Empirical studies identify a mutual interplay between OC and other factors that enable OL, like for example between OC and the willingness to take risks and an orientation towards technological innovation (Herrmann et al., 2007), visionary leadership and HR policies (Liang et al., 2020) or open mindedness in OC and organizational memory (Kmieciak, 2019).

The second research stream is based on the scholarly discussion of the conceptualization of OC in the works of Schein (1984), Barney (1987), Dent (1991), Sackmann (1992), Geletkanycz (1997) and Hall (2001). In integrating the foundational scholarly work, it concludes that OL must be understood as the process that enables and shapes OC change (e.g. Dent, 1991; Lemon and Sahota, 2004; Kavanagh and Ashkanasy, 2006; Chaudhry et al., 2016; Gunsberg et al., 2018; Maes and van Hootegem, 2019; Norris and Ciesielska, 2019). Recent literature reviews and conceptual studies aim at increasing our understanding on the impact of different types of OL processes as moderators of OC change, such as design thinking (Elsbach and Stigliani, 2018), distributed imaging processes for change sensemaking (Peng, 2018), processes implementing contextual ambidexterity in organizations (Brix, 2019) or different types of strategy development processes in family firms (Tipu, 2018). Empirical studies show how the implementation of a leadership development program spurred OC change processes in
higher education institutions (Kellis and Ran, 2015; Barrett et al., 2019). Pina e Cunha et al. (2019) show paradoxical tensions and contradictions that can arise from change projects aimed at introducing an OC encouraging employees to speak up.

In summary, although theoretically assumed as bidirectional interrelationship, a deep understanding of the precise nature of the interrelationship between OL and OC is yet missing. We find that so far, research has produced two dispersed research streams that study either OC as mediator between leadership and OL, or OL as moderator of OC change processes, thereby assuming a unidirectional relationship between them. Figure 1 visualizes the above created overview of the research landscape.

*Figure 1: Overview on conceptualization of the interrelationship of OC and OL in recent scholarly research*

Our literature review suggests that because of these separate foci, in-depth research on the assumed bidirectional interrelationship of OC and OL remains rather embryonic so far. Although valuable for their respective research contexts, existing studies do not help us to precisely conceptualize and understand the precise nature of this interrelationship. Though, we assume here that greater attention to this interrelationship contributes to advancing organization studies altogether.

For the conceptualization of the interrelationship between OC and OL and the identification of future research avenues, we need in a first step a systematic in-depth overview of the insights in these two
research streams, that can provide a starting point for theorizing about this interrelationship. In this article, we therefore ask “How can we, based on the insights from the dispersed research studying OC and OL, conceptualize the interrelationship between the two concepts?” Our purpose is to create an overview on the past development path and the current status of research interrelating OL and OC, to use it as basis for the conceptualization of this interrelationship, and to identify avenues for future research. Our review is important because it synthesizes and structures the available scattered knowledge on OC and OL. Our contribution to existing research is threefold: It first lies in analytically mapping out the research field, second in conceptualizing the interrelationship between OC and OL, and third in identifying open research questions and topics.

3 Research methodology

Several methods like literature reviews based on qualitative content analysis, meta-analyses and bibliometric analyses have been developed and adapted by researchers to evaluate and map the knowledge created with regard to a given topic or research area (e.g. Singh et al., 2020, Gaviria-Marin et al., 2019). According to Callahan (2014), literature reviews generally provide systematic in-depth analysis and theoretical advancement of an area. However, several researchers like Caputo et al. (2018) and Verma and Gustafsson (2020) found the literature reviews process time-consuming, lacking rigor and prone to be affected by the researchers’ biases that lead to a limited analysis of research articles or the exclusion of important research. Further, according to Zupic and Cater (2015), meta-analysis is a powerful and rigorous method that quantitatively investigates and synthesizes the relationship between different researches. However, according to Caputo et al. (2018), the meta-analysis has a limited scope as it cannot be used to produce a comprehensive state-of-the-art overview of a given research area.
The bibliometric analysis explores the evolution path of the research field, while the literature review provides an overview of the current state of literature at a certain time. However, bibliometric methods provide a different perspective from meta-analyses and literature reviews applying qualitative content analysis only, by providing an overview about the connections among research articles and on the intersection of different research areas (similar to a literature review) without compromising on rigor or on the numbers of relationships investigated (Singh et al., 2020). Thus, the bibliometric literature analysis is a method that overcomes several of the limitations of the literature review and the meta-analysis. However, according to Verma and Gustafsson (2020), bibliometric studies are not a substitute for a literature review or meta-analysis, but can be used as a complement to traditional methods of literature investigation. Thus, in this study, we used for our literature review a bibliometric method to investigate the macro-picture, evolution and intersection of OL and OC literature, followed by a classical qualitative content-analysis-based literature review for a meso and micro investigation of the literature. More specifically, we used the bibliometric analysis to disclose statistical patterns and provide an informative overview of key topical perspectives on the interrelation between OL and OC within the field of organization studies, business, and management. In summary, we utilized systematic literature review method (Tranfield et al., 2003) by combining bibliometric analysis with content analysis to identify topical areas of OL and OC research and provide insights for future research interests.

Figure II depicts the research methodology of this study.

*Figure II: Research methodology for this study*
3.1 **Keyword search, articles screening and in- and exclusion criteria**

The quantitative approach of a bibliometric analysis was applied to capture the context of OL and OC in existing literature. The search process for the bibliometric analysis was conducted in November 2019, with a focus on publications in the field of organization studies, business, and management that were available in the Scopus database from the years 1984 to November of 2019. Similar to bibliometric approaches performed by other scholars (e.g. Singh et al., 2020; Verma, 2017), this study used a keyword search with the words “organizational learning” (learning or learning types or learning models or learning organization or organizational innovation or innovating organization or
innovation processes), “organizational culture” (company culture or firm culture or corporate culture) and the interrelation which we above assumed to appear as “organizational cultural change” (cultural change or culture change or organizational cultural change or corporate cultural change or learning culture or innovation culture or innovating culture or innovative culture). The data set focuses on articles published in journals only. Also, only contributions in English language were considered. A total of 162 items matched the criteria and were included in this examination.

In this study, we set a minimum number of citations to be 20 to include the article in our research. According to Jin et al. (2018), there is no standardized method to set up the threshold value for citations. However, several researchers like Hosseini et al. (2018) and Verma (2017) have used a threshold value of 20 minimum citations to identify the most valuable articles from a bibliometric analysis. A total of 45 out of 162 articles met the threshold of 20 minimum citations. We analyzed those further to get a clearer picture of the current research focusing OC and OL.

3.2 The bibliometric analysis

We used VOSViewer to identify the evolution of publications in OC and OL research over time, to detect the most productive journals in this field, and the corresponding keywords. The VOSViewer is a powerful network analysis tool that helps to visualize the dynamics and structures of research areas. In particular, VOSviewer is used for creating co-occurrence networks of keywords. A co-occurrence network of keywords indicates the proximity of two keywords by identifying the number of times keywords are used together in the research articles (Verma, 2017). According to van Eck and Waltman (2014), keywords reflect the main content of existing literature, and a network depicts intellectual relationship among research themes. Thus, we applied VOSViewer to construct the co-occurrence network of keyword to deeply explore and examine the intellectual structures of research on OL and OC (Van Eck and Waltman, 2014). The results of a keyword analysis provided by the bibliometric survey are based on quantitative properties mapping out the relations between variables.
Through this method overall statistical patterns become visible that help in better understanding the nature of a research field.

### 3.3 The qualitative literature content analysis

It can be difficult to derive qualitative conclusions from quantitative data, which is why in this study, we also conducted a qualitative literature analysis of the 45 most cited publications in OL and OC literature. Table I provides an overview on these papers.

**Table I: Top 45 research articles with minimum 20 citation in OL and OC research**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Year</th>
<th>Source title</th>
<th>Cited by</th>
<th>Score &lt;Norm. citations&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allaire Y., Firsirotu M.E., Dent J.F.</td>
<td>Theories of Organizational Culture</td>
<td>1984</td>
<td>Organization Studies</td>
<td>349</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Accounting and organizational cultures: A field study of the emergence of a new organizational reality</td>
<td>1991</td>
<td>Accounting, Organizations and Society</td>
<td>299</td>
<td>1</td>
</tr>
<tr>
<td>Linnenhuecke M.K., Griffiths A.</td>
<td>Corporate sustainability and organizational culture</td>
<td>2010</td>
<td>Journal of World Business</td>
<td>263</td>
<td>6.6723</td>
</tr>
<tr>
<td>Geletkanycz M.A.</td>
<td>The salience of ‘culture’s consequences’: The effects of cultural values on top executive commitment to the status quo</td>
<td>1997</td>
<td>Strategic Management Journal</td>
<td>240</td>
<td>4.1667</td>
</tr>
<tr>
<td></td>
<td>The impact of leadership and change management strategy on organizational culture and individual acceptance of change during a merger</td>
<td>2006</td>
<td>British Journal of Management</td>
<td>216</td>
<td>2.7566</td>
</tr>
<tr>
<td>Howard M., Nordqvist M.</td>
<td>Entrepreneurship as Radical Change in the Family Business: Exploring the Role of Cultural Patterns</td>
<td>2001</td>
<td>Family Business Review</td>
<td>184</td>
<td>4.6437</td>
</tr>
<tr>
<td>Lemon M., Sahota P.S.</td>
<td>Organizational culture as a knowledge repository for increased innovative capacity</td>
<td>2004</td>
<td>Technovation</td>
<td>132</td>
<td>1.9267</td>
</tr>
<tr>
<td>Govers C.P.M.</td>
<td>QFD not just a tool but a way of quality management</td>
<td>2001</td>
<td>International Journal of Production Economics Organization Science</td>
<td>93</td>
<td>1.1965</td>
</tr>
<tr>
<td>Howard-Grenville J.</td>
<td>Liminality as cultural process for cultural change</td>
<td>2011</td>
<td>Organization Science</td>
<td>78</td>
<td>3.5309</td>
</tr>
<tr>
<td>Authors</td>
<td>Title</td>
<td>Year</td>
<td>Journal</td>
<td>Volume</td>
<td>Impact Factor</td>
</tr>
<tr>
<td>---------</td>
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</table>
The objective of this second research phase was to allow for a rigorous assessment of the results from the bibliometric approach, ensuring that the identified themes of OL and OC found in the first research phase are in accordance with the main tenets presented in the literature.

Qualitative content literature analysis is influenced to a certain extent by the subjectivity of the author. However, the benefits of the qualitative method are indisputable and represent a well-established approach used in prior studies of similar kind (Pettigrew and Roberts, 2006; Callahan, 2014). To balance the risk of subjectivity in data analysis, we involved three researchers in it, thereby triangulating investigators (Denzin 1989; Flick, 2009). This study adopted Krippendorff’s (2013)
content analysis methodology to ensure a robust analysis. It allows for a comparison of past and present research activities to further understand the evolution of the field and helps to uncover the contextual dimensions of a research field, in our case the linkage between OL and OC.

4 Findings: Research on organizational learning and organizational culture

4.1. Descriptive analysis

Studying the publications which link OL and OC, figure I illustrates the evolution of journal publications available in the Scopus database on the topic of OL and OC. After the first article was published in 1984, the number of publications increased gradually, although there were not many publications on the topic until 2008. From this point onwards, the number of articles increased significantly. In 2011, for the very first time, more than 10 articles were published in one year. It can be assumed that this development will continue in coming years.

*Figure III: Evolution of scholarly literature linking organizational learning and organizational culture based on Scopus database*
We also analyzed which journals were the main outlets for the publication in the respective area. Table II provides an overview on the most influential journals publishing research that links OL and OC. More specifically, Table II provides a detailed quantitative analysis of the most relevant journals for our research in terms of number of articles published, citations, average citations and average norm. citations.

Table II: Most influential journals publishing OL and OC research

<table>
<thead>
<tr>
<th>Label</th>
<th>Documents</th>
<th>Citations</th>
<th>Avg. citations</th>
<th>Avg. Norm. citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal of Organizational Change Management</td>
<td>7</td>
<td>91</td>
<td>13</td>
<td>8,341</td>
</tr>
<tr>
<td>International Journal of Human Resource Management</td>
<td>4</td>
<td>54</td>
<td>13.5</td>
<td>9,339</td>
</tr>
<tr>
<td>Leadership and Organization Development Journal</td>
<td>4</td>
<td>21</td>
<td>5.25</td>
<td>2,971</td>
</tr>
<tr>
<td>Management Decision</td>
<td>4</td>
<td>88</td>
<td>22</td>
<td>6,939</td>
</tr>
<tr>
<td>Asia Pacific Business Review</td>
<td>3</td>
<td>56</td>
<td>18,6667</td>
<td>4,103</td>
</tr>
<tr>
<td>Health Care Management Review</td>
<td>3</td>
<td>266</td>
<td>88,6667</td>
<td>18,618</td>
</tr>
<tr>
<td>International Journal of Organizational Analysis</td>
<td>3</td>
<td>29</td>
<td>9,6667</td>
<td>17,369</td>
</tr>
<tr>
<td>International Journal of Technology Management</td>
<td>3</td>
<td>67</td>
<td>22,3333</td>
<td>0,989</td>
</tr>
<tr>
<td>Journal of Knowledge Management</td>
<td>3</td>
<td>145</td>
<td>48,3333</td>
<td>19,561</td>
</tr>
</tbody>
</table>

According to our analysis, the Journal of Organizational Change Management published the highest number of articles, but the Health Care Management Review is the most influential journal as it has the highest average citations (88,6667). The second most influential journal is the Journal of Knowledge Management, followed by the International Journal of Technology Management and Management Decision respectively. From this overview, it is obvious that the topic of the interrelationship between OL and OC was not yet intensively debated in the top journals of organization studies, although some seminal papers have been published there early and influenced the field to a great extent (e.g. Allaire and Fidirotu, 1984; Geletkanycz, 1997).
4.2. Connections of keywords on OL and OC research

We conducted a co-occurrence VOS analysis, reported in Figure IV, revealing 4 clusters of research linking OL and OC research:

*Figure IV. Co-occurrence of keywords in OL and OC research*

These results enabled us to discover the main themes in the literature linking OL and OC:

- The most dominant is the blue cluster (cluster 1). Scholarly work in this cluster focuses on challenges of leading organizational change processes (OL) with a focus on the impact of *organizational culture* (e.g. Nævestad, 2005; Hernández-Mogollon *et al.*, 2010; Cagliano *et al.*, 2011). The main keywords of this cluster are organizational change, leadership, organizational culture, organizational culture assessment, leadership theory, organizational innovation, problem solving, sustainable development, quality improvement, staff development, interdisciplinary communication, organizational performance, experimental learning.

- The second most dominant cluster is the red cluster (cluster 2). In this cluster, researchers study how *leadership*, in a collaborative manner, enable *OC change*. Articles discuss particularly by which approaches and means leaders can take OC values into account when aiming at
organizational change, to achieve a fit between OC and OL measures (e.g. Louise, 1996; Kavanagh and Ashkanasy, 2006; Landau, Drori and Terjesen, 2014). The main keywords of this cluster are change management, organizational learning, collaboration, learning techniques, process improvement, organizational learning culture, community of practice, value analysis, technology diffusion, needs assessment, organizational readiness, and diffusion enablers.

- The green cluster (cluster 3) is the next most dominant stream of research. In this cluster, scholars have given attention to OC change and organizational innovation resulting from OL processes. They focus on studying OL as process of incremental improvement implementation driven by problem-based learning and highlight the importance of avoiding dissonances with the OC. Empirical studies investigate how the introduction of technology or the use of knowledge management and quality improvement methods drive incremental OL processes (e.g. Al-Khalifa and Aspinwall, 2000; Lemon and Sahota, 2004; Al-Adaileh and Al-Atawi 2011). The main keywords of this cluster are learning and development, knowledge acquisition, continuous innovation, performance evaluation, decision making, cultural change, technological change, innovative capacity, interorganizational culture, leadership excellence, and managing diversity.

- Supporting the emergence of radical innovation with organizational cultures and structures based on dynamic capabilities are topics discussed in the yellow cluster (cluster 4). In this body of literature, resistance to change is a topic as well (Herrmann et al., 2007; McLaughlin et al., 2008). The main keywords of this cluster are innovation, resistance to change, product development, ambidexterity, business process reengineering, innovation culture, innovativeness, strategic planning, and dynamic capabilities.

The link strength (bold links) in the co-occurrence network shows the importance of the connection between the keywords according to the natural language processing within the literature. We identified strong links between clusters 1 and 2, i.e. between OC, organizational change and
leadership. All other clusters are rather weakly linked to each other. Most interesting to our research, we can see that the link between the mainly OC focused cluster 1 (blue) and the mainly OL focused cluster 3 (green) is rather weak.

We also investigated the growth in published journal articles from year to year. Figure V shows the average number of publications per year for literature on the interrelation on OC and OL.

*Figure V. Overlay visualization average publication per year occurrences in OL and OC - full keywords all fields.*

The increased size of cluster nodes and the increased number of connected clusters in green and yellow indicate an increasing trend from 2014 onwards. It shows that scholars are shifting from investigating the topic from the perspective of organizational change, decision making, OL and dynamic capabilities towards organizational innovation/innovativeness and organizational (learning) culture development. In figure V, nodes vary both in size reflecting the normalized citation and in color, with blue meaning older articles and yellow recent articles (Van Eck and Waltman, 2014). A closer inspection of the network suggests interrelated shifts of scholarly attention from leading OC
change (blue and red cluster in figure IV) to OC change through quality improvement and innovation as OL processes (green and yellow cluster in figure IV). Yet, the interrelationship of OL and OC is less discussed in innovation management research than in research on OC and organizational change. The investigation of our topic in innovation management research seems only to grow slowly, by a limited number of publications per year.

4.3. Qualitative content analysis

The four categories identified in the first research phase by VOSViewer were then subjected to a rigorous content analysis to validate the clusters as described in section 4.2. The top 45 articles in OL and OC literature (Table II) were classified along the lines of research design and methodological discussions about OL and OC. The OL and OC literature was therefore clustered, after extensive discussion within the research team, into four main themes. These main themes correspond to those identified with the bibliometric analysis, thereby confirming and validating the earlier findings with this second approach. The content analysis however provided us with additional in-depth information concerning the topic areas. These are presented below.

4.3.1 Blue cluster (cluster 1): Organizational culture

We classified 16 articles of our list of 45 most cited journal papers as belonging to the blue cluster (cluster 1) which focusses on the topic of “organizational culture”. Like in the bibliometric analysis, this cluster comprises the highest number of papers. In their seminal paper, Allaire and Firsiriotu (1984) lay the foundations for this clusters’ research stream by reviewing theoretical perspectives from the field of cultural anthropology and relating them to organizational culture. They develop a theoretical framework of organizational culture which they propose for studying incremental and radical change processes in organizations. Brannen and Salk (2000) add to this by characterizing the formation of organizational culture as complex negotiation process.
As found already from the bibliometric review, scholars in this research stream understand organizations as complex systems and cultural change as antecedent to and driver of organizational learning. Several scholars in this research stream conceptualize organizational culture as antecedent to organizational change: Flores et al. (2012) and Hernandez et al. (2013) find that the different subprocesses of organizational learning they identify have a significant relationship with organizational culture. Lukas et al. (2007) conclude from their longitudinal study of organizational transformation in 12 hospitals that informal cultural values and norms entrenched in the organization constitute the basis for and are affected by the transformation. Linnenluecke and Griffiths (2010) arrive at similar conclusions from their examination of the possibility of organizations to become more sustainable by changing towards more sustainability-oriented organizational (sub-)culture(s). Kondra and Hurst (2009) connect organization culture and institutional theory to re-think how structural and dynamic aspects of culture become nested, taken-for-granted and transmitted, and how organizational cultures cause both acquiescence and resistance to isomorphic pressures resulting in cultural persistence and/or change.

Several authors at conceptual level investigated the topic of the impact of cultural resonance and dissonance of the measures for organizational transformation. This research stream is somewhat inconclusive and ambiguous: Howard-Grenville et al. (2011) find organizational cultural change as best infused bottom-up in high resonance with everyday processes of organizational life. On the contrary, Canato et al. (2013) identify the implementation of culturally dissonant practices as an ongoing process that brings about a partial cultural change, the mutual adaptation of organizational practices and culture causing a general enrichment of the cultural repertoire of organization members. Other scholars highlight the importance of flexible redundant cultural frames for organizational transformation: Nævestad (2005) argues that cultural redundancy, i.e. the organizational promotion of dissonant cultural frames of reference that co-exist, is a necessary condition for organizational
learning. Keeping up practices that refer to different cultural reference frames is however contingent on a climate of trust and openness. Cho and Yoon (2001) find that dynamic collectivism allows for the development of Korean companies because it enables reactions to dynamic and conflicting features embedded in Korean corporate culture.

The like the bibliometric analysis, also the content analysis indicated that organizational culture constitutes challenges for leaders and decision makers in organizational transformation processes. The first group of challenges emerges from the need for the creation of an organizational culture-change embracing organizational environment: Hernández-Mogollon et al. (2010) show that if organizational culture is not open to enact new knowledge, this hinders the company's ability to innovate. Similarly, Lukas et al. (2007) identify the impetus to transform and leadership commitment to change as important for organizational culture transformation. For Mergers and Acquisitions, Bijlsma-Frankema (2001) underlines the role of trust with regard to a successful cultural merger, and findings by Schraeder and Self (2003) support the hypothesis that cultural differences impact the success rate of M&As and should therefore be taken into consideration early on. The second group of challenges arises out of the need for considering national cultural values that impact corporate culture as underlined in the work by Cho and Yoon (2001). Cagliano et al. (2011) show that national culture affects the likelihood to adopt new forms of work organization practices and needs thus to be considered by leaders aiming at implementing a change in organizational culture towards new work. Chen (2005) even seeks to develop an organizational learning system model that is applicable in both eastern and western business environments from comparing western and Chinese management systems with regards to cultural differences.
4.3.2 Red cluster (cluster 2): Organizational change and leadership

The red cluster (cluster 2) comprises 14 articles and is together with the green cluster the second biggest cluster in our content analysis. In this cluster, the relationship between organizational change and leadership is investigated.

The first important topic in this cluster is the link between national cultural leadership values and organizational change. Geletkanycz (1997) find a significant relationship between cultural values about leadership which top executives hold, their commitment to organizational change and the leadership styles they apply. Liu and Almor (2016) find leadership differences regarding how leaders from Western and Eastern cultures deal with change induced uncertainty and suggest that managers need to be aware of such cultural differences in global business development.

The second topic we find is the impact that organizational culture has on the decision-making behavior of managers when it comes to organizational change. Rodríguez (2005) shows that managers base their behavior predominantly on the company's culture and less on national cultures. Hall, Melin and Nordqvist (2001) find that different organizational cultural values impact decision makers’ attitude towards change in family firms. They argue that organizational cultural values and beliefs should constantly be made explicit and questioned to give space for organizational learning. At empirical level, Latta (2009) and Kavanagh and Ashkanasy (2006) find that an existing organizational culture shapes leadership change processes and hereby influences the success of change implementation. Dent (1991) and Busco and Scapens (2011) show that different organizational sub-cultures lead to the application of varying accounting practices.

As we already found from the bibliometric analysis, a further stream of research focuses OC aspects that determine the commitment of organizational members to change, and that need to be considered by managers aiming at implementing and assessing the success of organizational change measures.
Watkins and Dirani (2013) underline that senior management has a large impact on cultural changes and therefore needs adequate tools to measure and monitor cultural changes and desired developments. Verhezen (2010) emphasizes the importance of an integrity-based culture to increase a company-wide moral belief and behavior and urges management to move, also in their change measurement approaches, beyond a compliance-oriented organizational culture. Su, Baird and Blair (2009) found outcome orientation and stability as the most important cultural factors affecting employee commitment to change. Gallear and Ghobadian (2004) thus propose total quality management as a potential application to shape cultural change for organizational learning. Louise (1996) encourages the application of soft employee-related measures such as employee satisfaction or commitment measures for monitoring or inducing cultural change. Landau, Drori and Terjesen (2014) show that organizational members build up and apply cultural narratives to define legitimacy during prolonged periods of change. Such narratives and their alteration throughout a change process can serve as measures because they indicate organizational culture change.

4.3.3 Green cluster (cluster 3): Organizational learning

In our sample of the 45 most cited papers, the green cluster (cluster 3) which focuses on OL is with 14 papers one of the two most dominant streams of research. In this cluster, scholars have given attention to incremental organizational change resulting from the use of OL approaches.

The first research stream in this cluster examines incremental organizational learning processes and the importance of avoiding dissonances with the organizational culture when implementing them. In our sample, examples include the implementation of information technology (Boynton and Milazzo, 1996), TQM systems (Al-khalifa and Aspinwall, 2000), software improvements (Müller et al., 2009), IT usage in new product development (NPD) processes (Kawakami et al., 2011) and lean processes (Pakdil and Leonard, 2015).
The second group of papers in this cluster focus on *knowledge management measures supporting organizational learning*, for example by improving knowledge transfer within and between project teams (e.g. Mueller 2012; 2014). Scholars find that the openness of OC has a strong impact on the efficiency of knowledge management practices (Lemon and Sahota, 2004) and the willingness of organizational actors to engage in knowledge exchange (Mason, 2003; Al-Adaileh and Al-Atawi, 2011).

The third group of papers discusses the need to adapt OL methods and tools to *national culture related features of organization cultures* to efficiently implement and use them. For example, Glisby and Holden (2003) question the assumption that the SECI model can be transferred globally. Govers (2001) sees organizational differences resulting from Western versus Eastern management approaches as a potentially disturbing factor for successful Quality Function Deployment implementations. Cramton and Hinds (2014) examine cultural differences of globally distributed software development project teams and identifies a lack of cultural adaptation of communication tools and problem-solving approaches. However, Magnier-Watanabe and Senoo (2010) find in a qualitative case study that corporate characteristics have a bigger impact on company decisions in the field of knowledge management than national culture.

**4.3.4 Yellow cluster (cluster 4): Dynamic capabilities and radical innovation**

The yellow cluster consists of only two articles in the sample of our 45 most cited articles for the content analysis. These articles use empirical data to discuss how organization can create and use *dynamic capabilities for an organizational culture favoring radical innovation*. Herrmann *et al.* (2007) use a quantitative empirical study to research organizational and cultural characteristics necessary for organizations to develop the capabilities required for radical product innovations. McLaughlin *et al.*, (2008) identify, from a case study in a manufacturing company, 16 recommended management activities for fostering a radical innovation culture.
5 Analysis: Conceptualizing the interrelationship between OC and OL

When comparing the findings from the bibliometric and the qualitative content analysis of our literature review, we find that the content analysis confirms the topical clusters identified based on the bibliometric analysis both concerning the overarching cluster themes and the share of scholarly work dedicated to them. Yet, we also find that the two articles from the yellow cluster can be well integrated into the blue cluster: Herrmann et al. (2007) contribute with their study to the discussions about the resonance between OC and achievable OL effects, whereas the study by McLaughlin et al., (2008) adds to the debate about how leadership can create an OC change embracing organizational environment. We therefore decided to dissolve the yellow cluster and move the two articles into the blue cluster.

Moreover, the qualitative content analysis allows for an in-depth description of the cluster themes by providing us with detailed insights into the topics discussed in each cluster. It thereby solidifies research theme development. Table III provides an overview on the identified cluster themes and the topics discussed within the clusters.

Table III: Cluster themes and topics overview

<table>
<thead>
<tr>
<th>Cluster theme</th>
<th>Sub-themes</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cultural change as antecedent to and driver of organizational learning</td>
<td>Lukas et al. (2007), Kondra and Hurst (2009), Linnenluecke and Griffiths (2010), Flores et al. (2012), Hernandez et al. (2013)</td>
</tr>
<tr>
<td></td>
<td>OC caused challenges for leaders and decision makers in organizational transformation processes</td>
<td>Bijlsma-Frankema (2001), Schraeder and Self (2003), Lukas et al. (2007), Hernández-Mogollon et al. (2010); McLaughlin et al. (2008)</td>
</tr>
<tr>
<td></td>
<td>• creation of an OC change embracing organizational environment</td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
Organizational change and leadership (red cluster)
- considering national cultural values that impact corporate culture
  Cho and Yoon (2001), Chen (2005), Cagliano et al. (2011)
- Cultural leadership values and organizational change
  Geletkanycz (1997); Liu and Almor (2016)
- Impact of OC on decision making behaviour
  Dent (1991), Hall et al. (2001), Rodríguez (2005), Kavanagh and Ashkansy (2006), Latta (2009), Busco and Scapens (2011)
- OC aspects impacting implementation and assessing the success of organizational change measures
- Organizational learning (green cluster)
- Incremental organizational learning processes
- Knowledge management measures for OL
- Need to adapt OL measures to national culture related features of organization cultures
  Govers (2001), Glisby and Holden (2003), Magnier-Watanabe and Senoo (2010), Cramton and Hinds (2014)

5.1 Bidirectional interrelationship between OC and OL

The bibliometric analysis shows that the density of the links between the topical clusters, and particularly between the cluster focused mainly on OC (blue cluster) and the cluster mainly focused on OL (green cluster), is relatively weak. Still, the qualitative content analysis allows to interlink scholarly work from the dispersed clusters. Through this, we can confirm research that has theorized a bidirectional interrelationship between OC and OL (e.g. March, 1991; Wolf et al., 2012; Yadav et al., 2017).

We find that OL appears in different forms in the clusters: as organizational change or organizational transformation (blue and red cluster), as incremental change of organizational processes (green cluster), or as radical product or service innovation (yellow cluster). All OL processes described in the scholarly work however have in common that they happen within an organization with a specific OC. Depending on the focus of their studies, scholars argue either that OC impacts OL because it acts as antecedent and is a driver for OL (blue cluster). Or they find that OC alters due to OL (red cluster).

With the above conceptualization, our analysis thus confirms the theorized bidirectional interrelationship between OC and OL: OC acts as antecedent, driver and result of OL processes, and OL processes are constrained by and alter OC.
5.2 Propositions about the interrelationship between OL and OC

From our analyses, we can draw three major propositions about the interrelationship between OL and OC that advance the outlined recent state of research.

First, earlier research finds OC being formed in complex negotiation processes of the relevance of new knowledge to the organization (Brannen and Salk, 2000), and that any change in OC is the result of OL (Flores et al., 2012; Hernandez et al., 2013). Scholars highlight that OL implies an enrichment of the repertoire of culturally accepted practices that the members of an organization can use (Bijlsma-Frankema, 2001; Nævestad, 2005; Canato et al., 2013). They also show empirically that the enactment of culturally resonating new knowledge leads to incremental OL and OC change (Hernández-Mogollon et al., 2010; Howard-Grenville et al., 2011), while the enactment of dissonating new knowledge can lead to radical OL and OC change, because it significantly enriches the OC practice repertory (McLaughlin et al., 2008; Canato et al., 2013). From analyzing this body of research, we identify OL as a process that genuinely happens through the enactment of new knowledge as part of the ongoing OC formation. The degree of novelty of the knowledge that an organization can enact seems to impact the radicality of OL, and OC change. We therefore propose:

*Proposition 1: The degree of novelty of the knowledge that OCs can enact predetermines the radicality of OL, and subsequently the richness of applicable organizational practices that fit the OC.*

Second and related, scholars underline that organizational members try to make sense of discrepancies between old and new practices during OC change, and that it is a leadership task to support them with adequate measures to do so (Verhezen, 2010; Watkins and Dirani, 2013). For example, prolonged exposure to and usage of new tools changes, even if there is a dissonance with OC, cultural beliefs and increases their retention (Canato et al., 2013). Likewise, discourses about the improvements gained by investment in technology are important for learning new practices despite
of conflicts with the existing OC (Müller, et al., 2009; Kawakami et al., 2011; Cramton and Hinds, 2014). From analyzing this body of literature, we conclude that managing cultural dissonance is a way for leaders to diminish resistance, because it ensures the sense-making about new knowledge in the light of the in the recent in OC incorporated knowledge. Thus, we propose:

**Proposition 2:** To lead OL for OC change successfully, leaders need to proactively engage in dissonance management to ensure that new practices and tools that are introduced during OL processes can be made sense of from the current OC perspective.

Third, many researchers suggested that the leadership style is influenced by the prevalent organizational, social and national culture (e.g., Geletkanycz, 1997; Latta, 2009; Kavanagh and Ashkanasy, 2006; Liu and Almor, 2016). This embeddedness in multiple cultural values plays an important role in shaping leader´s views on appropriate organizational responses to environmental change, relationships with employees, and strategy implementation practices (e.g. Rodríguez, 2005; Busco and Scapens, 2011). Researchers proposed reflection before and on action as an approach for increasing the consciousness of cultural effects in OL-related leadership choices (Argyris and Schön, 1987). As reflection before action is always prospective, while reflection on action is always retrospective, we propose to add practices stimulating immediate reflection while acting, i.e. reflection in action, that was found as critical for accessing truly new knowledge for visionary leadership and organizational change (Scharmer, 2001; Bokeno, 2003; Wolf et al., 2011). Our proposition reads as follows:

**Proposition 3:** To allow for conscious leadership choices during OL and OC change despite of effects caused by cultural embeddedness, leaders need to complement reflection on action with reflection in action.
All three propositions point to the crucial role that the handling of new knowledge plays in the interrelationship between OC and OL.

6 Discussion, contribution and avenues for future research

Our research advances the recent state of research in several ways. Below, we outline how, and point to open research questions and directions for future research.

6.1 The interrelationship between OL and OC in organization studies

One of the most surprising insights of our research is the weakness of the link between research studying OL and research investigating OC, that we made visible with the bibliometric analysis. We find a dearth of research that investigates OL and OC together: The bibliometric analysis shows that the topical areas (the four clusters) focus predominantly on either OC or OL. The content analysis confirms this finding by stressing that depending on the perspective, the respective other concept is treated either as an antecedent (like an open OC for OL) or as a consequence of the other (like OL as a result of OC change). From analyzing these dispersed scholarly perspectives together, we extent earlier scholarly work through confirming the bidirectional interrelationship between OC and OL, that was theorized on earlier (March, 1991; Wolf et al., 2012; Yadav, 2017). Further scholarly research is needed to study the variations in the OL and OC coupling in this bidirectional interrelationship.

6.2 Handling knowledge in OL and OC

All three propositions point to the important role that handling of new knowledge plays in the interrelationship between OC and OL. This reflects the findings from two streams of earlier research: One of them conceptualizes OC as being essentially knowledge-based (e.g., March, 1991; Sackmann 1992; Grant and Perren, 2002; Wolf et al., 2012), and the other one identifies knowledge management
measures as supporting OL (e.g., Mason, 2003; Lemon and Sahota, 2004; Al-Adaileh and Al-Atawi, 2011). Our study relates these streams to each other, and thereby complements earlier research. Yet, from our research, we cannot clearly conclude how handling knowledge impacts this interrelationship (mediating or moderating effects), and suggest this to follow-up studies. This would also support to refine the understanding of the interrelationship between absorptive capacity, OC as firm-based factor and OL further, as called for by Sun and Andersen (2010) more than ten years ago.

Our first proposition points to an amplification relationship between the openness of OC to enact new knowledge, and the radicality of OC change achievable through OL. It proposes, that the more/less open the OC to enact dissonant knowledge, the more/less radical the OC change achievable through OL, and the more/less enriched the organizational practices that fit OC will be. To operationalize and test this proposition is important for our understanding on how we can support OL in processes that require strong OC changes, such as mergers and acquisitions (Bijlsma-Frankema, 2001; Schraeder and Self, 2003).

Our third proposition (re-)draws scholarly attention on the importance of enacting self-transcending knowledge from an incipient space during OC change (Scharmer, 2001; Bokeno, 2003). It points to the importance of conceptualizing OL not “just” as process in which management implements OL measures and converts tacit-embodied into explicit knowledge to reflect on culturally induced perspective biases (Hall et al., 2001). Instead, OL needs to be understood as transformation process in which leaders create new OC while leading OL, what necessitates (complementary) reflection in action (Scharmer, 2001). Future research is invited to explore this proposition in empirical studies, and to conceptualize practices for leaders to integrate reflection in action in OL approaches.
6.3 Identified inconclusiveness in earlier research

We contribute to the scholarly debate by identifying two topics on which research is inconclusive and presents contradictory conclusions. The first one is the inconclusiveness about whether resonance (e.g. Howard-Grenville et al., 2011) or dissonance (Nævestad, 2005; Canato, et al., 2013) of OL processes and measures with a given OC will eschew a better capability in accommodating change. Our first and second proposition together offer a starting point to approach this long-standing and apparently entrenched debate, as they suggest to refocus the question and to instead conceptualize a dissonance management that enables to create a fit of OL measures with the radicality of the desired OC change. We call for further research theorizing an OL dissonance management framework applicable for OC change, and exploring it empirically.

Another topic with yet inconclusive research that we identify is the impact of national culture on OC, and consequently on OL. Several scholars argue that national culture impacts OC, and thereby OL, through the mental models of leaders (Geletkanycz, 1997; Liu and Almor, 2016) or of the staff in general (e.g. Chen, 2005; Cagliano et al., 2011). Other scholars disagree and propose that OC is more influential than national culture for OL (e.g. Magnier-Watanabe and Senoo, 2010). Solving this inconclusiveness requires further research.

6.4 Open research questions emerging from methodological issues

We identify further research needs that emerge from methodological issues. Two thirds of the 45 top cited research articles in the field are empirical studies, and additional 13 use data from a literature review. Figure VI visualizes the distribution of research methods in this sample.

Figure VI. Distribution of research methods in article sample (45 top cited articles)
Although OL and OC change are known as slow and long-term processes (e.g. Allaire and Firsirotu, 1984; Sackmann, 1992), we find only few studies using longitudinal qualitative methods. We thus propose that longitudinal studies focusing on the interrelationship between OL and OC present an opportunity for scholars.

We further find that OL and OC empirical research focuses mostly on multiple-industry and manufacturing sector organizations, as shown in Figure VII.

**Figure VII: Distribution of empirical research across industries (45 top cited articles)**
This distribution raises the question whether we can generalize our findings beyond these two industries. We therefore call for studies that allow for comparing insights across industry sectors. The third methodological issue we identify is a dominance of empirical papers from the United States and the United Kingdom, as figure VIII presents.

*Figure VIII: Distribution of empirical research across countries (45 top cited articles)*

This again raises the question of generalizability of the findings in the research field, for example for European and Asian countries, and calls for studies collecting data from organizations from these countries.

7 Conclusion

This article contributes to extant research by systematically reviewing literature on the interrelation between OL and OC. It thereby aims at investigating the proposed interrelationship between the two concepts (e.g., Barney, 1986; Lundberg 1988; Kettinger and Grover 1995; Ahmed 1998; Aksoy, 2017; Michaelis et al., 2018). It uses a combined bibliometric and qualitative content literature analysis to identify authors who have significantly contributed to this area, the most prominent articles and the topical clusters including the timeline along which the scientific discourse in organization studies evolved.

The outcomes of this two-step analysis offer deep insights into contemporary discussions, advancing the research field focusing on the interrelationship between OC and OL. We find that the link between the two concepts was so far assumed but not conceptualized and discussed at theoretical level with
the necessary depth. Based on the systematic overview of extant literature, we propose a bidirectional generic conceptualization of this interrelationship and develop three propositions that put knowledge at the center of scholarly attention for understanding it in more depth. Moreover, we identify areas for future research that will advance the understanding of the field. Methodologically, this literature review demonstrated a way to effectively combine a bibliometric analysis with qualitative content analysis for revealing intersections between two research areas.

7.1 Implications for managers

Our research has important implications for managers as it indicates that mastering knowledge-related leadership challenges is central for the success of OL processes and OC change. It clearly shows that the interrelationship between OL and OC is bidirectional. This requires that managers take this interrelationship into account when setting out for OL or OC change processes, and highlights the need for carefully reflecting on whether or not the designed OL measures fit the given OC, and the other way round.

In particular, organizational change or organizational transformation require leaders to pay special attention to creating a change-embracing environment that is open to the adaption of new knowledge in the desired OC change radicality and to managing the dissonance or resonance of OL with cultural reference frames. They are further advised to develop routines for engaging in reflection in action, complementary to reflection before and on action.

7.2 Limitations

This study considered 45 most cited research articles with minimum 20 citations, thus the present two-phased methodological approach has a specific scope. An extension of this study would be to enhance the scope of the dataset and analysis. For example, including less cited or newly published articles, or articles published in book chapters, conferences, notes etc. can lead to a broader basis for
literature evaluation. Further, this study used the co-word analysis technique - future research could conduct co-citation and/or bibliographic coupling analyses on authors, institutions, countries, references etc. to complement this research. Limitations also relate to the fact that we included only articles from the Scopus database into this review so far. Thus, future research can consider articles published in other databases like EBSCO, Web of Science, or Google Scholar.

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