

Review

Knowledge Sharing in Business Education

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Abstract: The paper aims to investigate the evolution of the theme of knowledge sharing in business education in academic literature. Based on an extensive search, it can be stated that this is the first systematic review of this topic. The method employed in this study was a systematic review that covered publications from 1997, when the first paper relating the theme was published in the selected databases, to 2020. The analysis was based on 306 articles. Four periods were identified: embryonic, emergent, growth young and growth highest. One of the findings is that knowledge sharing in business education is growing in virtual environments, especially in the last year, where the COVID 19 pandemic restricted the option of face-to-face education in classrooms. It is recommended that business schools decrease the percentage of time they spend in lectures and increase the time and strategies in which students share knowledge, discuss problems and make decisions based on collective reflection.

Keywords: knowledge sharing; knowledge management; business education



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1. Introduction

Knowledge sharing is a process of knowledge management fundamental in the context of business education [1]. Knowledge management impacts business education through the mediation of the academic curriculum and the influence of the business environment [2]. Knowledge sharing is essential in the development of skills used in organizational environments—for example, teamwork [3], leadership [4], culture management [5], human resources practices [6], and sustainable innovation [7,8]. Knowledge sharing is also essential in the development of competences for business education. Some of the most relevant skills in business education that can be developed through knowledge sharing are problem-solving, creative thinking, teamwork, decision making, communication, negotiation, critical thinking, leadership, and creativity.

Knowledge sharing is defined as the process where individuals mutually exchange their tacit and explicit knowledge and jointly create new knowledge [9]. It is also the ability to transfer framed experiences, information, and expert insights into practices [10]. Knowledge sharing is the interaction between human actors where the raw material is knowledge [11]. This behavior is the act of making self-knowledge available to others. Knowledge sharing is critical for the creation and application of knowledge and solving complex problems. Sometimes, knowledge sharing and knowledge transfer are used as interchangeable terms [12]. However, Chou and Tang [13] found that knowledge transfer emerged earlier and has a more general scope that covers multidisciplinary subjects, while knowledge sharing is more focused on the knowledge management context.

A blocker of knowledge sharing is knowledge hoarding, which is defined as an individual's deliberate and strategic concealment of knowledge [14]. This occurs when a worker purposely keeps critical knowledge to him. According to Bilginoğlu [15], the knowledge hoarder fears that the more he shares, the more he gives power away. Hoarding knowledge is a common inclination of employees in organizations where competition is

promoted [16]. It also happens when an employee perceives significant time pressure [17]. Knowledge hoarding is related to knowledge donation because when people hoard some unrequested knowledge, they avoid sharing what somebody else could take advantage of [18]. This behavior weakens performance at an interpersonal level [14].

In the context of education, knowledge sharing is the cornerstone of collaborative learning. According to Prince [19], knowledge exchange improves academic achievement, the quality of interpersonal interactions, and attitudes to work with others. Knowledge sharing should be part of the discourse within the business school community of higher education [20]. Bratianu et al. [21] propose that the volatile, uncertain, complex and ambiguous business environmental compel a paradigm that shifts from knowledge transfer to business competence development. According to the authors, the objective of business education should be to prepare the actual students for future jobs and professional achievements.

There are recent studies that report the role of knowledge sharing in business education and its relevance in organizational contexts [22]. How to work collaboratively in groups is more important than ever because the amount of teamwork expected from employees and managers has increased in recent years [23]. A fundamental process in group work is knowledge sharing. Additionally, typical challenges with interdisciplinary projects are communication issues and knowledge sharing workloads [24].

Knowledge sharing is increasingly common in virtual environments. Online education research has studied the role of cooperative learning through discussion [25]. In this direction, it was found that incorporating a discussion forum on Facebook enhanced student economic exam scores [26]; additionally, Padlet, an interactive virtual wall, was an effective tool to share knowledge online in a finance course [27]. There is also evidence that knowledge sharing improves peer assessment [28].

Not all tools that involve knowledge sharing have been evaluated as irrefutably effective. Many studies show that the case method can develop collaborative skills in students [29]; however, another study found no significant correlation between text-based discussion forums and grades [30]. There is also evidence that the case method, an interactive tool, is as effective as the lecture method in respect of learning outcomes [31]. Coceiru, Katz and McDonald [32] explored management students' interactions, comparing traditional classes and classrooms that they called organizations, where students worked in groups to create and manage an organization. Results indicated that the classroom as an organization involved students in a better cohesive network of interactions compared to traditional classes.

Business and nonbusiness students' attitudes were compared regarding classroom knowledge sharing [33]. It was found that business students wanted more freedom over group functions and were more concerned with the equitable distribution of work.

Business classes frequently use designs that do not promote student interaction [34]. Some blockers of knowledge sharing in business education are teacher-centered habits, learners' lack of openness and reciprocity, and competing priorities of students [35]. The constructivist theory of learning states that peer interaction is crucial in student development [36,37]. Peer learning provides a positive impact on overall learning [38]. Knowledge exchange and active participation promote academic achievement [39].

The literature focusing on the influence of knowledge management on business education is scarce [2]. After extensive research on the subject, it can be stated that this is the first systematic review about the topic of knowledge sharing in business education. Twenty-three years have passed since the publication of the first article on this area in the Scopus and Web of Science databases and it is pertinent to evaluate how the subject has evolved. The purpose of this paper is to present the evolution of knowledge sharing within the academic business education literature. The evolution is defined in terms of the number of publications by year, the most representative papers and authors by citations, the lifecycle stages and their characteristic topics, and the keywords map to visualize the most representative concepts.

There are related works such as bibliometric studies on knowledge management [40–43], bibliometric works on knowledge sharing [44], a review of knowledge sharing in education [45], and a review of knowledge sharing in higher education [46].

The next part of this article has the following structure: the method of the study, the results associated with the purpose of the research, the conclusions, and some practical implications from the results.

2. Methods

The method employed in this study was a systematic review, covering knowledge sharing in business education publications from 1997, when the first paper relating the topic was published in the selected databases, to 2020 (inclusive). The methodology proposed by Tranfield, Denyer, and Smart was followed [47]. The research protocol addressed the following question: how has literature on knowledge sharing in business schools evolved from 1997 to 2020?

The study used two databases to obtain the literature associated with the research question: the Web of Science Core Collection and Scopus. The search string for the Web of Science was:

(("business education" OR "business school" OR "master business administration" OR mba OR "business facult*") AND ("knowledge sharing" OR "knowledge exchange" OR "knowledge management" OR "knowledge transfer")).

The search string for Scopus was:

TITLE-ABS-KEY (("business education" OR "business school" OR "master business administration" OR mba) AND ("knowledge sharing" OR "knowledge exchange" OR "knowledge management" OR "knowledge transfer")).

To identify the evolution of the topic knowledge sharing in business schools, the lifecycle theory was applied [48], which claims that areas of knowledge develop according to an S-curve operationalized in four stages: emergent, growing, maturation, and saturation. Because the issue of knowledge sharing in business schools is not yet in maturation, this article defined the following stages: embryonic, emergent, growth young and growth highest. To identify the development of the relationship in time, the performance measures used were the number of articles and, to generate the S-curve, the accumulated number of articles.

A complementary analysis of lifecycle was implemented using the methodology developed by Moguee [49], which uses two performance indicators to define the stages of the evolution of a topic: the number of publications and the number of authors per year.

To identify seminal articles or those that can be considered foundational in the generation of the literature on knowledge sharing in business schools, two bibliometric indicators based on social network analysis were used: degree centrality, which indicates the number of times that a document was referenced by other documents in the analyzed network, and node-betweenness centrality, which indicates the capacity of nodes to connect different clusters and research areas [50].

In each stage, the most important articles were recognized using the methodology followed by Betancur, Villa-Espinal, Osorio-Gomez, Cuellar and Suarez [51]. In this methodology, to normalize and avoid discrimination by the age of the articles, the total forward citations were identified each year and compared with those of the articles analyzed for the total number of citations in the year of publication. Additionally, at each stage, trends were analyzed using unsupervised clustering methodologies, a machine learning approach that permits the identification of the main topics of each period [52–54]. Additionally, bibliometric techniques oriented to the recognition of publication frequency and based on pattern analysis were used.

Finally, an analysis of key terms was developed in which the core ones were identified by their H index. Emergent topics were those that had recently appeared for the first time in titles, abstracts, and keywords. Declining topics were also recognized—those that had not featured as much in the literature as in previous years. Growing topics were those that have

augmented in publications in recent years. Some techniques used in this research were KNIME for data mining, data cleaning and data filtering [52], Gephi for social network analysis [53], and Vosviewer for generating topic analysis for each stage [55].

3. Results

Below are presented several analyses, such as the number of publications in the field from 1997 to 2020, the main authors and articles, the lifecycles stages, and the keyword map.

3.1. Publications on Knowledge Sharing and Business Education

The first report is about the number of articles published on knowledge sharing in business education. The range of publication goes from 1997 to 2020 and is presented in Figure 1. Based on the traditional lifecycle methodology, articles per year were taken as a measure of growth. The figure shows the evolution in the development of the topic knowledge sharing in business education. In this sense, it was found that between 1997 and 2002, this field went through an initial phase of low scientific production and from 2003 to 2020, it has been in a growth phase characterized by a relevant production of knowledge, except in the years 2004, 2009 and 2015.

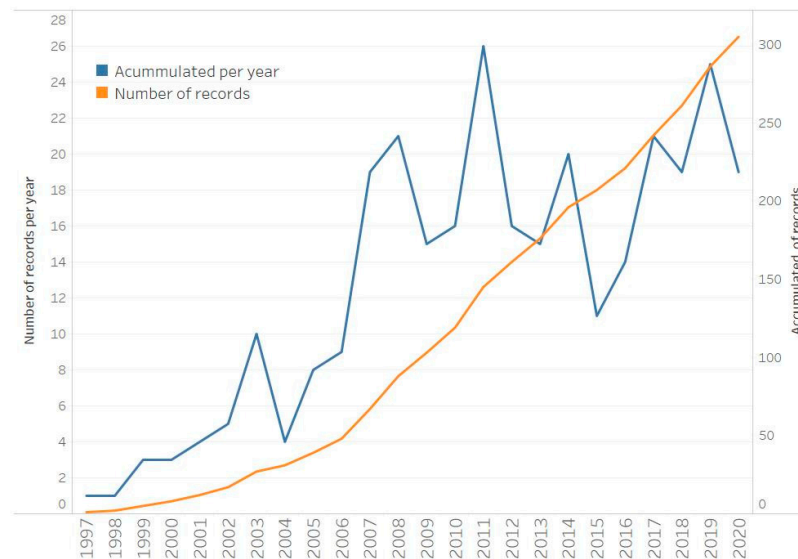


Figure 1. Growth in published articles of knowledge sharing in business education.

3.2. Main Articles and Authors

To recognize the articles that can be considered as building blocks and seminal in the field, and thus can identify the roots of knowledge sharing in business education, a network of backward citations was developed with the papers obtained by the search equation (Figure 2). The figure shows that certain articles are the theoretical bases of the field (A, D and C). Other relevant bridging papers are W, Y, R, X and \$.

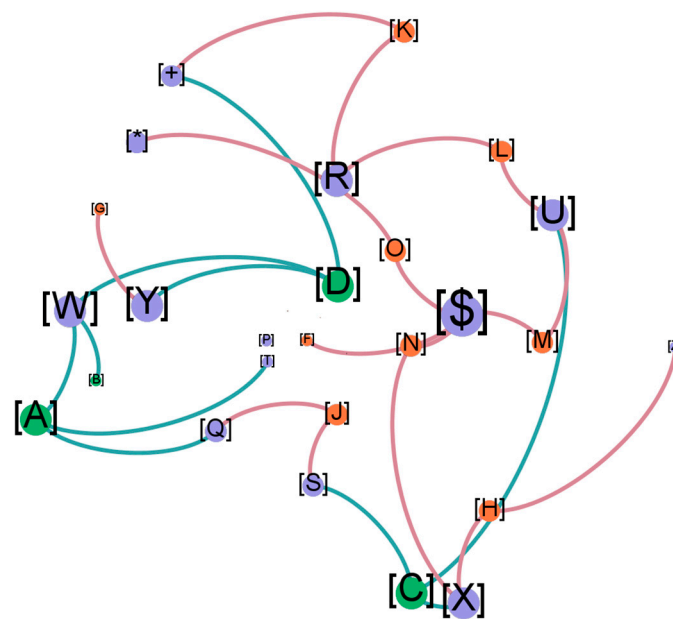


Figure 2. Main clusters of related papers.

From the total number of articles in this review, the most relevant ones were filtered by citations (Table 1). Some articles have a high number of citations and simultaneously fulfill the role of a bridge, such as A, B, C, and D.

Table 1. Most representative papers about knowledge sharing in business education.

Key Articles in the Network	Relevance in the Network	Label
[56]	[HIGHLYCITED] [BRIDGE]	[A]
[57]	[HIGHLYCITED] [BRIDGE]	[B]
[58]	[HIGHLYCITED] [BRIDGE]	[C]
[59]	[HIGHLYCITED] [BRIDGE]	[D]
[60]	[HIGHLYCITED]	[E]
[61]	[HIGHLYCITED]	[F]
[62]	[HIGHLYCITED]	[G]
[63]	[HIGHLYCITED]	[H]
[64]	[HIGHLYCITED]	[I]
[65]	[HIGHLYCITED]	[J]
[66]	[HIGHLYCITED]	[K]
[67]	[HIGHLYCITED]	[L]
[68]	[HIGHLYCITED]	[M]
[69]	[HIGHLYCITED]	[N]
[70]	[HIGHLYCITED]	[O]
[71]	[BRIDGE]	[P]
[72]	[BRIDGE]	[Q]
[73]	[BRIDGE]	[R]
[74]	[BRIDGE]	[S]
[75]	[BRIDGE]	[T]
[76]	[BRIDGE]	[U]
[77]	[BRIDGE]	[V]
[78]	[BRIDGE]	[W]
[79]	[BRIDGE]	[X]
[80]	[BRIDGE]	[Y]
[81]	[BRIDGE]	[Z]
[82]	[BRIDGE]	[*]

3.3. Lifecycle Stages

Table 2 presents the stages, years, mean of the number of records, and mean of the number of authors of research on knowledge sharing in business education. It was found that the study of the topic is currently in the highest stage of growth.

Table 2. Lifecycle stages.

STAGE	Years	Mean of Number of Records	Mean of Number of Authors	Number of Records
Embryonic	1997, 1998, 1999, 2000, 2001	4	3	13
Emergent	2002, 2003, 2004, 2005, 2006, 2015	19	17	47
Growth young	2007, 2009, 2010, 2012, 2013, 2016	19	35	95
Growth Highest	2008, 2011, 2014, 2017, 2018, 2019, 2020	26	52	151

The first stage, the embryonic, presented the beginning of the study of knowledge sharing in business education. This stage occurred between 1997 and 2001 (color blue in Figure 3). The average number of authors and articles shows the slow growth characteristic of this period. The second stage, emerging, began in 2002 and lasted until 2006 and returned in 2015 (color orange in Figure 3). The average number of publications in this phase was 19 per year and the average number of authors was 17, showing growth compared to the previous stage. In the following years, there were transitions in the stages of growth young and growth highest. The growth young stage occurred in 2007, 2009, 2010, 2012, 2013 and 2016, with an average of 19 articles and 35 authors per year (color green in Figure 3). The growth highest stage occurred in the years 2008, 2011, 2014, 2017, 2018, 2019 and 2020 (color red in Figure 3).

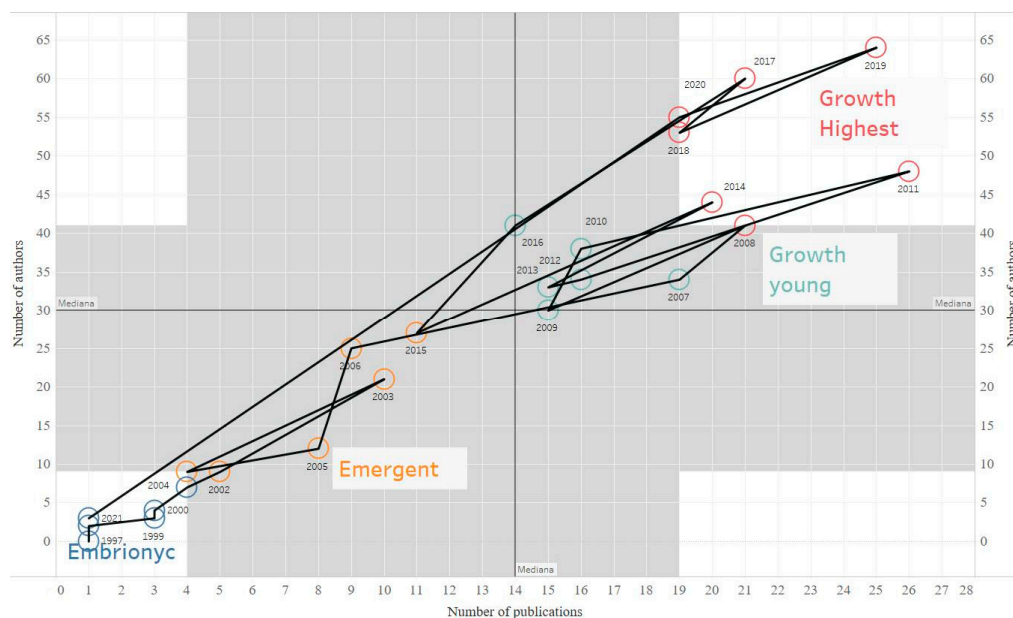


Figure 3. Lifecycle analysis using the number of publications and number of authors.

Figure 4 presents the most important authors in the four proposed stages using two bibliometric indicators—the number of publications (*X*-axis) and the accumulated citations (*Y*-axis). In the embryonic stage, the two authors with the highest number of accumulated citations were Birkinshaw [83] with the work entitled “why is knowledge management so

difficult?” and the one of Cheng [84]. In the emerging stage, the most cited authors were Wilson [85] with a critical article on knowledge management and Gray [86]. In the growth young stage, the most cited authors and works were Kanawattanachai [71], which is about the impact of knowledge coordination on virtual teams, and Bason [87], on public sector innovation. In this stage, Chen [73,86] stood out for the number of studies, especially the article about college students’ use of e-learning systems. In the highest stage of growth, the most cited authors were Hidalgo and Albors [88] about innovation techniques, and the author with the highest number of articles was Doctor [89–91], with works on users of knowledge repositories in a management institute, the dynamics of knowledge sharing in a management institute, and capturing intellectual capital in a business school institution.

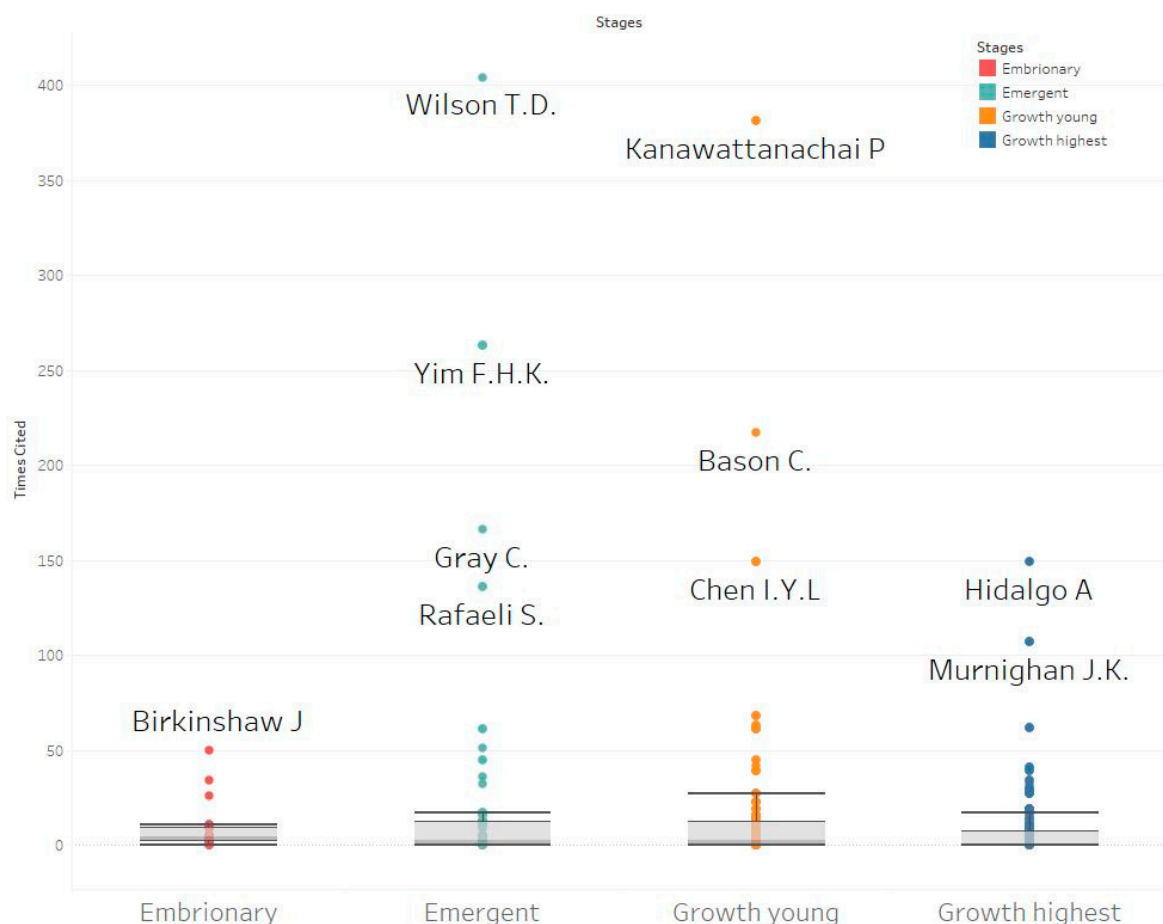


Figure 4. Key authors based on the number of publications and forward citations.

On the other hand, the different coauthorship networks were analyzed (Figure 5). This work was carried out in a transversal manner to observe the community that has been built on this topic, which cumulatively allows us to recognize authors who serve as bridges between communities and key authors due to their degree of collaboration. For this examination, the social network analysis and the indicators betweenness centrality and degree centrality were used as the methodology. This showed that the research on knowledge sharing in business education is a rising topic and that there is no large formal community. The most important network is made up of 13 authors; the second most important network is formed by eight authors. According to this analysis, the most relevant authors are Chen, C. [92], Bontis [93] and Levin [94,95].

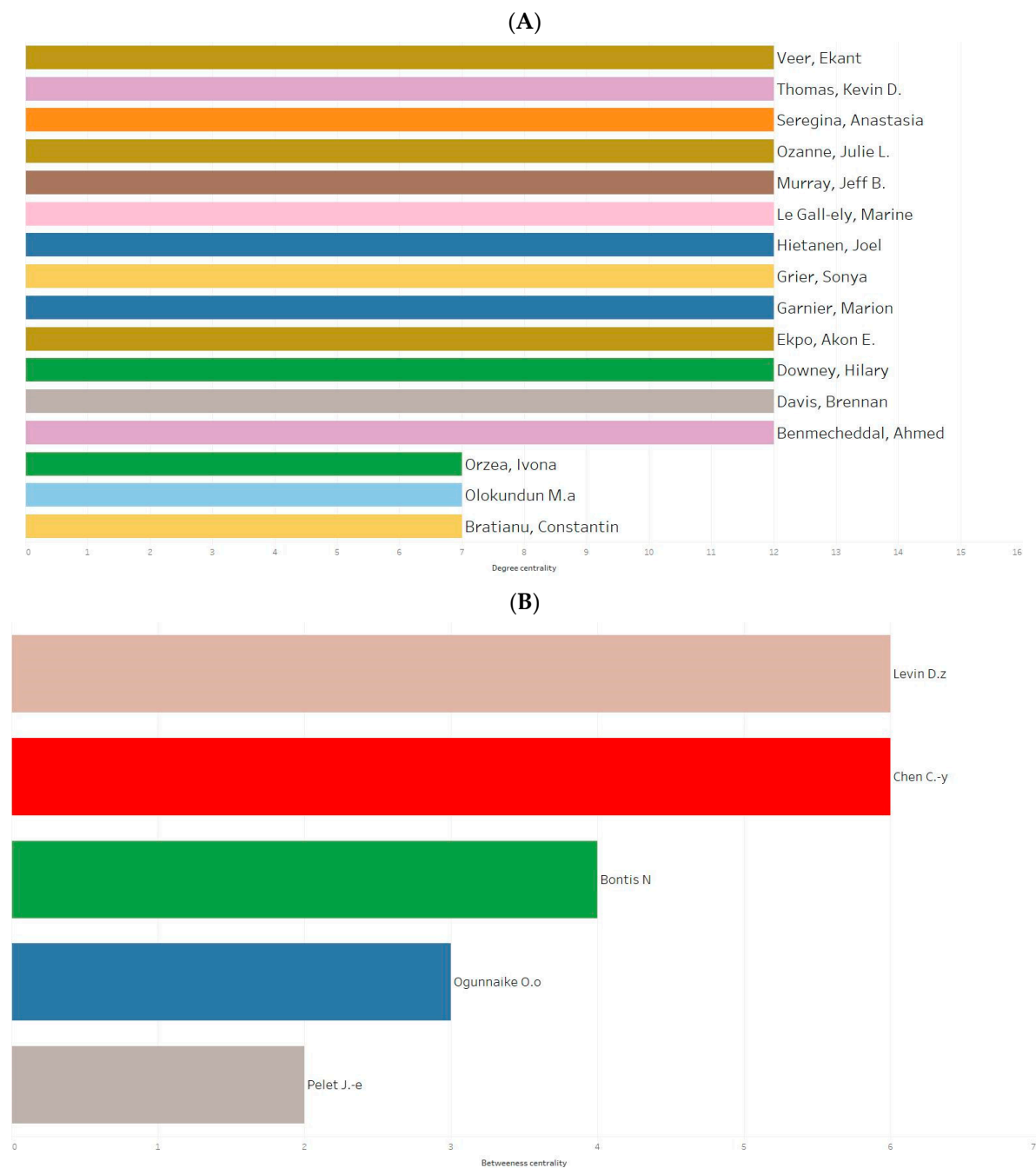


Figure 5. Key authors by coauthorship network by degree centrality (A) and betweenness centrality (B).

3.3.1. Embryonic Stage

In the embryonic stage, 13 articles were published. Although the number of articles is small, Figure 6 shows the most significant topics: the problems that business schools have with information flows, the offer of courses and the generation of tools to teach knowledge management in universities and the skills in knowledge management that business students should develop.

This is a sample of the most relevant articles in the growth highest stage (Table 6). Hernaus, Cerne, Connelly, Vokic and Škerlavaj [82] contributed to research by focusing on academic situations where colleagues respond to explicit requests by hiding knowledge. Levin, Walter and Murnighan [95], in a study with MBA students, suggested that dormant relationships can be a valuable source of knowledge and social capital. Hidalgo and Albors [88] provided evidence to support that business schools are developing innovative methodologies and tools based on knowledge. Ungureanu and Bertolotti [106] suggested that if business schools loosen their programs' infrastructure and encourage trial and error interaction they can increase knowledge sharing between academics and practitioners. Perry-Smith and Shalley [107] in a study with MBA teams concluded that both outside ties with nationality-heterogeneous individuals and weak outside ties independently facilitate team creativity. Finally, Charosky, Leveratto, Hassi, Papageorgiou, Ramos-Castro and Bragos [108] presented results of a learning experience carried out by three universities. They found that engineering students increased their ability to ideate more disruptive solutions based on their interactions with business and design students.

Table 6. Main papers in the stage of highest growth.

Title	Publication Year	Authors	Normalized Forward Citations
Evasive knowledge hiding in academia: when competitive individuals are asked to collaborate	2018	Hernaus, T., Cerne, M., Connelly, C., Vokic, N. and Škerlavaj, M.	0.681818
Dormant ties: The value of reconnecting	2011	Levin, D., Walter, J. and Murnighan, J.	0.396296
Innovation management techniques and tools: A review from theory and practice	2008	Hidalgo, A. and Albors, J.	0.389034
Building and breaching boundaries at once: An exploration of how management academics and practitioners perform boundary work in executive classrooms	2018	Ungureanu, P. and Bertolotti, F.	0.30303
A Social composition view of team creativity: The role of member nationality-heterogeneous ties outside of the team	2014	Perry-Smith, J. and Shalley, C.	0.302326
Challenge-based education: An approach to innovation through multidisciplinary teams of students using design thinking	2018	Charosky, G; Leveratto, L; Hassi, L; Papageorgiou, K; Ramos-Castro, J; Bragos, R.	0.242424

3.4. Keywords

Based on the tool developed by Lee, Lee, Seol and Park [109], a keyword map, divided into four quadrants to visualize the evolution of concepts about knowledge sharing in business education, was created. A topic is considered core according to the relevance given by the H index. A topic is declining when it is important in the embryonic and emerging stages, but not in the growth stages. On the other hand, a theme is defined as growing when it has increased in the last stages. Finally, a subject is emerging when it appeared in the last stage with relevance.

Table 7 presents the analysis of keywords according to four criteria. The most representative core keywords were knowledge management, knowledge transfer, knowledge sharing, business education, knowledge creation and knowledge exchange. The three more frequent growing keywords were knowledge sharing, higher education and e-learning. The emerging keywords were entrepreneurship education, management, intellectual capital and problem-based learning. The declining keywords on publications on knowledge

sharing in business education were human resources management and curriculum development.

Table 7. Analysis of keywords about knowledge sharing in business education.

Emerging Topics	Declining Topics	Core Topics	Growing Topics
Entrepreneurship Education management	Human resource management	Knowledge management Knowledge transfer	Knowledge sharing Higher education
Intellectual capital Problem-based learning	Curriculum development	Knowledge sharing Knowledge exchange and creation	E learning

4. Discussion and Conclusions

In the research on knowledge sharing in business education, four stages were identified in the period 1997–2020, which were called: embryonic, emergent, young growth and high growth. The number of articles published has been increasing. The current period, high growth, so far includes 151 articles.

Concerning networks of authorship, the number is still low. Only two of them are considered significant. According to the analysis that was carried out, there are no large clusters of thematic axes on the subject of knowledge sharing in business education. In the embryonic stage, articles were published on the problems that business schools have with information flows, the generation of tools to teach knowledge management and the skills in knowledge management that a business student should develop.

In the emergent stage, there were no topics with a significant volume of articles. Some themes were: teaching knowledge management in business schools, active learning and knowledge sharing, the motivation of business students to transfer knowledge, barriers that inhibit knowledge management and the relevance of technology and innovation management education in business schools.

In the growth young stage, although no topic was a trend, there is a nascent interest in tools for knowledge sharing in business education. The main themes identified were knowledge sharing in social networks, knowledge management, transfer of knowledge in educational programs, the experience of companies with business schools about knowledge exchange, business schools and virtual learning, and communities of practice.

In the growth highest stage there is a marked interest in tools associated with knowledge sharing in business education. Some current topics are social capital and knowledge exchange, knowledge networks in business schools, knowledge transfer between business managers and students of these schools, skills associated with knowledge sharing, and knowledge sharing versus knowledge hiding in academic situations.

Based on the keyword analysis, the considered core words are knowledge management, knowledge transfer and knowledge exchange; the main emerging words are entrepreneurship education and problem-based learning; the principal declining words are human resource management and curriculum development; finally, the main growing words are higher education and e-learning.

In conclusion, knowledge sharing in business education is a rising research topic, where there are still no strong networks of researchers. Additionally, the identification of the best tools to share and build knowledge in the training process of business education students is under development. Finally, research on knowledge sharing as a means for generating innovations in the context of business schools is incipient.

From this study, further research is recommended on some topics: knowledge networks between students from different business schools, knowledge sharing between organizational managers and business students, innovative tools for sharing knowledge in times of the COVID 19 pandemic and the development of knowledge sharing competences in students applied to changing organizational contexts.

5. Practical Implications

There are multiple lessons from this research that can be applied to universities and institutions dedicated to training students in business education who, once graduated, will manage companies and public organizations.

Knowledge sharing is essential in the development of skills in business students that will later be used in organizations—for example, teamwork, leadership, culture management, and sustainable innovation. In complex contexts such as the current one, knowledge sharing is the main mechanism to design collaborative solutions tailored to respond to environmental needs. Additionally, in their role as leaders, administrators must constantly interact with their work teams to influence them in the strategies planned to achieve results. In the same direction, culture management requires persuasion skills, which are based on the exchange of ideas and beliefs. Innovation is another field where knowledge sharing is necessary to design or improve products and services.

There is evidence that the knowledge exchange improves academic achievement, the quality of interpersonal interactions, and attitudes to work with others. As a consequence, business schools should decrease the percentage of time they spend in lectures and increase the time and strategies in which students share knowledge, discuss problems and make decisions based on collective reflection. Some examples of techniques are discussion of business cases, group simulations, workshops, challenges, and projects.

Knowledge sharing has been growing in virtual environments, especially in the last year, where the COVID 19 pandemic restricted the option of face-to-face education in classrooms. Online education research has studied the role of cooperative learning through discussion and has found effectiveness in students' performance. The motivation of students increases when they participate in online group activities. Online sharing also contributes to focus the attention of students on the class topic.

According to research, one of the main blockers of knowledge sharing in business education is teacher-centered habits, where the main expected role of students is to be absorbers of information. Universities should promote online materials and webinars to their professors about how to move from traditional teaching to learning focused on participants. Students learn by doing, exchanging knowledge, expectations, and beliefs about reality. When students are active in their learning, content retention increases.

There is evidence that students increase their ability to ideate more disruptive solutions based on their interactions with members of organizations. Another practical implication of this review is the recommendation for universities to design experiences in which students transfer their skills to applied environments. Business students may interact with members of firms and public organizations to contribute to defining problems, propose solutions and participate in the design and improvement of products and services.

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