Knowledge Management Practices Integrated to Teaching Methodologies: An integrative review

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Abstract— This work has as its theme knowledge management practices/tools integrated into the educational scenario. In this bias, the research aimed to map knowledge management practices integrated into teaching methodologies in the educational scenario. To meet this objective, we carried out an integrative literature review to select works on knowledge management practices/tools integrated with teaching methodologies. As a result of the research, we identified such practices: Community of Practice, document (knowledge) management systems, good practices, knowledge mapping, wiki, blog, forum, guide, data mining, and analysis of social interactions. They were mainly used for creating and sharing knowledge with students and teachers. As limitations, we highlight a few current research using practices based on the area of knowledge management.

I. INTRODUCTION

The 21st century is characterized by constant changes, uncertainties, and instability resulting from technological advances, and mainly due to the COVID-19 pandemic. In our society, we accompany the transition from the industrial wave to the knowledge wave, and the school must accompany such transformations through changes in its teaching practices/methodologies.

In Education, some changes were implemented slowly, such as the integration of ICTs in didactic teaching practices, however, due to the pandemic, the teaching and learning process, for the most part, abruptly became fully mediated by technologies. digital. From this adaptation of classroom teaching practices to remote teaching, there is a latent need for innovation regarding the teaching methodology and integration of digital technologies (CARNEIRO, 2020).

In studies by Lacerda et al. [19] and Fleacã [14], based on innovation in the teaching and learning model, the authors highlight the importance of interdisciplinary approaches. In this bias, an area of research that has been gradually applied in the academic scenario is Knowledge Management – KM.

KM aims at the creation, sharing, and dissemination of knowledge, resulting from the interaction between people, processes, and technologies. It supports knowledge processes, and enables knowledge management, ensuring that people have the knowledge they need, where they need it, and when they need it [29].

In research by Alarcon [1], and Silva [30], the authors emphasize that KM contributes to the construction of knowledge among students, and its application in teaching enables innovation in the method of cognitive development, resulting in new ways of learning to learn. Its application is very important for the educational institution, since, like organizations, it aims to create knowledge from academic research, dissemination (education), and sharing through academic services to society.

Many authors highlight the potential benefits of KM for university professors, making professors more effective and knowledge processors more efficient [5]. Thus, knowledge management in education is of great importance to capitalize on recent teaching innovations and channel significant advances in e-learning and technology-enhanced education [5].

Knowledge management practices enhance the sharing, conversion, and creation of knowledge through the application of tools and methodologies, providing learning environments [22]. In this bias, based on the potential for innovation in teaching methodologies, this research aims to map knowledge management practices integrated into teaching methodologies in the educational scenario. We emphasize that aspects related to learning theories are not the focus of this study, but rather to identify research that adapted and used KM (KM practices/tools) to innovate in terms of the teaching practices of the actors involved. For this, a theoretical framework was used on KM and its tools and practices, as described in item two (2) of this article. The research also presents the methodological steps undertaken (item 3), and the results of the integrative review in item four (5).

This research becomes relevant since its result, in addition, to verifying the integration of KM into the teaching methodology, mapped KM practices/tools integrated into teaching methodologies, showed their potential as well as some difficulties encountered.

II.   KNOWLEDGE MANAGEMENT

Research on knowledge management emerged in the early 1990s as organizations became aware that productivity is related to knowledge and not only to the workforce. With the development of the economy and technological advances, the improvement and sharing of knowledge have become increasingly important, since it is the result of a systematic mix between strategies, tools, and techniques, aiming at the creation, sharing, and dissemination of knowledge in organizations.

With the technological evolution, and consequently the unlimited access to all kinds of information, the industrial society becomes the knowledge society, in which organizations start to use intellectual capital as their main wealth [9]. Such a society is characterized by the use of digital technology, mainly through communications networks. Thus, several potential variables that were not considered in the era of industrial society, such as contradictions, dilemmas, and polarities, among others, became important data, helping in the innovation process of companies, and guaranteeing competitiveness in the market.

KM is related to the development of technological and human segments, focusing on the creation, sharing, and dissemination of knowledge, resulting from the interaction between people, processes, and technologies. According to Vaccaro, Veloso, and Brusoni [36], and Davenport and Prusak [10], implementing ICTs in actions that address KM in the organization results in an environment conducive to knowledge sharing. Technological resources can drive greater participation and interaction in collaborative processes, contributing to the dissemination and sharing of knowledge.

In the literature, several definitions for KM are described, based on different scientific perspectives and ideological points of view. In this vein, the present research approaches KM as a multidisciplinary field of study related to three variables: process, people, and technology [9]. The systematic relationship between these variables allows the transformation (conversion) of information into knowledge, which can be made available and shared among individuals. This definition is adhered to, since the multidisciplinary KM has shown applicability in educational institutions, contributing significantly to the teaching and learning process.

According to Alarcon [1] and Silva [30], the application of KM in teaching, using ICT tools and resources as a strategy, enables innovation in the cognitive development method, resulting in new ways of learning to learn. According to Servin [29] KM, through the interaction between people and technology, results in a new culture of collaboration and innovation in organizations. To this end, Servin [29] shows that KM aims to manage knowledge, ensuring that people have the knowledge they need, where they need it, and when they need it.

In contrast to GC's significant achievements in the business arena, GC in the educational and academic arenas achieved far fewer. With the development of society, research on KM in the educational field has become hot and promising.

III.   KNOWLEDGE MANAGEMENT PRACTICES AND TOOLS

To identify, create, store, share, and apply knowledge, it is necessary to carry out routines, and sets of practices that integrate various activities, procedures, techniques, and systems related to the development and application of knowledge in organizations. This set of practices enables the implementation of KM in organizations.

Knowledge management practices aim to develop the skills and knowledge sharing of those involved,

contributing to organizational performance, and job satisfaction, enabling organizational innovation, and contributing to strategic decision making. For this, they involve the use of methodologies and tools for sharing.

Knowledge management practices enhance the sharing, conversion, and creation of knowledge through the application of tools and methodologies, providing learning environments [22]. According to the institution's need, various KM practices can be integrated into its activities to improve processes, practices, and (or) operations [12]. In the literature there is a diversity of practices and tools related to knowledge management, however, in this research, we will address the practices listed by Pinheiro [28], described below.

Table 2 - KM practices

Practices and tools	Description
After-Action Analysis or Lessons Learned	The technique of evaluating and capturing lessons learned after the completion of a project. It allows the individuals involved to discover what and why it happened, what needs improvement, and what lessons can be learned from the experience
Peer assistance	A technique used to solicit help from colleagues and experts on an important issue being faced. Known as "learn before doing"
Knowledgebases (wikis)	Bases that keep records of important explicit knowledge.
Internal and external benchmarking	Practice is related to the systematic search for the best references to compare the organization's processes, products, and services
Blogs	A simple site whose structure contains a list of entries, usually in reverse chronological order. It allows quick updating and can be written by several people
Brainstorming	Dynamics for generating new and unusual ideas. The process is divided into two phases: divergence and convergence. During the dissenting phase, everyone agrees to defer their judgment and the ideas will be treated as valid. In convergent, participants positively use their judgment, that is, they look for what they like about ideas before finding faults
Capturing ideas and learning	Continuous, collective, and systematic capture of ideas and learning in simple formats based or not on technologies. Such knowledge is captured in auxiliary digital spaces, such as mobile devices, emails, and blogs, among others.
Knowledge clusters or collaborative teams	Groups that, as a result of their meeting, collaborate, create, innovate and share new knowledge
Coaching	The people management style provokes actions for their development. The coach does not participate in the execution of the activities
Communities of Practice or Communities of Knowledge	Sharing knowledge in a group and networking around a common interest
Corporate Education	Learning system where employees develop their skills and behaviors according to the organization's goals. It comprises continuing education processes, established to update personnel uniformly in all areas of the organization. It can be implemented in the form of the corporate university, distance learning systems, etc.
Space (physical)	Physical space with a design suitable for sharing information, interaction, and exchange between employees
Space (Virtual)	A form of communication and sharing where participants can work together, even if physically separated. Experiences, calendars, and projects, among others, are shared. Forums can be created to share opinions and ideas, and virtual interaction rooms, where it is possible to hold video conferences, chats, and web pages, among others
Knowledge Management Assessment Tools	Use of questionnaires to conduct a quick assessment of the organization's readiness for Knowledge Management.
Advanced search tools	Use of advanced commands for searching in search engines. Understanding these tools can result in a significant improvement in the quality of search results. (YOUNG, 2010).
Forums /discussion lists	Spaces to discuss, homogenize and share information, ideas, and experiences that will contribute to the development of competencies and the improvement of the organization's

	processes and activities
Knowledge cafe	Group discussion to reflect, develop and share any thoughts and ideas that arise, informally and suspending all judgments
Finder, white pages, or yellow pages	IT tools are used to locate specialists anywhere in the organization, in an easy and fast way, by mapping their competencies and skills
Knowledge mapping or auditing	Record of organizational knowledge about processes, products, services, and customer relationships. It includes the elaboration of maps or knowledge trees, describing flows and relationships of individuals, groups or the organization as a whole
Best practices (Best practices)	It refers to the identification and dissemination of best practices, which can be defined as a validated procedure for carrying out a task or solving a problem. They are documented through databases, manuals, or guidelines
Organizational Memory	Record of organizational knowledge about processes, products, services, and existing relationships in the organization, which can be retrieved when necessary for the decision-making process
Mentoring	It helps the employee to achieve their goals through personal follow-up in a technical, emotional, and strategic way. The situation in which a more experienced professional intentionally transfers his experience and knowledge to a younger professional, promoting the apprentice's career development
Mining or Data mining	The technique of extracting previously unknown and maximum comprehensive information from databases, to use them in decision making
Skills plan for the knowledge worker	Personal competence plan for individuals to develop the critical skills needed to become knowledge workers
Corporate Portal	web space for the integration of corporate systems, with data security and privacy, providing access to relevant information and applications, and also as a platform for communities of practice, knowledge networks, and best practices. It supports the organization's mission, strategies, and objectives, collaborating for the creation and management of a sustainable business model
Learning review	The technique is used to help individual and collective learning during the work process
Social Networking Services	Services that support social networks are formed by groups of connected people who share common interests, content, and relevant documents
Document Management Systems	This system proposes the organization and categorization of documents and information to make them available in a more practical way to users
Social Network Analysis	Social Network Analysis (SNA), or analysis of social interactions, is a way of mapping and measuring existing interactions and flows in the organization. It has the function of identifying, through this mapping, who are the most sought-after sources of information and among whom the information is most shared.
Storytelling or Narratives	In this practice, people share through words, images, and sounds, facts from their experiences, literally telling a story.
Taxonomy	The technique provides the structure to organize information, documents, and libraries deliberately. It helps people navigate, retrieve and store needed information across the organization. It creates a natural workflow and knowledge needs in an intuitive structure.

KM practices are significant, however, alone, they are not effective, and they need human interaction. In the academic context, knowledge management and practices for its sharing have gradually been integrated into didactic practices since higher education institutions (HEIs) are engaged in significant levels of knowledge production, generated by academics, and it is very necessary to manage this knowledge efficiently [2].

IV. METHODOLOGY

The scope of the work is aligned with KM practices/tools integrated into the teaching methodology in the educational scenario. Theoretical studies, or studies that involve practices identified in Table 1, will only be included in the review if they are integrated into the teaching methodology, based on Knowledge Management. As already described, it is not the focus of this investigation to address learning theories, but rather to

identify and describe how KM practices are used in teaching methodologies in the educational scenario.

The problem will be addressed through an integrative literature review, because through this type of review it is possible to present different perspectives on a phenomenon of interest, to broaden the understanding of the topic of study seeking a foundation in theoretical and practical studies that associate knowledge management practices/tools, and teaching methodology in the educational scenario.

For this review, we used the *Scopus database*, as it covers different types of publications in different areas of knowledge.

A search *string was created* in these databases and applied to the fields corresponding to the article title, abstract, and keywords, excluding the book and book chapter file types, as available in each database. The search

strategy developed sought to understand the main terms and descriptors appropriate to the themes of knowledge management practices/tools and teaching methodology, including synonyms, to expand the retrieval of information.

As we had noticed in previous readings, many studies do not use the term "knowledge management practice", we chose to include in the search strategy the broader term "knowledge management" to identify in studies that addressed KM the use of some of the practices described in table 1. The search *string* also comprised the *Boolean operators OR* and *AND* and can be seen in table 2, and was performed on January 3, 2022.

Table 2 - Search strategy and results obtained

Basis	String	Field	Results
Scopus	((*" knowledge management practice "*) OR (*" knowledge management"*) OR (*" knowledge management tool"*) OR (*" knowledge management method "*) OR (*"km practice "*) OR (*"km tool"*) OR (*"km method "*)) AND ((*" teaching methodology "*) OR (*" teaching practices "*) OR (*" pedagogical practices "*)))	*Article Title, Abstract, Keywords*	129

Of the 129 articles retrieved in the initial search, 4 were eliminated because they were duplicates. After the elimination of duplicates, step 1 of article selection was carried out, which consisted of reading all titles, abstracts, and keywords of the 12 5 selected articles. At this stage, 47 articles were excluded because they did not fit the proposed theme, or because they did not specifically address KM in the academic setting.

In the second stage of analysis, all texts of the remaining 78 articles were read in full, excluding another 64 works because they were not theoretical or empirical studies on the use of KM practices/tools as methodology, teaching practice, according to the criteria of inclusion and exclusion previously defined, explained in table 3.

Table 3 - Inclusion and Exclusion Criteria

Exclusion Criteria	Inclusion criteria
• Articles dealing with KM practices/tools in organizations; • The article does not present KM practices/tools used in didactic practices. • It does not address knowledge management in the educational context.	• Articles with a KM approach in the educational context; • Articles that address KM practices in didactic practices (or methodologies) of teaching in the educational institution.

Source: Authors (2022)

The number of documents initially retrieved, as well as the update of the number of documents corresponding to

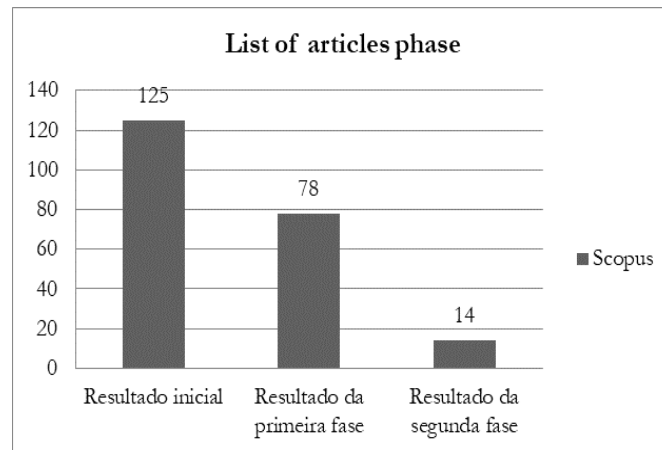each review phase, separated from the review phase, can be seen in Figure 1.

Fig.1 - Quantitative relationship by review phase.

Source: Authors (2022)

Thus, for the composition of this integrative review, a total of 1 4 articles were exposed in Table 4, whose content was summarized and synthesized in this work.

Table 4 - Articles selected to compose the integrative review

	Title	Year	authors
1	faculty development and community of practices: Exploring their interplay to facilitator change in pedagogical practices at HEI's	2021	Kandakatla and Palla
2	Investigating undergraduate student learning experiences using the good practice learning and teaching for sustainability education (GPLTSE) framework	2021	Holdsworth and Sandri
3	design and Evaluation of a Teaching-Related knowledge Sharing System to Meet the needs of Computer Science Instructors	2020 A	Almujally and Joy
4	The Framework for Enhancing the sharing of teaching practices among university Instructors	2020 B	Almujally and Joy
5	Designing a system for enhancing the sharing of best teaching practices among universities ' instructors	2020 B	Almujally and Joy
6	Twelve tips for implementing a community of practice for faculty development	2019	Carvalho-Filho, Tio and Steinert
7	research on Educational Knowledge Map Application in Japan	2019	Li *et al.*
8	Using a blog and text mining to evaluate knowledge construction	2019	Zambon *et al.*
9	The Neuro- Subject : A Living Entity with learnability	2019	Fidalgo-Blanco, Sein-Echaluce and García-Peñalvo
10	Effective reuse and sharing of best teaching practices	2017	Al- Rasheed and Berri
11	Knowledge management practices: a case study of Pre-Forum of teaching practices of Estacio de Santa Catarina	2016	Panisson *et al.*
12	interaction analysis of a blog/ journal of teaching practice	2015	Pavo and Rodrigo
13	sharing and co-creation of Innovative teaching Practices in Business Analytics – Insights from an Action Design Research Project	2014	Marjanovic
14	Gathering Practice sharing and problem-solving on a Single Platform for Teacher Training: A Collaborative Platform Model for Teacher Professional Development	2011	Condamines

Source: Authors (2022)

Based on the selected research, we identified and described the KM practices/tools used as teaching methodologies in the educational scenario, as described in section four (4).

V.   RESULTS AND DISCUSSION

With technological advances and, consequently, the emergence of new media and digital resources, it is essential to develop new strategies to enhance and innovate the process of building the knowledge of the

actors involved. In this bias, knowledge management is of great importance to capitalize on teaching innovations enhanced by digital technologies [5].

Thus, based on the analysis carried out on the selected articles, we can identify the following knowledge management practices integrated into teaching methodologies, and used as didactic practices by teachers to share knowledge:

Table 5 - Articles selected for analysis

Knowledge Management Practices	Authors
Community of Practice - CoP	Kandakatla and Palla, Carvalho-Filho, Tio and Steinert, Condamines
Good habits	Holdsworth and Sandri, Al- Rasheed and Berri
Document management systems (knowledge)	Almujally and Joy, Fidalgo-Blanco, Sein-Echaluce and García- Peñalvo
Guide	Carvalho-Filho, Tio and Steinert
Knowledge mapping or auditing	Li *et al.*
blog	Zambon *et al.*, Pavo and Rodrigo
Forum	Panisson *et al.*
Analysis of Social Interactions	Pavo and Rodrigo
Wiki	Marjanovic
Data mining	Zambon *et al.*

Investigations on Communities of Practice - CoPs - were identified in the research of Kandakatla and Palla [18] and Carvalho-Filho, Tio, and Steinert [7]. A CoP can be formed by a group of individuals, in person or online, who share and work collectively towards a common goal. CoPs have the following characteristics: Domain – a shared value or purpose identified by CoP members; Community – membership of a group of people who have agreed to work for the domain through involvement in joint activities and; Practice – a curated list of initiatives, resources, and tools that members share as part of their participation in the CoP.

Kandakatla and Palla [18] aimed to investigate the role of a community of practice in achieving sustainable changes in teaching practices after the completion of the faculty development program in India. To that end, they created a CoP before the start of the technology-enhanced learning teacher development program to encourage and build a sense of community among participants. The results of the thematic analysis of the data revealed that CoP members helped each other through the exchange of ideas, various clarifications, feedback, and exchange of knowledge. Participants with varied prior teaching

experience were observed to support each other in designing and developing course websites (tacit knowledge development).

In addition to the studies by Kandakatla and Palla [18], Carvalho-Filho, Tio, and Steinert [7] developed a guide, through a literature review, with tips for implementing communities of practice for faculty development and, consequently, the implementation of best teaching practices. The authors emphasize that a successful CoP creates and shares knowledge in the context of a specific practice to develop the competencies of those involved and guide the innovative process of creating or reformulating practices, solving critical problems, and facilitating the transfer of best practices.

In the implemented guide Carvalho-Filho, Tio, and Steinert [7] list the following tips: Gather a core group to launch the process; Articulate the goals and value of the CoP; Start with a specific task or project, and make it problem-oriented; Keep the CoP open; Intentionally invite members with experience and new ideas (innovation); Choose a facilitator; Make it worthwhile for the associates and the institution; Work to ensure institutional support;

Promote sustainability; Communicate success; Stay online; Evaluate the CoP.

Another KM practice in the educational scenario refers to the integration of good practices into the teaching methodology in the research identified in the studies by Holdsworth and Sandri [16], Al- Rasheed and Berri [5]. Best or best practices are accumulated practices (activities) that have been proven to work well, give good results, and, therefore, can be recommended as an effective way.

Holdsworth and Sandri [16] investigated good practices for sustainability education. For this, they implemented and applied a model of learning and teaching good practices identified in the literature (synthesis of good practices) for sustainability education called GPLTSE. The study explored the use of GPLTSE best practices, their effectiveness in large first-year core courses, and in developing the skills and abilities of those involved through student-centered activities.

Based on the importance of identifying good practices highlighted by Holdsworth and Sandri [16], we emphasize the importance of identifying and sharing them. Almujally and Joy [2] point out that knowledge is not captured or exchanged efficiently between professors who teach the same courses. In this bias Al- Rasheed and Berri [5] implemented a knowledge management system for communities of instructors, enabling the identification, sharing, and appreciation of good practices used in the educational scenario.

Al- Rasheed and Berri [5], developed a model with identified good teaching practices and used a management system to acquire, codify, share and reuse such practices from a community of instructors. In their investigation, the authors found that: the KM approach seems more suitable for dealing with the experience of instructors, as it takes the form of an accumulation of experiences and best practices to be articulated, helping them to identify and gradually specify their experience using well-specified web forms; instructors who contributed to the system expressed satisfaction that their contributions were rated by the instructor community; the structure developed is intended to support instructors in providing quality teaching and increasing collaboration within specialist communities; incentive for evaluation and sharing of instructors' experiences.

The investigations of Almujally and Joy [2][3][4], approached from the elaboration of the structure, the process of development, and the application of the management system of teaching practices. The authors emphasize that there are several structures and frameworks of systems for knowledge management, but that there is no standardization of them. So they standardized a knowledge management system to assist instructors in publishing and sharing up-to-date and useful teaching practices in a quick way that can be clearly understood and reused by others.

The structure of the implemented system is composed of a set of pre-specified attribute fields to create a record of teaching practice. The system assists users in describing various teaching practices, controlling the type of information requested, and providing an adequate framework to capture the user's experience. As a result of the research, the authors show that the model provided by the system is effective and of sufficient value to those involved that it supports the capture of complete, clear, and consistent teaching practices [2][3][4].

To apply the concept of organizational learning in academic disciplines, Fidalgo-Blanco, Sein-Echaluce, and García- Peñalvo [13] adapted a management system (plugin for the WordPress content manager). The authors report that in the proposed case study, the student is considered a member of the organization that can learn and create, and that the organization must improve the learning of its members. For this, it must promote the creation of individual and group knowledge, as well as their management, so that they impact both the organization and the individual himself.

In this bias, they used the RT-CYCLE Model, which uses the basic characteristics of different theories, models, and active learning methods. This model is characterized by being very simple and can be used punctually or continuously in the development of a subject. The RT-CYCLE model is based on the following phases: Phase 1 Action-reflection; Phase 2 Creation of proofs; Phase 3 Feedback; Phase 4 Knowledge creation. This model was used around the realization of an exercise carried out in person and virtual. The knowledge management software created was applied continuously during all phases in real-time, the knowledge produced by students and faculty were presented through the software. As a result, the authors highlight that the activities that generate organizational knowledge and types of corporate content created during these actions encouraged the creation of knowledge among the subjects.

To analyze the interaction between teachers/students Pavo and Rodrigo [27] used two knowledge management practices/tools: the blog for recording and sharing teaching practices and teaching experiences of teachers/students, and the analysis of social interaction carried out on the blog. Blogs are a web tool that allows you to create personal web pages with textual information arranged in reverse chronological order. They provide the means to write diaries in a public web-based space and allow readers to comment or add information. The blog was used

to: give students a space for reflection; allow interaction between students so that they can discuss their experiences and find support; become a faculty monitoring tool, and keep all comments in a structured form for reference when necessary, both for teaching and research purposes and students' records.

To describe significant processes such as group cohesion or collaboration, social interaction analysis was performed. Through such analysis, the authors highlighted the importance of affective and cognitive processes in the interaction of students regarding their teaching practice, being an important factor for greater collaborative construction of knowledge.

The blog resource was also used in Zambon *et al.* [39] as a tool for student collaboration in active learning disciplines. After in-class presentations and discussions, students published the result and participated in new discussions on the online platform. To solve operational issues of workload management, grade assessment, and text quality, an educational data mining tool was developed, based on natural language processing. Educational data mining (EDM) is the application of computerized methods to detect patterns in large collections of educational data that would otherwise be difficult or impossible to analyze. According to the authors, the use of these practices reduced absenteeism and the failure rate of students.

In addition to the blog, Marjanovic [21] describes the results of a design research project focused on sharing and co-creating innovative Business Analytics - BA - practices using the wiki resource. All design artifacts were created and implemented through learning groups. The online environment was used to support the design and sharing of innovative teaching practices. After conducting the research, the authors observed that the design of a wiki-based collaborative environment was not the main challenge of the project. The main challenge identified is related to the learning activities in BA targeting the different levels of knowledge and cognitive skills that could be implemented in the classroom, in different ways, using different instructional projects.

Another KM practice/tool highlighted in the review was the discussion forum. Panisson *et al.* (2016) - analyze the pre-forum of Teaching Practices of Estácio de Santa Catarina aligned with KM practice. According to Batista (2006 *apud* PANISON *et al.*, 2016), the forum (in person or online) is an important KM practice linked to people management in higher education institutions. Initially, this practice was applied in the institution at the national level, but soon there was a need for a closer approach between the practice and the teachers, implementing regional

forums to previously select the teaching practices. Panisson *et al.* (2016) highlight that forums enable knowledge management at the team level, allowing the teacher to apply an innovative teaching practice, identify opportunities for application, and creation of new practices, being a tool that allows the storage and sharing of knowledge among all teachers at the regional level through the Pre-Forum.

From an initial investigation into the exchange of innovative teaching practices and experiences between teachers in online forums, Condamines [8] shows that many online environments used are not specific to CoPs, limiting the creation and sharing of knowledge. In this vein, the author proposes an online platform model to support the professional development of a community of practice. For this they implemented a web platform for knowledge elicitation (teaching practice) based on exchanges between teachers, capitalized on individual memories with the associated context; problem-solving exchanges, capitalizing on problems (and their context) and solutions given by other teachers; sociability and participation of members with a Web 2.0 approach and user profile management.

To understand the research and application of knowledge maps in the field of education in Japan, Li *et al.* (2019) perform a literature review based on selected Japanese academic databases. The review shows that knowledge maps are used mainly in the area of education support. According to Li *et al.* (2019), the knowledge map is a concept that originates from the geographic map to map knowledge. Although the knowledge map does not have a clear definition at the moment, generally speaking, it presents knowledge as a map to indicate knowledge catalogs and knowledge resources, and it can store various connections between the knowledge resource and the knowledge itself. As the most important feature is that it can visualize and display information structurally in map form. As a result of the review, the authors show that the knowledge map has many advantages in structuring, visualization, and systematization, but its construction is complex and requires high information technology. Therefore, it is more difficult to apply the knowledge map in education than the concept map and the mind map. There are few research cases, especially in database construction, knowledge point extraction, and multidimensional visualization.

From the evidenced research, we identified interdisciplinary research that addressed the use of KM practices integrated into teaching methodologies, as didactic practices in the educational context, namely: CoPs, document management systems, good practices, knowledge mapping, wiki, blog, forum, guide, data mining

and analysis of social interactions. However, few current studies use the KM approach as practice and/or teaching methodologies among students. We found that most studies focused on sharing innovative teaching practices among teachers.

In addition, many of the excluded works described activities that would fit KM practices/tools but were not based on the KM area. In other words, many strategies used in class are KM practices/tools, however, not have an approach, and do not take advantage of KM's potential for the process of creating and sharing knowledge among students.

VI. CONCLUSION

This research aimed to map knowledge management practices integrated into teaching methodologies in the educational scenario. To meet this objective, we carried out an integrative literature review, which made it possible to identify the following KM practices/tools: CoPs, document management systems, best practices, knowledge mapping, wiki, blog, forum, guide, data mining, and analysis of social interactions.

It can be seen that most of the selected studies were applied to share innovative teaching methodologies or practices among teachers. Based on this, we highlight the CoPs, being a strategy identified in some studies, in which ICTs can further enhance the creation and sharing of knowledge.

We also evidenced that CoPs and document management systems, or knowledge management systems, as well as forums, were used to share innovative teaching practices among teachers and to improve knowledge. The practices using Blog, Wiki, analysis of social interaction, and data mining were applied to the students. Blogs and wikis encouraged greater participation and interaction of students, in which the analysis of social interactions and data mining contributed to measuring such results.

As limitations, we identified that few current studies use knowledge management practices, taking the area of knowledge management as an approach. Often such practices were used, but with a focus on active methodologies. Further investigations are needed to analyze knowledge management practices/tools and their similarities and differences concerning active methodologies and to propose actions that add the potential of the two approaches in terms of teaching methodologies and practices.

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