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The current understanding of knowledge management concepts: A critical review

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Abstract

Background: Higher education institutions include experts who are knowledgeable. Knowledge management facilitates institutions to enhance the capacity to collect information and knowledge and apply it to problem-solving and decision making. Through the review of related studies, we observed that there are multiple concepts and terms in the field of knowledge management. Thus, the complexity and variety of these concepts and definitions must be clarified. Considering the importance of clarifying these concepts for utilization by users, this study aimed to examine the concepts related to this filed.

Methods: The methodology used in this study was based on the Carnwell and Daly's critical review method. An extensive search was carried out on various databases and libraries. A critical and profound review was carried out on selected articles. Many wandering concepts were found. Identified concepts were classified into seven categories based on conceptual proximity. Existing definitions and evidence in relation to extracted concepts were criticized and synthesized. The definitional attributes for them were identified and a conceptual identity card was provided for each of the concepts.

Results: Thirty-seven concepts with the most relevance to the field of knowledge management were extracted. There was no clear boundary among them, and they wandered. To avoid more confusion, concepts were classified according to semantic relation. Eight categories were created; each category consisted of a mother concept and several other concepts with similarity and proximity to the meaning of the original concept. Their attributes have been identified, and finally, each of them was presented in the form of a conceptual identity card.

Conclusion: Through critically reviewing the literature in this field, we were able to identify the concepts and realize their attributes. In this way, we came to a new interpretation of the concepts. At the end of the study, we concluded that some of the concepts have not been properly defined and are not properly located in the knowledge management field; also their application is uncertain.

Keywords: Knowledge management, Knowledge translation, Knowledge transfer, Knowledge generation

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Introduction

The organization in the age of knowledge is an organization that is based on the best available knowledge and in-

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↑What is "already known" in this topic:
There are numerous and complex concepts in the field of knowledge management that have not been clarified, and most of them are used incorrectly. For example, in many studies, the concept of knowledge management and knowledge translation are used interchangeably, and there is no distinct boundary among concepts.

→What this article adds:
The identified concepts were wandering. To avoid more confusion, concepts were classified according to semantic relation. Eight categories were created, including a sentinel concept and several other neighbor concepts. Their attributes have been identified, and finally, each of them was presented in the form of a conceptual identity card.

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formation. To succeed in today's challenging organizational environment, organizations need to learn from past mistakes rather than repeating those mistakes. This process occurs through knowledge management (1, 2). Knowledge management (KM) is important, especially for organizations that their successes depend on the production, use, and integration of knowledge by professionals and employees. Higher education institutions are made up of experts who are knowledgeable. KM is a new field in the academic environment, and many universities are actively involved in related activities in this field (3). Conferences and seminars are taking place at the national and international levels in this regard. In the field of education, due to the need to explore the power and intellectual capital available to share experiences, this area has been very much considered (4). All knowledge production organizations such as research, development centers and higher education institutions from colleges to universities are looking for new concepts in their favorite subject. They also help create knowledge through various programs, considered as "knowledge houses" (5). So, the knowledge of the professors flows to the students and new knowledge is produced. Information is created in various forms and sources such as books, articles, dissertations, reports, and more. Knowledge management helps these institutions to enhance the capacity to collect information and knowledge and apply it to problem-solving and decision making (6). Therefore, evidence shows that any academic institution is associated with knowledge. In these institutions, the information and knowledge gained in the scientific community's core area should be disseminated for further growth (5). But, there are challenges in this direction. Studies have demonstrated that knowledge created in educational institutions is not properly stored and obtained. Most of the time, knowledge created in that system remains unknown and is considered as gray literature (6). The academic environment is considered as the knowledge houses, but if the generated knowledge in that organization is not properly organized, it will minimize its usefulness and leads to repeat activities (7). Despite the importance of knowledge management for educational systems, there is still no awareness about its development by academics. There is a need to create a culture of sharing knowledge among professors, staff and students who are still afraid of losing their knowledge through exchange and dissemination (8). The use of information communication technology and the development of advanced skills in the training of professions for the purpose of participation, communication, acquisition, recording and dissemination of knowledge are used very poorly in universities. Therefore, they need to adopt a policy in this regard (7). New educational systems are market-oriented and are becoming entrepreneurs. They should be accountable to the academic governance system. Therefore, educational institutions and academics faced with global pressures, research, and interdisciplinary subjects. In the complexity of such as global education market, there is a need for a motivating environment (6).

We mentioned the importance of knowledge management in the educational system, as well as the existence of challenges in this direction, but although much research has been done in this regard, knowledge workers, those who are willing to do research or scientific activity in this area face difficulties. The main reason for this problem is that there are numerous and complex concepts in this area that have not been clarified, and most of them are used incorrectly. For example, in many studies and even by academics, the concept of knowledge management and knowledge translation are used interchangeably, and there is no distinct boundary among concepts. On the other hand, despite the multiplicity of concepts in this field, the research that has examined all of these concepts together has not been found. Considering the importance of clarifying these concepts for utilization by users, the first step in this direction is to identify and clarify concepts associated with knowledge management. Therefore, in this study, we intend to examine the concepts and definitions related to them through a critical review method, accordingly identify their attributes, and based on the identified attributes, concepts become clear.

The result of this study can help managers, policymakers, professors, students, and researchers who after us, intend to carry out research related to the field of knowledge management.

Methods

Our methodology was based on the critical review of the literature introduced by Carnwell and Daly. The following five steps were performed; 1- detremination the scope of the review, 2- identification relevant information resources, 3-literature review, 4-writing the review,5- application of the review results in the study (9).

The review scoop was theoretical research published in the research journals. An extensive search was carried out on various databases (google scholar, PubMed, Embase, Elsevier, Scopus, Iran Medex, SID, and online libraries and dictionaries). The main keywords in the search were: knowledge management concepts, knowledge management stages, knowledge management implementation, knowledge management in higher education, and knowledge management in medical education. As a result, numerous articles were found. To restrict the search results, we set the inclusion criteria and exclusion criteria. Inclusion criteria were the studies and books related to knowledge management concepts without time limitation. Non-academic research was the exclusion criteria. The articles were examined superficially. Then the primary screening was done on the titles. So, a summary of the articles was studied and those articles that were most closely related to the concepts of knowledge management were selected to study the full text. Priority in reading was based on their relevance to study objectives and literature with more conceptual richness. A critical review was carried on publications with the purpose of clarifying the boundary among concepts. Thirty-seven concepts that were involved in the KM process were extracted. Since there were many wandering concepts in this path, in order to avoid confusion, they were examined based on semantic proximity in separate categories. Each category included a mother concept and other related concepts to it. Then by synthesizing existing definitions and evidence about each of the concepts, we tried to identify the characteristics on which they

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are defined. Ultimately each of the concepts was presented in the new classification based on these characteristics.

Results

There were many wandering concepts in the field of knowledge management, in order to avoid bewilderment; concepts were examined based on semantic proximity in separate categories. Each category included a mother concept with related concepts to it. By critique and comparing the definitions and evidence about each of the concepts, their attributes were identified. Finally, based on these features, a conceptual identity card for each concept was presented. Our result presented in nine categories: knowledge Generation (knowledge acquisition, knowledge selection, knowledge building, knowledge creation, knowledge capture), Knowledge processing(knowledge synthesis, knowledge integration, knowledge refinement, knowledge tailoring, knowledge customization)knowledge storage (knowledge assimilation, knowledge package, knowledge documentation, knowledge indexing), Knowledge transfer(knowledge sharing, knowledge exchange, knowledge dissemination, knowledge publication), Knowledge capitalization(knowledge commercialization, knowledge valorization), Knowledge brokering, Knowledge utilization(, knowledge adoption, knowledge adaptation, knowledge reuse), Knowledge translation, and Knowledge management.

In the following, the conceptual identity of each of the concepts, which includes the specific features about that concept, is introduced.

Knowledge Generation: Knowledge acquisition, knowledge capture, knowledge selection, knowledge creation, knowledge building.

Knowledge acquisition attributes

Purpose: The purpose of knowledge acquisition is to enhance the organizations' competitive edge through increasing an organization's operational knowledge base (10).

Source of obtaining knowledge: The source of obtaining knowledge is internal and external sources (10).

Type of acquired Knowledge: Type of acquired knowledge can be either tacit or explicit (10).

Activities: Activities related to knowledge acquisition are identification of knowledge, obtaining the identified knowledge, transferring the knowledge for immediately using or internalization (11).

Key point: Knowledge acquired can either be tacit or explicit but must add value to the organization (10).

Knowledge selection attributes

Purpose: The purpose of knowledge selection is Identification the knowledge according to organizational needs in internal sources, Provide knowledge at the appropriate place and by the appropriate form (12).

Source of obtaining knowledge: Knowledge is obtained from internal sources (12).

Activities: Knowledge selection activities include the following: identification of knowledge from internal sources, obtaining the identified knowledge from internal sources, transfer the knowledge for immediately using or internalization (12)

Key point: Knowledge selection is the opposite point of knowledge acquisition (12).

Knowledge capturing attributes

Purpose: The purpose of knowledge capture is to maintain knowledge in order to organizational performance improvement, ensure that knowledge available is stored for future reference (13).

Form: Knowledge captured in the form of databases or manuals (13).

Knowledge creation attributes

Context: Knowledge creation occurs through the inference or discovery from knowledge sources (12).

Purpose: Creating or producing knowledge helps organizations gain a competitive advantage by providing valuable, rare, and inimitable resources (14). Utilization of complex and discontinuous events and phenomena to Confronting recognized organizational problems (15).

Activities: Knowledge selection activities include the following: control the organizational knowledge, Control the external environment, Creation knowledge from the existing basic knowledge, Transfer created knowledge for externalization or internalization (12).

Knowledge creation place: Knowledge is produced in the Research community, Professional Councils, Ministries and governmental organizational, Transfer and innovation centers, Science communities (16).

Form: Some scientists have defined knowledge creation as a process, output, and outcome (15, 17).

Knowledge building attributes

Context: The term knowledge building first appeared in the learning sciences literature (18).

Purpose: The purpose of knowledge creation is the creation or modification of public knowledge—knowledge that lives 'in the world' and is available to be worked on and used by other people. These pursuits should advance the current understanding of individuals within a group, at a level beyond their initial knowledge level, and should be directed towards advancing the understanding of what is known about that topic or idea (19).

Steps: Knowledge building consists of the following steps: creation, testing, and improvement of conceptual artifacts (19).

Requirements: It encompasses the foundational learning, sub-skills, and socio-cognitive dynamics pursued in other approaches, along with the additional benefit of movement along the trajectory to mature education (20).

Path: Knowledge building can be considered as deep constructivism that involves making a collective inquiry into a specific topic and coming to a deeper understanding through interactive questioning, dialogue, and continuous improvement of ideas. Ideas are thus the medium of operation in KB environments (20).

Key point: Knowledge building projects focus on understanding rather than on accomplishing tasks, and on collaboration rather than on controversy (20).

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Knowledge processing: Knowledge filtering, knowledge synthesis, knowledge integration, knowledge refinement, knowledge customization.

Knowledge processing attributes

Context: Knowledge processing is a significant factor contributing to socioeconomic sustainability (21).It is a central problem of Artificial Intelligence (22).

Purpose: The purpose of Knowledge processing is to understand the relationship among data, information and knowledge and create knowledge structures (23).

Method: The knowledge processing method is Transformation of data into knowledge, changing the form of knowledge representation, deriving new knowledge from a given knowledge (23).

Steps: Knowledge processing consists of the following steps: Information storing, information retrieving, and information transferring (21).

Key point: Knowledge processing is known as the most important factor affecting economic and social sustainability, Derive value from knowledge processing (23).

Knowledge filtering attributes

Context: Knowledge filtering can be used to facilitate assimilation. Filtering tries to get the right knowledge to the right person at the right time) 24).

Purpose: Filtering is a tool to help people find the most valuable information so that the limited time spent on reading/listening/viewing can be spent on the most interesting and valuable documents. Filters are also used to organize and structure information (25).

Steps: Knowledge filtering consists of the following steps: Evaluate documents, and puts documents, which are interesting into its structured information database) 25).

Method: The knowledge filtering method is Manual filtering by people, using intelligent agents (24).

Main actors: Computer-based Approaches, publishers, editors, journalists (25).

Knowledge synthesis attributes

Context: Knowledge synthesis is the contextualization and integration of research findings of individual research studies within the larger body of knowledge on the topic (26).

Purpose: Most syntheses are conducted either for the purpose of knowledge support or for decision support (27).

Steps: Knowledge synthesis consists of the following steps: Stating the objectives of the research, Defining eligibility criteria for studies to be included, Identifying (all) potentially eligible studies, Applying eligibility criteria, Assembling the complete data set feasible including data extraction, quality appraisal of included studies, Analyzing this data set, and Preparing a structured report (28, 29).

Method: Knowledge synthesis methods are Systematic review, Realist syntheses, Narrative syntheses, Meta-analyses, Meta-syntheses, Practice guidelines, Consensus conference, or expert panel (30).

Key point: A synthesis must be reproducible and transparent in its methods (26).

Knowledge integration attributes

Context: The integration of knowledge is the process of incorporating new information into a body of existing knowledge (31).

Purpose: The purpose of knowledge integration is to determine how new and existing knowledge interacts and how existing knowledge should be modified to accommodate the new information (31).

Steps: Knowledge integration consists of the following steps: Dynamic process of linking, connecting, distinguishing, organizing, and structuring ideas about scientific phenomena (32).

Knowledge refinement attributes

Context: The knowledge refinement process is implemented as part of an organization's knowledge management efforts (33).

Purpose: The purpose of knowledge refinement is to optimize content quality (33, 34).

Steps: Knowledge refinement refers to the process of evaluating, analyzing and optimizing the knowledge object to be stored in a repository (35, 36)

Key point: Knowledge refinement effectiveness is defined as the degree to which the refinement process produces quality knowledge (37). Knowledge refinement process should positively enhance the quality of refined knowledge (37).

Knowledge customization attributes

Context: Product customization is becoming an increasingly important strategic initiative in knowledge management. Product customization impacts the knowledge management processes of knowledge acquisition, sharing, and transfer (38).

Purpose: The purpose of customization is configuring a product or service to a buyer's specifications (39). The relationships among sales, R&D, and production functions have to strengthen and the KM system has to support such a need (38).

Steps: Knowledge customization consists of the following steps: Collecting information about the customer, choosing options and/or creating new content, deliberately tailors content (40).

Key point: Customization emphasizes the user's role in specifying content; customization is a highly user-driven process of tailoring (41).

Knowledge transfer attributes

Context: The transfer of knowledge in the broadest sense refers to the flow of knowledge between and within organizations (42).

Purpose: The purpose of knowledge transfer is: decision-making, changing individual or organizational behavior, developing policies, problem-solving (43).

Perspectives about Knowledge Transfer: Health perspective, educational perspective, management perspective.

Health perspective: Use of scientific research findings to improve professional performance (44).

Educational perspective: Using generated knowledge in

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a specific context for another context (45).

Management perspective: utilization of the new knowledge for organizational behaviors (46).

Form: Knowledge transfer can be done in the form of formal and informal, planned, and unplanned (46). Planned and unplanned: Knowledge transfer as a process where knowledge is transmitted from one person to another in the form of planned or natural (47).

Formal and informal: Knowledge transfer as an informal way through networks and social interactions in the workplace or formal way in an organization (47, 48)

Level: Knowledge transfer is a macro process, at the organizational level (42).

Steps: Knowledge transfer consists of the following steps: SECI: Socialization, Externalization, Combination, And Internalization (49).

Areas: Knowledge transfer areas include: Transfer of research findings (50). Technology transfer (51). Transfer of learning, Organizational transfer. (45).

Key point: The concept of knowledge transfer is at the macro level, where knowledge is spreading across sectors, units, or subsets of an organization (42).

Knowledge sharing attributes

Context: Knowledge sharing is an activity that involves transferring or disseminating knowledge from a person, group, or organization to another.

Purpose: The purpose of knowledge sharing is discovering tools for accessing knowledge inside and outside of organizations with a view to creating more effective management and organizational system (52).

Level: Knowledge sharing can be At the Individual level and micro (53). Among researchers, policymakers, service providers, stakeholders (54).

Activities: Sharing of knowledge is entirely conscious, with a person's desire, without any obligation (53).

Place for sharing Sharing of knowledge occurs at Conferences, social media, Media relation, Scholarly collaboration networks, Journal publication (55)

Direction: It is a Mono directional process: A person's knowledge transforms into a form that can be understood, absorbed, and used by others. Bidirectional: Share information, ideas, suggestions and related organizational expertise with each other (56).

Key point: Common purpose and shared experiences between individuals, and Communication with others are taking place (56).

Knowledge exchange attributes

Context: In the exchange of knowledge, collaborative problem solving between researchers and decision-makers takes place (54).

Purpose: The exchange of knowledge is to increase the effectiveness of networks and teams in complex environments (54). The exchange of knowledge to create new knowledge (57).

Form: Knowledge exchange is an active process: Researchers make knowledge available to users, and users also transfer knowledge to researchers. It Includes knowledge sharing (what employees give to others) and knowledge search (employees are seeking knowledge from others). (57).

Direction: There are bidirectional relations between researchers or knowledge producers and users.)58).

Key point: The interactions between researchers and decision-makers take place (57).

Knowledge dissemination attributes

Means for dissemination: Knowledge can be disseminated through articles, journals, conference lectures and other outputs (59).

The type of dissemination: Dissemination of knowledge is in the form of Knowledge, interventions and existing or recent methods (59)

Direction: It is mono-directional, from the top to the bottom and from the expert (59).

Form: Knowledge dissemination is a planned process (59).

Knowledge publication attribute

Context: One of the major academic duties to share their findings, and to interact with their peers and the general populace, via literal publication (60).

Purpose: The purpose of the publication is the Making-public of new knowledge (60).

Steps: Knowledge publication includes the following steps: Find the right journal, prepare the paper, and submit the paper (55).

Form: The publication of knowledge is in the form of Letter, rapid or short communications, Review papers, Full articles, Research elements (data, software, methods, Citable articles, in brief) (55)

Key point: The publication is related to academic journals (55).

Knowledge Brokering

Knowledge brokering attributes

Context: Knowledge brokering is one of the human forces behind knowledge transfer. It is a dynamic activity that goes well beyond the standard notion of transfer as a collection of activities that helps move information from a source to a recipient (61).

Purpose: Brokering focuses on identifying and bringing together people interested in an issue, people who can help each other develop evidence-based solutions. It helps build relationships and networks for sharing existing research and ideas and stimulating new work." (62). Knowledge brokering encompasses a wide range of processes and practices that aim at establishing relationships and facilitating effective knowledge sharing and exchange (61).

Form: Knowledge brokering takes place as either formal or informal activities (61).

Type: Types of knowledge brokers are: Information Intermediary (Help Access to knowledge), Knowledge Intermediary (Help Understand and apply the knowledge), Knowledge Brokering (Help use of knowledge in decision making), Innovation Brokering (Changing Context). (61)

Activities: Knowledge brokering activities are: uncovering the needs, ideas, activities, and processes of different

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knowledge environments in order to identify the best research, practices and tools that research partners need to capture, transfer, exchange and collaborate around knowledge (61).

Key point: It engages with obstacles that block the transfer of research into practice (61).

Knowledge storing: Knowledge assimilation, knowledge package, knowledge indexing, knowledge documentation.

Knowledge storage attributes

Context: Knowledge can be viewed as an item to be stored for future usage (34).

Purpose: Knowledge storage is In order to facilitate the assimilation of knowledge (63).

Type: Knowledge is stored in the form of individual and organizational knowledge, soft or hardstyle recording and retention (49, 64)

Form: Knowledge store as the form of documents, rules, cases, and diagrams (65)

Method: Technical infrastructure such as modern informational hardware and software, human processes are necessary for storing knowledge (49).

Steps: Knowledge storage steps are: identify the knowledge in an organization, convert the identified knowledge to code, and index the identified knowledge for later retrieval (49, 64).

Knowledge assimilation attributes

Context: A critical aspect of knowledge management is that of assimilation (66, 67).

Purpose: 1. To take in and incorporate as one's own; absorb 2. To bring into conformity with the customs, attitudes, etc. of a group 3. To convert to substances suitable for incorporation.

Steps: Knowledge assimilation steps are: Storage, massaged, organized, integrate, filtered, navigate (66, 67).

Key point: Knowledge can be captured or created, but until it is assimilated it is not likely to receive extensive use (64).

Knowledge package attributes

Purposes: The purpose of the knowledge package is culling, cleaning and polishing, structuring, formatting, and/or indexing documents against a classification scheme (68).

Activities: Knowledge package activities include Authoring knowledge content, codifying knowledge into "knowledge objects" by adding context, developing local knowledge into "boundary objects" by deleting context, filtering and pruning content, and developing classification schemes (68).

Knowledge indexing attributes

Context: Knowledge index is to provide a summary about subject content; Indexing activity should be done as a pre analyzing process (69).

Purpose: The purpose of indexing is: organizing the Information in order to effectively use of information (70).

Steps: Knowledge index steps are: Review of documentation and establishment of subject matter, identify the core concept in documents, Referencing selected concepts by the terms of the indexing language (71).

Main actors: Librarian and intermediaries are the main actors for indexing of knowledge (71).

Knowledge documentation attributes

Context: Preservation and documentation are ways to ensure the future existence of indigenous knowledge, which today is under threat of extinction (72). Facilitating re¬trieval knowledge is to take place from an organized data set (WIPO, 2016).

Purpose: The aim of documentation is to ensure the maintenance, use, and development of knowledge by present and future generations of peoples and communities (73).

Steps: Knowledge documentation steps are Knowledge identification, Knowledge fixation, and Knowledge classification (73).

Methods: The methods for documentation are Paper files, digital databases, archives, or libraries (73).

Main actors: Librarian and information professionals are the main actors for knowledge documentation (74).

Knowledge transfer: Knowledge sharing, knowledge exchange, knowledge dissemination, knowledge publication.

Knowledge capitalization: Knowledge commercialization, knowledge valorization.

Knowledge capitalization attributes

Context: Knowledge capitalization is the most important part of KM (75).

Purpose: It aims at building organizational memories that represent several views on expertise or activity (75.)

Activities: Capitalization is the process by which members of the community can identify, locate, model, store, access, use/reuse, share, update, and know-how to communicate the knowledge of the community (75).

Steps: Knowledge capitalization steps are: Knowledge extraction and formalization, Knowledge sharing, Knowledge reuse and appropriation, Memory evolution (75).

Form: Knowledge capitalization happens in the form of: Knowledge locate (identifying, localizing, characterizing, mapping, estimating, prioritizing), knowledge preserve (acquiring, modeling, formalizing, conserving), knowledge enhanced (accessing, disseminating, sharing, using more effectively, combining, and creating), knowledge actualized (appraising, updating, standardizing, enriching, knowledge managed (elaborate a vision: promote, inform, train, facilitate, organize, coordinate, encourage, motivate, measure, and follow up) (76).

Knowledge commercialization attributes

Context: Commercialization of knowledge is the Third mission of the university, Transfer of knowledge to industry (77).

Purpose: The purpose of commercialization is: Decrease independency to the public sector, Make commercial profit (78).

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Direction: At the commercialization level Corporation between education and industry, dynamic improvement of production, and the economy system is taking place (78).

Steps: Knowledge commercialization steps include flowing: Idea generation, Idea evaluation, Idea development, Commercial analysis of the product, Market assessing, Commercialization (79).

Key point: Commercialization is not a linear process; it is a complex process (79).

Knowledge valorization attributes

Context: Valorization is a word of French origin translated as a "surplus value". Valorization was framed in the context of the discourse of academic capitalism (80).

Purpose: The purpose of valorization is to transfer knowledge from one part to another for economic benefit" (81).

Path: The process of knowledge valorization is a long route that starts at universities (81). Valorization not only contributes to the availability of the results of academic research beyond academia but also involves the co-production of knowledge by academics and representatives of business (80).

Types: Types of valorization are societal (social) and economic (81).

Main actors: "Valorization is a cooperation between higher education institutions, government, and business players to agree on targeted investments in a number of key areas of regional innovation" (82).

Steps: Knowledge valorization steps are: Knowledge acquisition; amassing the relevant internal and external information required for the transfer of knowledge is collected and quickly deploying this information to its potential users, Knowledge processing; assess the market value of the relevant research and package the knowledge with market potential for business requirements, Knowledge dissemination; delivering of the knowledge package to business and assisting in the technology deployment (83).

Areas: Knowledge valorization areas include: education, Cooperation, contract research, R&D cooperation, and knowledge, and technology transfer, "entrepreneurship, "the production of successful high-tech start-ups" (84).

Key point: Knowledge-Economy Index which takes into account whether the environment is conducive for knowledge to be used effectively for economic development and Knowledge Index which measures a country's ability to generate, adapt and diffuse knowledge (52). Valorization is broader than commercialization that is focused primarily on making a commercial profit (80).

Knowledge utilization: Knowledge adoption, knowledge adaptation, knowledge reuse.

Knowledge adoption attributes

Context: The adoption of knowledge is carried out in the field of innovation (46).

Purpose: Adoption is taking place in order to decision making about accept or refuse of innovation (46).

Steps: Knowledge adoption steps include: awareness about new knowledge, attitude formation, and decision about accept or refuse of innovation or new knowledge, implement a new idea or confirm accepted decision (46).

Key point: User motivation for use or rejection, resistance rate about new knowledge, consistency to the policy is determining factors in the knowledge adoption process (85).

Knowledge adaptation attributes

Context: The adaptation of knowledge is related to the results of the research, and this step is critical to the success of the knowledge transfer process (86, 87).

Purpose: The goal is to make the results accessible and understandable by the users (86, 87).

Key point: This step affects the user's decision to accept the knowledge generated by the researchers. Also, the availability of research results does not necessarily guarantee acceptance and use by users. Many authors have argued that the form of presentation of research results can be a motivation or obstacle to accepting knowledge in the educational community (87).

Knowledge reuse attributes

Context: It is a central issue for companies in order to avoid reinventing the wheel over and over again (89). The effective reuse of knowledge is arguably a more frequent organizational concern and one that is clearly related to organizational effectiveness (89).

Purpose: Knowledge reuse is taking place for sharing best practices or helping others solve common technical problems (88).

Steps: Knowledge reuse steps include: Capturing or documenting knowledge, packaging knowledge for reuse, Distributing or disseminating knowledge (providing people with access to it), and Reusing knowledge (35).

Activities: Knowledge reuse activities are followings: recall (that information has been stored, in what location, under what index or classification scheme) and recognition (that the information meets the users' needs), as well as actually applying the knowledge (90).

Agent: There are three major roles in the knowledge reuse process: knowledge producer—the originator and documenter of knowledge, who records explicit knowledge or makes tacit knowledge explicit, knowledge intermediary—who prepares knowledge for reuse by eliciting it, indexing it, summarizing it, sanitizing it, packaging it, and who performs various roles in dissemination and facilitation, and knowledge consumer—the knowledge reuser, who retrieves the knowledge content and applies it in some way (91).

Key point: Successful knowledge transfer or reuse requires a complete solution. It is not just a matter of providing access to information technology and repositories. It also means careful attention to the design of incentives for contributing to and using repositories and to the roles of intermediaries to develop and maintain repositories and to facilitate the process of reuse (89).

Knowledge translation attributes

Context: The translation is the process of putting research findings and the products of research into the hands

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of key audiences. It is the art of weaving together processes of research and practice (92).

Purpose: Knowledge Translation is impact-oriented- the overarching goal of KT is to improve systems, practices, and ultimately lead to better outcomes (93).

Activity: Knowledge Translation includes multiple activities- Researchers need to go beyond mere dissemination and publication of results to multiple engagements to effect knowledge uptake (93).

Direction: Knowledge translation is a nonlinear process- it is also a complex process with multiple players, it also needs multidirectional communications (93).

Agent: Knowledge translation is an interactive process- the interactions between knowledge producers and knowledge users should be continuous. KT requires ongoing collaborations among relevant parties- collaboration, relationships, and trust among parties (92).

Steps: Knowledge translation includes all steps between the creation of new knowledge and its application (93).

Key point: It emphasizes the use of research-generated knowledge (93).

Knowledge management attributes

Context: Knowledge management is the process of transferring information and intellectual assets to a stable value. And it is related to making knowledge suitable for the correct processor, such as a human being or a computer, at the right time and at the right cost (94).

Purpose: The purpose of knowledge management is to create the knowledge that can be used by more than one person, for example, for the organization as a whole, or sharing knowledge between its members (94). Help to promote the use and sharing of data and information in decision making (95).

Activity: Knowledge management involves planning, organizing, and controlling individuals, processes, and systems to ensure that knowledge capital is promoted and applied effectively (33).

Type: Knowledge management has multidisciplinary nature, which includes: organizational science, cognitive science, information technology, linguistics, technical writing, ethnology and sociology, teaching, Communication studies, collaborative technologies such as computer-based collaborative activities, intranets, extranets, portals, and other network technologies (96).

Path: Under the knowledge management, the information becomes applicable to the knowledge and is applicable to the people who can use it (97).

Steps: Knowledge management steps involve: obtaining, organizing, managing, and disseminating knowledge in an organization in order to perform tasks faster, reuse best practices, and reduce costs twice (49). The process of finding, selecting, organizing, importing, and providing information in order to help raise the understanding of employees in a particular area (98).

Form: Knowledge management has two main aspects: knowledge as an obvious concern that reflects on organizational strategies, policies, and practices. On the other hand, it takes into account the relationships between intellectual capital (both apparently recorded and implicit in the form of personal knowledge) and Positive business results (99).

Discussion

Studies have examined one or a few concepts in the field of knowledge management. Through this study, we were able to investigate all of the concepts related to knowledge management as far as possible. By criticizing and comparing the evidence and definitions relating to them, based on semantic proximity, we divided them into related categories and, clarify the boundary among them. We realized that many concepts had not found their appropriate place in the KM process, and there are no proper definitions of them. Therefore, it is necessary to redefine some of the concepts and the correct placement in the structure and operation of knowledge management. We can use the results of this study as the basis and the first step in developing a comprehensive model that includes all the concepts related to knowledge management and for determining the relationship among them and with other educational development concepts.

Conclusion

This study aimed to clarify the concepts in the knowledge management area. Through critically reviewing the literature in this field, we were able to identify the concepts and realize their attributes. Therefore, we came to a new interpretation of the concepts. At the end of the study, we concluded that some of the concepts have not been properly defined and are not properly located in the knowledge management field, and their application is uncertain. Regarding the identified gaps, there is a need to comprehensively study that consider all of these in the direction of knowledge management, show their application in a comprehensive model and, if necessary, redefined them, such as study can complement our work.

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Conflict of Interests

The authors declare that they have no competing interests.

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