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CO-WORD ANALYSIS: A STUDY ON LEXICAL SHARING BETWEEN SUSTAINABLE DEVELOPMENT AND KNOWLEDGE MANAGEMENT

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ABSTRACT

Sustainable development is a process that ought to be in harmony both with current and future needs regarding exploitation of resources, direction of investments, orientation of technological development, and institutional changes. It is an aspect of human development that aims to expand human capabilities. Development of human capabilities, together with social and cultural maturity of humans, is due to knowledge and information. Therefore, in order to achieve sustainable development, distribution of knowledge across all social strata is emphasized. Furthermore, O'Dell and Grayson (1998) define knowledge management as a strategy of distributing knowledge among people and organizations and ensuring that right knowledge will be available to the right people at the right time. A brief study of texts reveals that there are NOT common lexical boundaries between sustainable development and knowledge management. Thus, in order to assess the co-word frequency between the two concepts, the present article used co-word analysis to explore words common to PNU undergraduate texts in sociology, particularly sociology of development and library and information science, with regard to knowledge management. The resultant graphs show that there is no lexical sharing between the two concepts. Another purpose of this study was to extract the common keywords.

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INTRODUCTION

The era in which only money, land and strength of arms, were known as the capital, has come to an end. Knowledge, nowadays, is one of the most important human capitals being in people's minds. Unlike other resources, knowledge is infinite. When used more, it will be increased. In the age of knowledge where knowledge is one of the most important capital is the human being. In the age of wisdom, knowledge is one of the most important capitals of the human societies. As a result, societies require different management approaches to preserve, transmit and distribute knowledge. The approach of knowledge management strategy focuses on people as sources of knowledge. Knowledge management tries to reveal intangible and implied assets. For example, Davenport and Prusak believe that knowledge is derived from the people and is located in the minds of people. In another definition, Amin and colleagues state that knowledge management is the process and technologies for capturing, sharing and using collective knowledge in order to make optimal decisions at the right time. O'Dell and Grayson also believe that knowledge management is a strategy that should be developed in an organization to ensure that the knowledge reaches the right people at the right time and those people share the knowledge and information to improve the performance of their organizations [1]. According to the definitions provided in the field of knowledge management, theorists in the field realize the issue of sharing and distributing of knowledge as the essential issue and one of the key points in the approach of knowledge management. However, as defined by the World Bank (2003), knowledge assets, are the most important ingredients of the development and knowledge is a developmental tool [2]. The current Societies regard knowledge as the foundation for their development and attempt to share and distribute it; in the issue of access to distribution strategies in the context of cultural knowledge and its sharing with communities

we are faced with the fact that the most successful Societies are the most developed ones. Development, including individual, group and national, is a multi-directional process that changes functionally in society, culture, economy, politics, management, and environmental aspects of a nation in the micro and macro levels [3]. The common term of "sustainable development" also has its own definitions, such as the concept of sustainable growth and successful development. A more general definition of the concept of sustainable development can be acquired from the World Commission on Environment and Development. The report suggested a set of legal principles to achieve sustainable development for developing countries: "Sustainable development as a process, is necessary for improvement. It is the basis for improvement of conditions and elimination of the social and cultural shortcomings". Perhaps, among the definitions of sustainable development, this definition is the best one: "Sustainable development requires continuous supplies and increase in individual satisfaction with the quality of human life". Thus according to the definitions, we may state that: "Sustainable development is a process that is the basis and prerequisite for progress; it is without destructions and risks and focuses on all economic, social, cultural and environmental aspect. [4]". When one talks of sustainable development, s/he means a development that regards human survival and complete prosperities. The principle of Connection is very important in sustainable development and is in an interaction with the whole chains of dynamic processes, human resources, natural resources and the hardware system of community; it attempts to create the present and future interaction between man and nature, justice, and prosperity within and between generations [5]. Nowadays, societies are trying to reach out and establish a society based on sustainable development indicators. One of the components of sustainable development is the equitable distribution of benefits. In general, the situation of the sustainable development is favorable and based on the data-driven character of contemporary societies, we cannot overlook the elements of fair distribution and knowledge. Accordingly, in order to achieve sustainable development, different strategies about the sharing and distribution of knowledge in the field of knowledge management have been created. [4]. And this indicates that the interaction between the two fields of knowledge management and sustainable development, is bilateral but certainly each of them has its own functions and components. For this reason, understanding the concepts used in these two areas and determining their relevance or combination is important. So that the experts of these two fields would be able to closely consider the impacts and roles of each field on the other.

What is the co-word analysis?

One of the issues discussed in this article is the extraction of common key words of both fields of sustainable development and knowledge management which is associated with the term co-word analysis. So this analysis needs to be elaborated. In fact, co-word analysis is a science technique through which we can identify conceptual relations between scientific domains and studied texts and documents and in this way, we may achieve the relationship between ideas in the subject areas. The co-word analysis is based on the assumption that areas of research can be considered through the patterns used in publication words. In this index, the key words in the title, abstract or text documents are checked. Also, the co-occurrence of Keywords, shows the cognitive Connection between the event and a set of documents. This method was developed by Courtial, Callon and Turner in the 1980s, as an alternative to citation and co-citation approaches used in realization of sciences.

Co-occurrence of two or more than two terms in a document or in different documents, is the criteria for action; Words may be descriptor keywords or words in context. This approach is based on three assumptions: a) the words used in the scientific literature are carefully chosen by the authors, b) The use of different words in the text requires some non-trivial relations between the words, c) Repetition of the co-occurrence of words in the texts by different authors, means that the relationship between these words is important in the studied science. This method is used as a measure to determine the most important research topics in areas of science, with a focus on high-frequency words; the frequency of a word is considered as an indicator of the importance of attention or emphasis on the word or idea. [6] Some concepts are used in explaining the knowledge management and sustainable development which can be linked with a quantitative studies and determine their limit to a certain extent.

Objective: The aim of this study is to determine the relationship of words or their limits quantitatively between two areas of knowledge management and sustainable development. Or in other words to what extent the two areas share concepts. Since knowledge and its management are among the basic components of developed (according to the World Development Report) we want to show that to what extent the researchers have referred to sustainable development and knowledge? So three questions will be answered in this study:

1. What are the basic concepts of the field of sustainable development in articles?
2. What are the basic concepts of knowledge management in articles?

3. What are the shared used concepts from the perspective of the authors of books and articles in two areas of knowledge management and sustainable development?

Literature review

Subject searching on the website of the National Library of Iran was conducted to find authored or translated books in the field of sustainable development and knowledge management, however, the result was not satisfactory. Also searching in the databases for shared articles regardless of publication period in the field of sustainable development and knowledge management was done, the websites were: Noormags Database (http://www.noormags.ir/), Scientific Information Database (SID) (http://sid.ir) , Comprehensive Human Sciences Portal (http://www.ensani.ir) and Iranian Research Institute for Information Science and Technology (http://www.irandoc.ac.ir/). These searches showed that only two articles have been written in Iran in the field of sustainable development and knowledge management that investigate the impact of these two fields on one another. But the discovering of the conceptual relationships, clustering and creating scientific maps, have been done in different fields of research with the method of co analysis. Among them, Kokabi and Ahmadi (2014) determined the relationship and boundaries between knowledge management and information management; their results have shown that the shared terms in knowledge management and information management are in a very low level. Through co word analysis and clustering, investigated IT management in Iran for the purpose of evaluation, policy and mapping of the area and compared it with the global situation. Their results suggested that the distribution of knowledge in the main sub fields of this course in Iran, has been uneven.[7]

METHODS

In the co words analysis, the counting of the Keywords is done in three scientific ways: 1.a thesaurus is used containing each set of words with definitions and relationships between them, 2. indexing documents is used through which a series of texts are considered and indexed, 3. Using keywords and concepts of the creators of documents. The population of this study consists of 8 books from library books and 300 articles of Payam Noor University of Tabriz in knowledge management and sustainable development. Total documents including books and articles in two areas are equal, and are in Persian.

The first step: four books in the field of sustainable development in sociology with a volume of approximately 1,000 pages and 4 books on knowledge management from information sciences with an approximate volume of 700 pages were evaluated and discussed.

The Second step: At this step, definitions and theories presented by the theorists of the areas were considered and fundamental keywords were extracted; the content of books were analyzed and the key words were extracted. 154 keywords in the field of knowledge management and 276 keywords in the field of sustainable development were extracted.

The third step: After reading books and extracting key words, the authors of books in the field of knowledge management, frequent keywords in the field of knowledge management and sustainable development were identified which are stated in the table below.

Table: 1. Basic concepts used in the books on teaching basic concepts of knowledge management

1 - shared interests	19. Joint capital	38. - Strategy
2. Knowledge sharing	20. Performance	39. The knowledge-based organizations
3. Communication Networks	21. Development of Assets	40 - Knowledge
4. Knowledge intermediaries	22. The source of economic development	41 competitive organizations
5-cultural knowledge	23. Knowledge Creation	42 - Communication Technology
6. Share knowledge	24. Intellectual Property	43 -Competitive stable
7. Data	25. tacit knowledge	44. competitive advantage
8. The effective transfer of knowledge	26. Explicit knowledge	45. software movement
9. Knowledge Transfer	28. Organizational Intelligence	46. Librarians
10. Sharing of knowledge	29. Economic Development	47. Information
11. Dissemination of knowledge	30. Knowledge workers	48. Technology
12. Distribution of knowledge	31. strategic decisions	49. Information Technology
13. The rapid and effective cooperation	32. solving systematic issues	
14. Effectiveness	33. The decision of knowledge	
15. The sharing of information.	34. Trust	
16. Leadership		

17- effective management 18. Culture	35. Evaluation 36. strategic assets 37. Knowledge Management	

Table: 2. The basic concepts used in the books on teaching basic concepts of sustainable development

1. Literacy 2. Health 3. Training 4. Development Indicators 5. Income 6. Life expectancy 7. Stability 8. environment 9. Cycle Technology 10. planning needs 11. Globalization 12. Planning 13. Collaboration 14. The consensus orientation 15. Urban Development	16. Security 17 - Human Development 18. Inequality 19. Gender Equality 20. Tourism 22. Culture 23. sustainable rural development 24. Sustainable Urban Development 25. Rural Development 26. Social relations 27. Globalization 28. System 29. Economics	30. Discipline 31. tolerance 32. Intangible public service 33. Social Solidarity 34. Social capital 35. Entrepreneurship 36. human skills 37. Education for Sustainable Development 38. Environmental Ethics 39. The commitment 40. Social changes 41. Poverty and unemployment 42. Sri natural source 43. Citizens' Rights 44. Liberalism 45.Developmentalism	46. Sustainable economic value 47. Local Governments 49. triangle Contributions 50. Social survival 51. Social issues 52. The segregation of class 53. Tourism 54-market 55. The stable revenue 56. Cultural changes 57. Financial Systems 59. specialization 60. Human Rights 61. Urbanization

Then the extraction of keywords of articles started and after analyzing it was identified that the frequent keywords of articles are the basic concepts of studied books.

RESULTS

Results and analysis of data

Determination of the keywords used in any science is one of the ways through which we can identify the fundamental concepts of each scientific field. So the question 1 and 2 of the study were presented to identify the fundamental key words used in the two fields.**First question: What are the basic concepts of the field of sustainable development in the papers?**
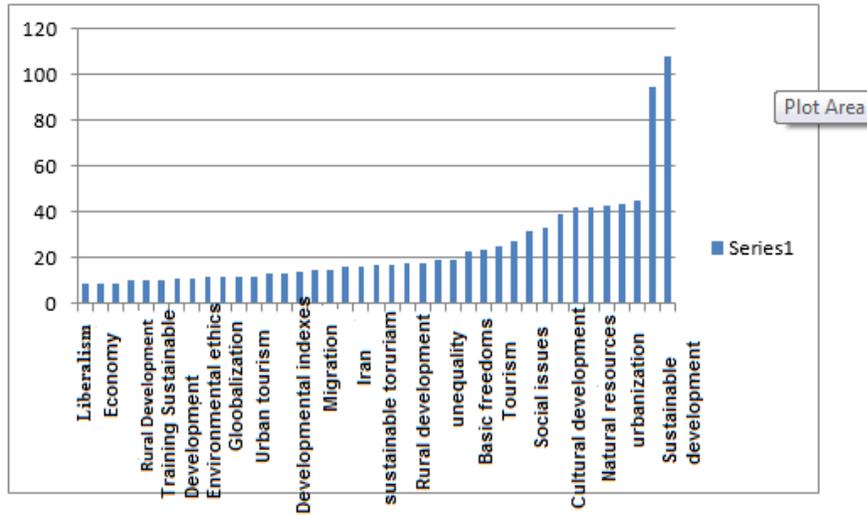
Fig 1: most frequent keywords used in articles in the field of sustainable development

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194 words out of 276 keywords related to sustainable development had a frequency of 1 or 2. This indicates that these are the least important ones in the prepared sample. Out of the remaining 62 cases, 17 cases had a frequency of 3 or 4. Based on the sample size still it can be said that these cases didn't have had a considerable frequency.

Keywords with a frequency of 9 are considered high frequent including 20 Keyword. These key words, are the basic concepts related to sustainable development issues and have being used in the papers in this field; among these key words the following are more high frequent: requirements of planning, sustainable development and development. Due to the frequency of key words it seems that the most general and basic concepts have been regarded by writers of these articles. It can be deduced that the papers have only considered general topics and issues of sustainable development and have not investigated the problems precisely and experimentally.

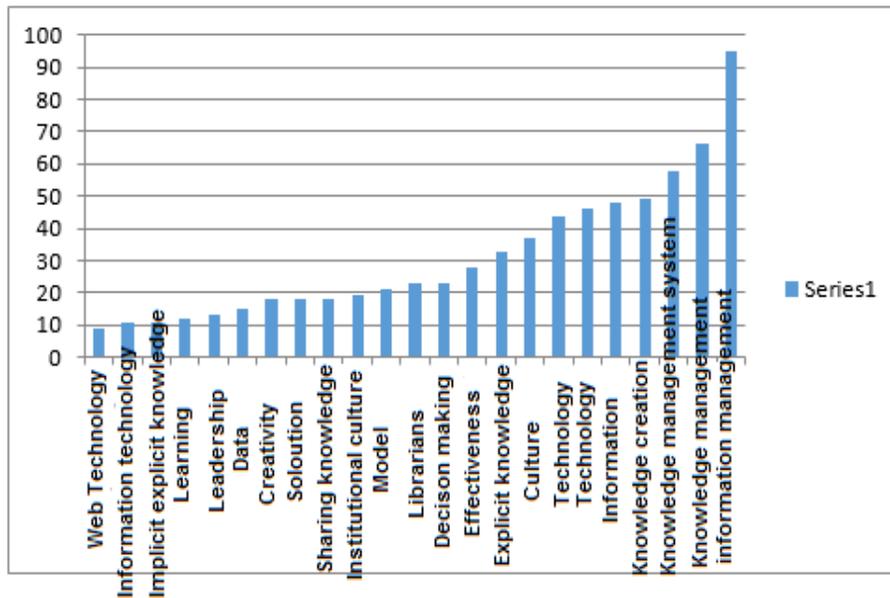**The second question: what are the basic concepts of knowledge management in articles?**

Fig2 : the most frequent keywords extracted from articles in the field of knowledge management

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As the fig2 shows, in the field of knowledge management, 23 Keywords out of the 154 words are the most frequent concepts and authors have pointed out to them. All Keywords can be are related to the basic concepts of

knowledge management and management, and there is no keywords that indicate the experimental studies of the researcher.

The third question: What are the shared used concepts from the perspective of the authors of books and articles in two areas of knowledge management and sustainable development?

Basically for determination of the shared keywords of two fields, the use of matrix mapping and co-occurrence software are required which are designed to be used in the field of scientometrics. An example of such software, is the software of bibexcel.exe. It is a bibliometric tool being developed at the University of Umea of Sweden. This specialized tool is created for bibliometric data management and making maps that can be compared with software such as Excel, SPSS, USI note, and PJAK. [8]. But the meta-analysis of the articles showed that there is no shared keywords in the field of sustainable development and knowledge management. Also no connection was observed between sustainable development and knowledge management; thus, this study didn't use the software in the case study. But to measure and achieve more accurate results, this study should be performed again on a wide scale.

RESULTS

in this study, the basis for the frequent vocabulary number was (9). The frequency of keywords extracted from articles and books, in two areas of sustainable development and knowledge management and the data review showed that a relatively large number of keywords are shared in two subject areas; authors have used them as keywords of sustainable development and knowledge management (276 cases In the field of sustainable development and 154 cases in the field of knowledge management). But according to the number of keyword's frequency only 20 keywords in the field of sustainable development and 23 keywords in the field of knowledge management were identified. The authors have used them with high frequencies of 9 and actually have regarded them as the most fundamental concepts in the field. What is significant is the overlapping of frequent high Keywords in these two areas and the extracted key words of the books. These words are mentioned in table1 and table 2. The overlap of the high frequency key words used in articles and basic concepts extracted from the books indicates that authors have only discussed the basic concepts in the field of sustainable development and knowledge management and have not considered the advanced discussions in their articles. However, as stated previously in order to achieve accurate results, the research must be done on a larger scale.

DISCUSSION

Professor "Frederick Harbison says: "Human resources constitute the main foundation of national wealth, capital, and natural resources. Humans are active agents who aggregate capital, exploit the natural resources, socio-economic and political organizations and move forward national developments. Clearly, when a country is not able to develop the skills and knowledge of its people and exploit the economy effectively fails to develop anything." [9]. Also, according to the Outlook of the Islamic Republic of Iranin 2025 one of the clauses concerning the development of the country is obtaining advanced knowledge, capability in science and technology, based on human resources and social capital in the national production. [10]. In accordance with human development's indicators which are presented each year since 1990 by the World Bank, knowledge is considered as one of the components of and human indicators of development (HID) [11]. The main objective of the research is the extraction of shared Keywords of sustainable development and management and creating the scientific map of shared words in these two fields. Meta-analysis showed no shared keyword in these two fields, meaning that researchers of sustainable development and knowledge management have not regarded the sharing of keywords as a requirement for sustainable development in Iran. No connection between sustainable development and knowledge was identified, so the study didn't use software bibexcel.exe. for the determination of co-occurrence of words

CONCLUSION

The hypothesis that the use of knowledge improve the results and achievements is postulated in individual and collective human behavior. The issue of development is one of the key issues of countries in today's world. The concepts of knowledge and training exist in almost all indicators of development in modern societies. According

to the results of the research and the importance of development it is proposed that the authors of books and articles seriously review the issue of sustainable development and knowledge and through applied and basic researches overcome the shortcomings of these two areas.

CONFLICT OF INTEREST
Authors declare no conflict of interest.

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FINANCIAL DISCLOSURE

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