



## Identification and ranking of factors affecting investment in intellectual capital in educational institutions of North Khorasan Province by AHP method

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### ABSTRACT

The aim of this study was to identify and rank the factors influencing investment in intellectual capital in North Khorasan Province Education Department was using AHP. The research method used descriptive, correlational respectively. The research data were collected by library and field methods and tools used were a questionnaire. The reliability and validity of the questionnaire using Cronbach's alpha was confirmed by content. The test data analysis using the software Expert Chykh AHP and Excel is used. The results obtained show that The factor of investment development in intellectual capital with a relative weight of 0.513 was ranked first, and after that, the factor of maintaining investment in intellectual capital with a relative weight of 0.298 was in the second place and creating investment in intellectual capital with weight The relative 0.186 is ranked third.

*Keyword:*

**Investment,  
Intellectual Capital,  
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## Introduction

In a knowledge-based economy, products and organizations live and die based on knowledge, and the most successful organizations are those who use this intangible asset more efficiently and quickly. Studies have shown that, in spite of lowering the returns of traditional sources (such as money, land, machinery, etc.), knowledge is really a source of increased business performance. From the strategic point of view, today intellectual capital is used to create and increase knowledge and organizational value, and the success of an organization depends on its ability to manage this scarce resource. In this research, the identification and ranking of factors affecting investment in intellectual capital in educational institutions of North Khorasan Province has been investigated by AHP method.

## Statement of the problem

The existence of several definitions of intellectual capital and the lack of a comprehensive definition of it, as a result of its reporting (Abiaskara, 2013), has led each researcher to define this term from his point of view and on the basis of experimental and experimental models. (ABISKRA, 2008). But in general, intellectual capital is an obscure and complex term, and only when it is understood and exploited, it can provide a new source base through which the organization can compete (Bontis, 1996). Intellectual capital includes all processes and assets that are not usually shown on the balance sheet and also include all intangible assets (such as trade marks, the right to register and operate products and names Commercial) that are considered in modern accounting methods. Intellectual capital is the sum of knowledge of the members of the organization and the application of their knowledge (Rus et al., 1997). But one of the new definitions given in this context is the definition of Zagal and Malcolm (2014).

They defined intellectual capital as the whole knowledge that an organization is able to use in the process of directing its business in order to create value for the company. All studies on intellectual capital attest to the fact that there is no one-dimensional structure in this field. And intellectual capital at various levels such as individual, intra-organizational, and outsourcing. As a result, intellectual capital is not limited to the knowledge available to individuals, but also includes knowledge stored within organizational databases, business processes, and communications.

Therefore, different classifications have been presented in this regard. In this study, the present study examined the classification of Russia and colleagues (1997), they explained that their views on intellectual capital were knowledge-based And there are similarities with the subject of knowledge. They split the structural and human capital from intellectual capital, and they represent the blind and uninformed sources, which inevitably require each of them different management practices.

Today we see organizations that use new business models and grow and compete using resources that are different from the past. In a knowledge-based economy, products and organizations operate on the basis of knowledge, and the most successful organizations are those. Which make this intangible asset more efficient and faster. From the strategic point of view, today, intellectual capital is used to create and

increase organizational value, and the success of an organization depends on its ability to manage this scarce resource. This important organizational capability can provide sustainable competitive advantage over other organizations.

Researchers believe in the benefits that all stakeholders, organizations, employees, managers, investors, and government believe in through the acceptance of intellectual capital as a source and through its performance appraisal (Polic, 2004; Chen et al., 2005). Researchers believe that intellectual capital is a leverage to maintain a stable competitive advantage. As a result, identifying, evaluating and managing intellectual capital is very important for governmental and nongovernmental organizations and organizations (Chang, 2014).

The question here is how can organizations, especially education departments, recognize the potential provided by intellectual capital and use it to create the benefits of sustainable competition? In other words, the purpose of this research is to create and create a sustainable competitive advantage of the organization, given the impact that intellectual capital structures have on it. The nature of most of the work done so far has focused on an aspect of intellectual capital structures, or the impact of intellectual capital on the financial performance of organizations has been taken into account. While this research specifically addresses the identification and ranking of factors affecting investment in intellectual capital in the educational institutions of the North Khorasan Province, the AHP methodology.

## Hypotheses

First question: Identify and rank the factors affecting investment in intellectual capital, including: investing in intellectual capital, investing in intellectual capital, and developing investment in intellectual capital?

Second question: Identifying and ranking the factors affecting investment in intellectual capital under the subset How to invest in intellectual capital?

Third question: Identifying and ranking the factors affecting investment in intellectual capital under the fundamentals of investing in intellectual capital?

Question Four: Identifying and Ranking Factors Affecting Investment in Intellectual Capital Sub-Funds How to Develop Investment in Intellectual Capital?

## Type of research method

This research is, in terms of its nature and purpose, of the type of applied research. An applied research is an attempt to address a problem and scientific problem that exists in the real world (Khaki, 1382: 94). And in terms of data collection, it is a descriptive survey.

## Information gathering method

The method of data collection was carried out in two ways: library and field studies.

## Information gathering tool

In this research, the questionnaire is used as a research tool in relation to the subject matter and the research method that is a survey. In this research, a standard questionnaire based on the research components has been used to measure the variables of the research.

## Information analysis method

The method of analyzing data and information in this research is as follows:

1. Descriptive statistics were used to estimate the central characteristics and to determine the frequency distribution tables.

2. The statistical test method (community satisfaction ratio test), Fisher's test and one-factor variance analysis, so that the difference between the average components of the comprehensive ranking model can be assessed and prioritized. The mathematical model is designed to identify and rank the factors affecting investment in intellectual capital in educational institutions of North Khorasan Province using the AHP model.

**Statistical population, sample size and sampling method**

The statistical population in this research is the directors and assistants in the education departments of North Khorasan Province, which is 30 people.

The statistical sample of this research is directors and assistants in the education departments of North Khorasan Province with 30 people and the sampling method has been selected by a total number of methods.

**Test the hypothesis of the research**

The procedure for this research, based on the concept of AHP, has been based on two basic steps.

Step 1: Identify and rank the factors affecting investment in intellectual capital based on the AHP model (Hierarchical tree design of AHP). The research problem.

Step 2: Calculate the weight of the main factors (level one)

Table 4.1 Integrated matrix (geometric) Group 1 pairwise comparisons

Investment in Intellectual Capital	B1	B2	B3	Weight
B1	1	2.266	2.166	1.810
B2	0.441	1	2.10	1.180
B3	0.461	0.476	1	0.645
IR=0.07<0.1				

The results of the analysis of Table 1.4. The weight of the main factors indicates that the factor of investment development in intellectual capital with a relative weight of 1.810 in the first rank After that, the factor maintaining investment in intellectual capital with a relative weight of 1.180 is in the second place and the factor of investment development in intellectual capital with a relative weight of 0.645 is in the third rank.

Table 4-4. Integrated matrix (geometric) Group 1 pairwise comparisons

Investment in Intellectual Capital	B1	B2	B3	Weight
B1	1	2.266	2.166	1.810
B2	0.441	1	2.10	1.180
B3	0.461	0.476	1	0.645
IR=0.07<0.1				

The results of the analysis of Table 4-4, calculated by the weights of the sub-factors, indicate that the new knowledge factor with a relative weight of 1.999 was ranked first and then the factor of participation with a relative weight of 0.949 in the second rank and the new markets with a relative weight of 0.724 in the third place contract.

Table 4-6. Integrated matrix (geometric) Group 1 pairwise comparisons

Maintaining investment in intellectual capital	B1	B2	B3	Weight
B1	1	0.333	2.166	1.166
B2	3.003	1	2.066	2.023
B3	0.461	0.484	1	1.945
IR=0.07<0.1				

The results of the analysis of Table 4-6 calculated by the weights of the sub-factors indicate that the controller with the relative weight of 2.023 was ranked first and then the customer loyalty program factor with the relative weight of 1.945 in the second rank and the factor of developing professional skills with The relative weight of 1.166 is ranked third.

Table 4-8 - Integrated matrix (geometric) Group 1 pairwise comparisons

Investing in Intellectual Capital	B1	B2	B3	Weight
B1	1	2.20	0.333	1.177
B2	0.454	1	1.20	0.884
B3	3.003	0.833	1	1.612
IR=0.07<0.1				

The results of the analysis of Table 4-8 calculated the weights of the sub factors indicate that the factor of the sources of information technology with the relative weight of 1.612 was ranked first and then the factor of recruiting personnel with a relative weight of 1.177 in the second rank and the factor of marketing activities with a relative weight of 0.884 Third place is important.

**Discussion and commentary**

In this research, the AHP method has been used to rank the factors affecting investment in intellectual capital in educational institutions of North Khorasan Province. Mohammadi (1393) In a research entitled Identification and Prioritization of Factors Affecting Intellectual Capital Management at the Trade Bank of Zahedan. To collect information, this research has been used from field research and a questionnaire that has been extracted from the main questionnaire. The validity and reliability of the questionnaire are also confirmed. The statistical population of this study is all managers and experts of the Bank of Commerce, all of which were studied. Analytical Hierarchy Process has been used to analyze the data. Exprt selection software is used for this purpose. The findings of the research showed that the abilities, knowledge and skills in the first priority and the common conditions were in the top priority. The results show that among the three main components, human capital is at the top of the list, that is, more investment in this field should be made, and structural capital is placed in the top priority. Among all the identified

indicators, abilities and knowledge in the first priority and the common conditions were the top priority.

Extract (2013) The use of intellectual capital approach in order to enhance the sustainable competitive advantage in public libraries of Khuzestan province. This research seeks to create and create sustainable competitive advantage based on the impact of intellectual capital in public libraries in Khuzestan province. The statistical population includes 200 librarians, employees and middle managers of public libraries of Khuzestan province. The intellectual capital structures investigated in this research include human capital, structural capital and capital. According to the analysis of the data from the research With the use of spss and lisrel software, the positive and significant impact of human capital on structural capital, structural capital on capital, relationship capital, and the relationship between capital and human capital were confirmed, but the only positive effect was Significance of relationship capital on sustainable competitive advantage was not confirmed.

Axana and Lapina (2014) in a research titled "Factors Affecting Investment in Intellectual Capital." The purpose of this research was to rank the influential factors in investing in intellectual capital. For data gathering, this research has been used for field studies and questionnaires. The validity and reliability of the questionnaire have been confirmed.

In this research, three main components of investment in intellectual capital were investigated. . Betinet et al. (2011) In the article, the impact of intellectual capital on the competitive advantage of organizations has a positive and significant impact on the three important structures of intellectual capital, such as human capital, structural capital, and capital, on the competitive advantage. Mamon et al., In a 2009 study titled Human Capital as a Source of Competitive Advantage, came up with the idea of strategic leadership. From human capital as the main source of competitive advantage. In a paper titled "Influence of intellectual capital on satisfaction and maintenance of conceptual model employees", Lango et al. (2011) acknowledged the positive and significant impact of human capital on structural capital. Also, in 2006, Martinstores in an exploratory study attempted to design a capital investment model, one section of which illustrates the positive impact of these two structures on intellectual capital.

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