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Araştırma makalesi

# The Impact of Intellectual Capital on Unlimited Improvement: A Research in Libyan Public Universities

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**Abstract**

This Study aimed to demonstrate the impact of intellectual capital on unlimited improvement. And it is a field study on public Libyan universities, with a number (20) universities. And towards that goal, a questionnaire had been designed which was distributed on the (6) universities of the study sample, and out of 320 distributed questionnaires several 295 were retrieved and only about 281 questionnaires were valid for analysis. The findings were analysed in the SPSS 23.0 program.

As a result of the study, there is a significant effect of intellectual capital with its dimensions (human capital, structural capital, relational capital) on the applying of unlimited improvement.

**Key words:** Intellectual Capital, Human Capital, Structural Capital, Relational Capital, Unlimited Improvement.

**JEL Code:** M11

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**Entellektüel Sermayenin Sınırsız İyileşmeye Etkisi: Libya Devlet Üniversitelerinde Bir Araştırma**

**Özet**

Bu çalışma, entelektüel sermayenin sınırsız gelişme üzerindeki etkisini göstermeyi amaçlamıştır. Bu çalışmada yirmi (20) üniversitenin bulunduğu devlet Libya üniversiteleri üzerine bir saha araştırması yapılmıştır. Ve bu amaca yönelik olarak, çalışma örneğinin (6) üniversitesine dağıtılmış bir anket tasarlanmış ve 320 dağıtılmış anketten 295'i geri alınmış ve sadece yaklaşık 281 anket analiz için geçerli olmuştur. Bulgular SPSS 23.0 programında analiz edilmiştir.

Çalışma sonucunda entelektüel sermayenin boyutları (beşeri sermaye, yapısal sermaye, ilişkisel sermaye) ile sınırsız iyileşmenin uygulanması üzerinde önemli bir etkisi olduğu belirlenmiştir.

**Anahtar kelimeler:** Entelektüel Sermaye, Beşeri Sermaye, Yapısal Sermaye, İlişkisel Sermaye, Sınırsız İyileşme.



**Jel Kodu:** M11

## 1. Introduction

Intellectual capital is an important requirement for the application of TQM within the organization, which requires attention and interest in all its aspects, starting with testing and placement, job placement, performance evaluation, continuous training programs and unlimited improvement of all levels according to the type of skills and behavioral knowledge required for each level. This study has important implications for academic leaders in universities. It motivates them to invest in intellectual capital and to achieve business excellence through unlimited improvement.

Considering the importance of intellectual capital and unlimited improvement and their impact on the ability of universities to survive and continue. The study problem can be formulated by asking the following question:

Is there the impact of intellectual capital (human capital, structural capital, relational capital) on applying unlimited improvement in Libyan public universities?

## 2. Theoretical Framework

At the start of the 21st century, many of the authors have argued that knowledge and intellectual capital plays a fundamental role in modern

organizations of a knowledge-based economy (Bontis et al., 1999; Edvinson & Malone, 1997; Edvinsson, 2000; Sudarsanam et al., 2003; Roos & Roos, 1997). In the words, intellectual capital is becoming more significant in determining the performance of enterprises in today's global economic system (Hsu & Fang, 2009; Bontis, Keow, & Richardson, 2000).

The intellectual capital is one of the most important topics that has attracted the interest of researchers as it represents a strategic presence of the organization and its real wealth. It is the source of creativity and innovation as well as an indicator of its economic performance and a sign of its success, excellence and continuity (Ghorbani et al ., 2012) **.** Where the economist Galbraith (1969) was the first to propose the intellectual capital concept and described intellectual capital as a behaviour that requires the exercise of the brain (Huang & Wu, 2010). Despite this importance, there is no agreement among the researchers on a uniform definition of it, according to Hunter et al (2005)**,** intellectual capital is conceptualized as an intangible resource that can generate value in future. Edvinsson (2000) suggests that all the information that can be converted into something valuable is intellectual capital. According to Bontis et al (2000), intellectual capital means individual employees and organizations' knowledge that contribute towards sustainable competitive advantage.



At the universities level, intellectual capital refers to all intangible assets of educational institutions that include processes, capabilities, creativity, patents as well as the implicit knowledge of their members, their abilities, talents, and skills(Córcoles, 2012). Salleh & Selamat (2007) believes that the academic staff in educational institutions are the ones that make intellectual capital through their abilities, direction, and intellectual intelligence, and that they can improve those abilities by possessing scientific skills to accomplish various activities in a distinct way.

Despite the divergence of the researchers' views on the concept of intellectual capital, there is agreement among the majority that it consists of three dimensions: human capital, structural capital, and relational capital (Stewart, 1997; Salleh & Selamat, 2007; Roos, Bainbridge, & Jacobsen, 2001; Kamukama, 2013).

Human capital refers to specific knowledge, competencies, skills, personal networks of the company`s employees, their ability to generate and utilize it in the process of value creation. Human Capital is an indispensable

part of Intellectual capital and provides input to both organizational and relational capital.

Organizational capital usually refers to resources of the organization such as brands, patents and other intellectual property, systems, organizational structures, valuable information etc .

Relational capital includes relationships which it maintains with the main agents connected with its basic business processes – customers, consumers, intermediaries, representatives' suppliers, partners, etc (Martín-de-Castro et al., 2006).

Unlimited improvement is a new improvement tool proposed, which draws attention to the problems encountered in TQM implementations, which may affect or limit the success of TQM, and eliminate all limitations encountered in continuous improvement efforts. This tool will make an important contribution to the improvement of organizational performance when it is used as a new improving tool and application. In unlimited improvement, all the people, phases and practices are targeted to be covered by improvement, removal of all restrictions, elimination of obstacles, thereby expanding the scope of improvement. This may result in the best possible efficiency, effectiveness and quality level (Küçük, 2016b,335).



Unlimited improvement addresses all elements that affect organizational performance in scope and examined among the elements of the scale of the organization. Thus, all people, units, tools and applications are included in the improvement (Küçük, 2011).

The importance of unlimited improvement is mainly due to the problems encountered in TQM implementation and quality improvement only within certain limits and in a limited environment.

The main aim of unlimited improvement is to increase the productivity of the factor to the extent possible by extending the improvement to all the elements, and as a result, to ensure customer satisfaction and profit increase.

Finally, Unlimited improvement is not an alternative to continuous improvement or Kaizen. Unlimited improvement is a new tool that needs to be addressed together with its own perspective and application systematic (Küçük, 2016b: 340-346).

**3. Aims of Study**

The main purpose of this study; to identify the impact of intellectual capital with its dimensions (human capital, structural capital, relational capital) on unlimited improvement in Libyan public universities and introducing the concept of intellectual capital and unlimited improvement as concepts of modern management have a role in improving the performance of universities and increase profitability. And the extent to which these universities recognize the importance of these concepts in improving the university's competitive position.

**4. Scope and Method of the Study**

Application of the study on the sample from Libyan public universities and the variables which included in the study are intellectual capital with its three dimensions and unlimited improvement and the sample of the study is represented by the academic leaders (dean, associate dean, heads of scientific and administrative departments) in the universities are under study.



The researcher used the descriptive analytical method, the questionnaire was used for data collection, analysis and hypothesis testing**.**

In this study, the questionnaire consists of two parts. The first part contains a general information regarding gender, age, educational level and years of experience. The second part developed to measure the relationship between intellectual capital and unlimited improvement was formed in accordance with their dimensions. They are respectively as follows: Human Capital, Structural Capital, Relational Capital, and Unlimited Improvement.

Küçük (2016b) scale was used for unlimited improvement(dependent variable) and (Al-Fayoumi, 2010,Handzic & Öztürk, 2010, Subramaniam & Youndt, 2005) scales were used for intellectual capital dimensions (independent variable) .

The researcher used the five - point Likert scale in which 1=strongly agree, 5= strongly disagree (Küçük, 2016a: 81-83). The data obtained were analysed in SPSS 23.0 program. Validity and reliability were tested, and regression analysis was performed.

The study population consists of the academic leaders (dean, associate dean, heads of scientific and administrative departments), in Libyan public universities. The number of universities is 6. (320) copies of the questionnaire were distributed to the study sample and (39) copies were excluded because

were invalid for the purposes of analysis.

**5. Research Model**

The model of the study is shown in Figure 1.

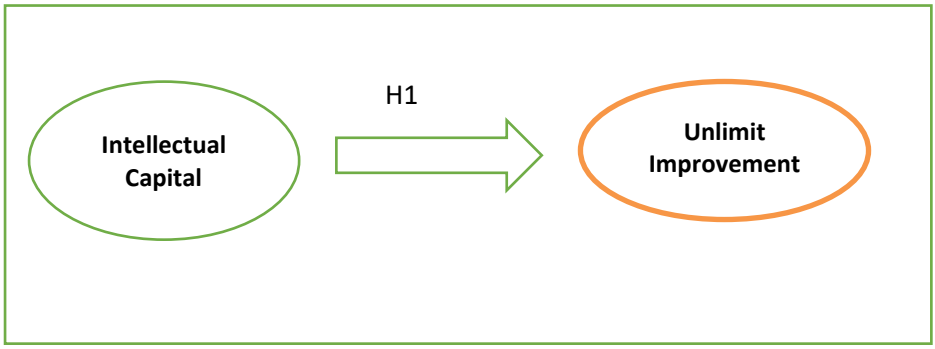




Figure 1. Research Model

As shown in Figure 1, there are two variables in the model. These; intellectual capital and unlimited improvement. The relationship between these variables is examined.

**6. Hypothesis**

In reviewing earlier studies, didn't found any research that directly examines the impact of intellectual capital on unlimited improvement.

state that there is a significant and positive relationship between intellectual capital investment and knowledge management processes and there is a significant and positive impact of both intellectual capital investment and knowledge management processes on applying TQM.

Anfoos (2014) found that there is a statistically significant relationship between the Intellectual Capital Investment and Total Quality Management.

Benshina (2008) state that there is a significant positive relationship between performance management and unlimited improvement and its components (planning, standardizing, and improving the quality of work, relationship with customer, human resources development and maintenance policy.

Küçük (2011) found that unlimited improvement is a quality improvement instrument that based on the realization of all business activities continuously and without any limitations quality improvement activities, people, process and to other internal and external factors of organization, and is a quality improvement instrument focusing on elimination of all existing and potential restrictions.

Küçük (2011), (2016b), and Ay & Nurov (2017) determined that there is a relationship between unlimited improvement and organizational performance. Based on the literature above, the following hypothesis is formulated:

**H1:** There is a statistically significant impact of intellectual capital (human, structural, relational capital) on applying unlimited improvement.

## 7. Data Analysis

### Descriptive statistics of demographic variables



This section describes and distributes the individuals involved in the study according to gender, age, years of experience and educational level. The results obtained are displayed in the table below.

**Table 1.** Distribution of The Individuals Of The Study

| Variable | Category | Frequency | Percent (%) |
|---|---|---|---|
| Gender | Male | 211 | 75.1% |
| | Female | 70 | 24.9% |
| Total | | 281 | 100% |
| Age | Less than 30 years old | 18 | 6.4% |
| | From 30-40 years | 128 | 45.6% |
| | From 41-50 years | 103 | 36.6% |
| | Over 50 years old | 32 | 11.4% |
| Total | | 281 | 100% |
| Experience years | Less than 5 years | 102 | 36.3% |
| | From 6-10 years | 102 | 36.3% |
| | From 11-15 years | 49 | 17.4% |
| | More than 16 years | 28 | 10% |
| Total | | 281 | 100% |
| Level of education | Higher Diploma | 8 | 2.8% |
| | Bachelor | 35 | 12.5% |
| | Masters | 157 | 55.9% |
| | PhD | 81 | 28.8% |
| Total | | 281 | 100% |



From the Table above, we note the following:

- Most of the respondents from a male % by 75.1%
- Most respondents are over the age of 30 years
- About a two-thirds (63.7%) of the respondents had more than 6 years of experiences in their universities
- Most (84.7%) of the respondents held postgraduate degrees

**Measures' Reliability and Validity**

A preliminary analysis consists of reliability tests and factor analyses to establish the quality of information of study variables which are represented by intellectual capital and unlimited improvement.

The statistics related to the exploratory factor analysis which reveal the intellectual capital and unlimited improvement factors and factor loads represented by the participants are shown in Tables 2 and 3.

**Table 2.** Descriptive Factors Analysis Intellectual Capital Scale

| Intellectual Capital (IC) | Factor Loads | Eigen value | variance Explanation rate (%) | Cronbach's alpha | Mean | KMO |
|---|---|---|---|---|---|---|
| **Human Capital (HC)** | | 3.343 | 53.341 | 0.924 | | 0.942 |
| 1. The university has strong and visionary leadership | 0.651 | | | | 3.20 | |
| 2. The university hires high-quality academic staff | 0.745 | | | | 3.11 | |
| 3. Academic staff are dedicated full-time researchers/instructors | 0.683 | | | | 3.06 | |
| 4. The university provides full admin support for academics | 0.683 | | | | 3.09 | |
| 5. Academic staff work with small groups of students to provide them high-quality teaching | 0.698 | | | | 3.08 | |
| 6. Academic staff are motivated to do research | 0.708 | | | | 3.06 | |
| 7. The University has a clear policy of attracting distinguished faculty and administrators | 0.691 | | | | 3.07 | |
| 8. The University has a low turnover rate of work among its staff (professors and administrators) | 0.746 | | | | 3.14 | |
| 9. Professors at the university are keen to place their place of work when publishing their scientific works | 0.739 | | | | 3.14 | |

**Table 2.** Descriptive Factors Analysis Intellectual Capital Scale (Cont.)

| Intellectual Capital (IC) **Structural Capital (SC)** | Factor Loads | Eigen value | variance Explanation rate (%) | Cronbach's alpha | Mean | KMO |
|---|---|---|---|---|---|---|
| 10.The university supports the culture of continuous improvement of the educational process and its outputs | 0.573 | | | | 3.01 | |
| 11. The university has several specialty domains | 0.653 | | | | 3.19 | |
| 12. The university has contributed to many scholarly outlets | 0.663 | | | | 2.99 | |
| 13. Own research outlets have been started by the university | 0.622 | 3.343 | 53.341 | 0.924 | 3.05 | |
| 14. The university offers necessary library and info-services | 0.565 | | | | 2.93 | |
| 15. IT provides reliable infrastructural support | 0.641 | | | | 3.00 | |
| 16. Organizational relations between the university faculties and their scientific departments are characterized by cooperation, integration and exchange of experiences. | 0.688 | | | | 3.00 | |
| 17. The University's work style focuses on self-managed teams | 0.646 | | | | 3.19 | |
| Relational Capital (RC) | | | | | | |
| 18. High quality students are being attracted | 0.707 | | | | 3.16 | |
| 19. University offers expertise to external stakeholders | 0.658 | | | | 3.04 | |
| 20. There is close partnership established with other universities | 0.727 | | | | 3.05 | |
| 21. The university is a member of scientific/ professional associations | 0.649 | | | | 3.12 | |

**Table 2.** Descriptive Factors Analysis Intellectual Capital Scale (Cont.)

| Intellectual Capital (IC) | Factor Loads | Eigen value | variance Explanation rate (%) | Cronbach's alpha | Mean | KMO |
|---|---|---|---|---|---|---|
| 22. The university encourages academic networking | 0.696 | | | | 3.07 | |
| 23. The university promotes positive public image | 0.695 | | | | 3.11 | |

As can be seen from Table 2, since the factor loadings of all expressions are over 0.5, the scales can be considered stable and appropriate for the analysis. The eigenvalues were 3,343 and the eigenvalues greater than 1 indicate that this study is scientifically appropriate and that the scales are valid and reliable. The Cronbach's alpha coefficient was found to be 0.92 between (0,80 and 1) so the scale was highly reliable (Küçük, 2016: 228-232).



**Table 3.** Descriptive of Factors Analysis Unlimited Improvement

| Unlimited Improvement (UI) | Factor Loads | Eigen value | variance Explanation rate (%) | Cronbach's alpha | Mean | KMO |
|---|---|---|---|---|---|---|
| 1. All the academic and administrative leadership participate in the training | 0.797 | 5.322 | 66.527 | 0.928 | 3.25 | 0.928 |
| 2. All the academic and administrative leadership are included in the improvement | 0.785 | | | | 3.18 | |
| 3. Organizational structure is included in the improvement | 0.829 | | | | 3.10 | |
| 4. All occupations are included in the improve. | 0.850 | | | | 2.96 | |
| 5. All tools are included in the upgrade | 0.803 | | | | 3.06 | |
| 6. All processes are included in the improve. | 0.828 | | | | 2.97 | |
| 7. All applications are included in the upgrade | 0.809 | | | | 2.95 | |
| 8. All suppliers are included in the improvement | 0.821 | | | | 3.04 | |

As can be seen from Table 3 since the factor loadings of all expressions are over 0.5, the scales can be considered stable and appropriate for the analysis. The eigenvalues were 5.322 and the eigenvalues greater than 1 indicate that this study is scientifically appropriate and that the scales are valid and reliable. The Cronbach's alpha coefficient was found to be 0.928 between (0,80 and 1) so the scale was highly reliable (Küçük, 2016: 228-232) .

**Testing hypothesis of the study**

Before the multiple linear regression analysis, the correlation coefficient was used to describe the association between Intellectual Capital and Unlimited Improvement as shown in table 4.

Table 4. Correlation of Variables



| **Variables** | | **1** | **2** | **3** | **4** | **M** | **S. D** |
|---|---|---|---|---|---|---|---|
| **1** | Human Capital | **1** | | | | 3.107 | .632 |
| **2** | Structural Capital | .505** | **1** | | | 3.044 | .625 |
| **3** | Relational Capital | .704** | .520** | **1** | | 3.090 | .557 |
| **4** | Unlimited Improvement | .709** | 673** | .682** | **1** | 3.134 | .617 |
| **Correlation is significant at the 0.01 level (2-tailed) | | | | | | | |

As the correlation matrix highlights Unlimited Improvement were positively and significantly linked to Human Capital, Structural Capital, and Relational Capital. These results may be explained essentially by the fact that the three dimensions of intellectual capital provide favorable terrain to achieve Unlimited Improvement.

Multiple Linear Regression was carried out to comprehend the link between intellectual capital and the degree of applying unlimited improvement. The results are summarized in table5.

**Main hypothesis**

There is a statistically significant impact of intellectual capital (human, structural, relational capital) on applying unlimited improvement.

To test this hypothesis, we used multiple regression analysis to ensure that there is an impact of intellectual capital (human capital, structural capital, relational capital) on unlimited improvement, as shown in Table 5.

**Table 5.** Results of the multiple regression analysis to test the Impact of Intellectual Capital on Unlimited Improvement

| Variables | B | t-value | Sig |
|---|---|---|---|
| Human Capital | .352 | 6.977 | 0.000 |
| Structural Capital | .369 | 8.808 | 0.000 |
| Relational Capital | .243 | 4.766 | 0.000 |

Overall model F= 181.950; $p < 0.001$; $R = 0.814$; $R^2 = 0.663$; Adjusted $R^2 = 0.660$

Independent variable: Human Capital, Structural Capital, Relational Capital

Dependent variable: Unlimited Improvement



Table 5 indicates the results of multiple regression for testing the effect of intellectual capital on unlimited improvement. According to the results included in the table above the value of R2 expresses the percentage of variation in the dependent variable (unlimited improvement) that could be referred to the independent variables (intellectual capital). Accordingly, the intellectual capital explains a percentage of 66.3 %.

The t statistics test the linearity significance of each intellectual capital constructs in relation to the dependent variable. Human capital, structural capital and relational capital showed a significant linearity importance in the prediction model, the magnitude of effect of these constructs on the dependent variable reflected from beta (β) coefficient as (0.352), (0.369), and (0.243) respectively they were statistically significant because the related probability values (sig. t) was ≤ 0.01.

A significance of this impact is confirmed by the calculated F value (181.950) which is a significant at level ($\alpha \leq 0.01$), this ensures validity of the main hypothesis. Since the value is 0.001 <0.005, the hypothesis is a significant and accepted (Küçük, 2016a: 245-249).

**8. Discussion**

The main purpose of this study is to examine the effect of intellectual capital (human, structural, and relational capital ) on unlimited improvement in the Libyan public universities. As results are shown in the table (5) validity of the main hypothesis which indicates that "There is a significant effect of intellectual capital (human capital, structural capital and relational capital) on unlimited improvement in the Libyan public universities at level ($\alpha \leq 0.01$)". The value of $R^2$ expresses the percentage of variation in the dependent variable (unlimited improvement) that could be referred to the independent variables (intellectual capital). Accordingly, intellectual capital explains a percentage of (66.3 %) of the variance in unlimited improvement. The value of calculated f equals (181.950) with the significant f equals (0.000) which is (≤0.01). Therefore, intellectual capital constructs together have a significant positive effect on the unlimited improvement in the Libyan public universities.



This result could be due to a better understanding of the benefits and importance of intellectual capital by the academic leaders of Libyan public universities as one of the major drivers for applying unlimited improvement, improve the performance, and gaining competitive advantage. Academic leaders on Libyan public universities realize that intellectual capital (Human, Structural and Relational capital) includes resources valuable, which impact an unlimited improvement and achieve superior performance of the organization. These findings are consistent with the studies of ((Al-Sarayra & Al-Najdawi, 2012; Ben Aichi & Ben Aichi, 2011; AL-Fayoumi, 2010; Anfoos, 2014; Yasin et al., 2018). All of these studies found that intellectual capital has a strong and positive significant effect on TQM practices and organizational performance.

**9. Results**

The results of this study are summarized as follows:

The level of evaluation of intellectual capital in the target universities is moderate (M= 3.081).

The level of applying unlimited improvement is moderate (M= 3.134).

There is a statistically significant impact of intellectual capital (human, structural, relational capital) on unlimited improvement at level (0.01).

**10. Suggestions**

Based on the findings of the study, the following suggestions can be made:

*Academic leaders in universities should pay attention to the development of their intangible assets in the same way that they are

interested in financing tangible asset.

*The administrative leaders should lay programs and policies which would develop the dimensions of intellectual capital (human, structural, relational capital) continuously and to increase the knowledge of individuals and spread the culture of joint work through the development of training plans that increase the efficiency of employees and their ability to solve Problems in modern and innovative ways.

* Create a positive organizational culture that favours creativity and innovation by directing staff efforts toward unlimited improvement to improve services quality and increase productivity.

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