

Evaluating the Use of Information and Communication Technology (ICT) in Universities and Higher Education Institutes from Managers' Point of View Case Study: Universities and Higher Education Institutes in the City of Qom

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Abstract

The aim of this research is to increase managers understanding of the role of Information and Communication Technology (ICT) in higher education, and benefits of its results. This research attempts to study the universities and higher education institutes' managers' point of view in the city of Qom towards the use of ICT in these organizations. In the present study, investigated the universities are compared in terms of ICT usage. This research is considered as applicative in terms of purpose, and explorative-field survey in terms of methods. After data analysis using SPSS software, we found that the use of ICT in studied universities from the perspective of managers is conducive. Also by ranking the universities in usage of ICT, it was found that the Research Institute of Hawzah and University and Qom IslamicAzad University are located at the highest and the lowest level, respectively.

Keywords: Information and Communication Technology (ICT), managers, universities and higher education institutes in the city of Qom

1. Introduction

Globalization process that currently encompassed the whole world has caused profound changes in many aspects of society which the university's role in this process should not be ignored.

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Universities around the world have nobility on the fact that they must adapt themselves to the impacts of globalization. Due to the nature of globalization that traverses country's borders and actually increases the flows of knowledge, ideas and information in all parts of the world, the university, as a traditional producer of knowledge, its mission of transferring knowledge to the next generation is exposed to many influences. Also increment of knowledge flows and perspectives means universities in one part of the world need change and to be transformed, in order to sustain and doing whatever missions are more powerfully. One of the striking aspects of globalization is the knowledge to use of ICTs (Conference on "Information Technology and University in Asia (ITUA)", 2002); so that in the last twenty years, the increasing importance of the ICT made most of the higher education institutes to use new technologies in order to achieve their new goals and aspirations (Hodgson, 2002; McNought, 2003; quoted from: Vanin et al., 2009, p.1). Kroeker (2000) argues that new technologies is both a creative force that creates opportunities and new methods and also the destructive force that destroyed the old ways, or at the lowest level, traditional methods of the perception of education (Furieux, 2004). Today, most organizations and educational institutions are using technology as an effective tool to monitor and improve their organizational performance (Kitcharoen, 2007, p.15).

2. Problem Statement

ICT usability in an organization, in particular and about a long duration are analyzed based on the current processes and structures of the organization and what people are doing with this technology. Only those technologies are employed which are coordinated with the processes and structures as well as individuals (Bouwman et al., 2005, p.4); so that Hill (1999) believes that learning how to apply information technologies is considered as an essential requirement for the close future (Furieux, 2004). Universities and higher education institutes, in order to survive and compete in today's society which is "increasingly being converted to the management and use of knowledge" (Smart, 1992; Wresch, 1996; quoted from: Furieux, 2004), are compelled to use the facilities and equipment that ICT provides in a maximum optimized way.

For the use of ICT in higher education, three steps must be considered: Choosing ICT, Adapting with the current situation and making changes with the help of ICT (Nyvang, 2006, p.2; quoted from: Yadegarzadeh et al., 2007, p.45).

Therefore after the choice of the ICT, the most important step in the effective use of information technology, is to analyze the present situation of technology in higher education of country which the result of this evaluation, we can improve strengths and think of appropriate solutions for the shortcomings and deficiencies with respect to the identified the strengths and weaknesses.

It should be said that the responsible for decisions about technology is on charge of management, decisions play a crucial role on the success of the organization (Lucas, 2000, p15). University managers should understand the potential benefits of access to information and communication technology applications, and implement it in their universities. In the shift towards the use of these technologies, universities need to adapt themselves with new methods and models (Hanafizadeh et al., 2007, p.34).

This study analyzes the status of usage of ICT in universities and higher education institutes in the city of Qom from managers' perspective with respect to the necessity of attention to status of implementing the ICT in universities and the role of management. In this study favorability or not favorability of the use of modern communication systems and computer networks, new communication equipment have been evaluated in order to supplement and storing, processing and disseminating information among universities in the study. Also in the present study the investigated universities are compared in terms of ICT usage. Therefore, the research question can be stated in this way:

First question: What are viewpoints of managers of universities and higher education institutes in the city of Qom on how organizations are using ICT?

The second question: How the universities are ranked, evaluated in terms of using ICT?

3. Purpose of the Research

The aim of this research is to increase understanding of the role of ICT in higher education management, and enjoyment of its results.

4. Topic Literature and a Review of the Previous Research

4-1. Information and Communication Technology (ICT)

The term "Information Technology" was applied first by "Leavit and Whisler" in 1958 to explain the role of computers in support of decision making and information processing in organizations (Zargar, 2004, p.16; quoted from: Sarlak and Forati, 2008, p.26). Kroecker (2000) believed that by the arrival of personal computers with the technology of the World Wide Web (WWW), the demand for faster, cheaper and reliable computer technology is has increased. Lyon (1988) argues that the increment of capacity, rapid development and expansion of these information technologies, has guided the nations towards an "information society" (Furneauux, 2004).

Scientists to date have offered various definitions of information and communications technology, sFlowersome of which include:

Lyon (1988) believed that the term "information technology" refers to "a set of computer and communications technologies which arebased on microelectronics" (p.40; quoted from: Furneauux, 2004).

Information and communication technology suite is referred to a combination of techniques, skills, processes and knowledge related to the tools (hardware, software) which are used in order to the preparation, production, storage, processing, retrieval and exchange of information in information systems and networks (Mahmoudi, 2007, p.226).

Definition of Flowers (1988) for Information technology is: "the use of computers and telecommunications for collecting, processing, storage, distribution and dissemination of sound, image, text and digital information" (p.284; retrieved from: Tansey, 2003, p.3).

The technologies that are used for processing, storage, and transmission of information in electronic form are called Information Technology (Lucas, 2000, p.11).

In general, a widely accepted definition of IT among scientists active in the field of information systems is: information technology contains hardware, software, support services and infrastructure which are used in order to store, transform, process, retrieve, and secure exchange of data and information (Lee, 2009, p.xx).

Most scholars say that the most basics of ICT include computer systems, networks, information highways, databases, artificial intelligence and multimedia intelligence that have a key role in production, processing and exchanging data (Mahmoudi, 2007, p.228).

4-2. ICT and Higher Education

Today information technology (IT) is used in almost all aspects of society, and as IT is undergoing rapid change, believing Rowley, Lujan, and Dolence, attentions and glances should be in the direction of stimulating innovations in education, research, and management, using computers. To achieve this, universities started to use IT, but to complete what Rowley, Lujan, and Dolence have stated, not only computer literacy of students must reach the highest possible level, and classrooms and laboratories must be ready for coordinating and implementing a variety of new technologies, but also the university management system should be developed and be integrated in a unified manner and in a network that is designed to act as intermediary between the university and the international community. IT's role in facilitating the activities of the University, both management and training related activities have to show itself in university management, management processes, improve researches and teaching- learning process in which IT is used (Titthasiri, 2000, p.153).

Benzie (1999) believes that there is a need to develop models to help researchers to explain and interpret the role of ICT in universities and its impact on teaching and learning of processes in universities in order to achieve success, is an important target for the universities (Romaniello and Medlin, 2009/2010).

Today, universities and institutions of higher education, see themselves in a new paradigm which has changed a lot in comparison to the previous paradigm. Table 1 compares these two paradigms.

Table 1. Comparison of the Previous Paradigm and new Paradigm in Higher Education

| Previous paradigm | New paradigm |
|---------------------------------------------------|--------------------------------------|
| Choosing the unit based on individual's abilities | Choosing the unit based on interest |
| Academic Calendar | Annual activity |
| University as a city | University as a thought |
| Graduate degree | Lifelong learning |
| University, a place for thought in society | University a partners in the society |
| Student:18 to 25 years old | Student = from cradle to grave |
| Book, a learning tool | Information based on Demand |
| Single production | Reusing the information |
| Students as a liability | Source of lifetime income |
| Delivery in the classroom | Delivery everywhere |
| Multicultural | Global Culture |
| Brick and Mortar | Bit and byte |
| Unit field | Multiple majors |
| Focus on Organization | Focus on Market |
| Government investment | Market Investment |
| Technology as a cost | Technology as a distinguisher |

(Source: Bard et al., 1997, p.5)

Successful and profitable development of ICT depends on innovative capabilities of universities to a large extent and needs an efficient management. Therefore, universities require a proper planning and integration based on their readiness in order to integrate these technologies in university activities and operations through electronic channels (Hanafizadeh et al., 2007, p.34).

4-3. A Review of Previous Research

Here are some researches that are relevant to the topic of this study:

1. In a study titled "Information Technology Strategic Planning Process for Institutions of Higher Education in Thailand" by Titthasiri (2000), the IT status and IT strategic planning in governmental and private institutions of higher education in Thailand has been studied. Results showed great interest towards the use of IT in both education and management area.

One of the problems concerning IT management at the university is lack of plan; the most important obstacles that occur during plan development are human resources for information technology and financial problems (retrieved from: p.153).

2. Furneaux (2004) in a study investigated the impacts of IT on the methods, potential forces and purpose of education. According to him, many researchers believe that the educational institutes which do not use IT more integrated at all educational levels encounter with major errors and challenges.

3. In a study entitled "Colleges and Universities: Survival in the Information Age" by Huff (2000) which he believes that to face with planning for IT is one of the most important, expensive, time consuming and dangerous things that institutions and universities can undertake. Those institutions that are able to act successfully in establishing university and management frameworks within which rapid technological change and adapt may occur, will make the act of survival and those with arbitrary and old management styles and decision makings will lose their existence (p.635).

4. Ahmed et al. (2007) by analyzing, planning, implementing and dissemination of information technology (IT) in an academic environment concluded that major obstacles in the process of applying IT are to think that the knowledge is adequate and withstand the changes (quoted from: p.469).

5. In April 2002, a conference was held at the University Chulalongkorn that its objectives were: a) to collect research findings and best ideas on how to make effective use of ICTs to strengthen Asian universities in research, teaching and service activities; b) to provide the opportunity for greater communication and cooperation between researchers in the field; c) to provide a set of guidelines and strategies to optimize the potential benefits of ICTs to policymakers and college administrators who are responsible for final acceptance and implementation of these technologies (Conference on "Information Technology and University in Asia (ITUA)", 2002).

6. In 2005, Ulukan from the University Anadolay in Turkey released an article entitled "Management Issues in Free and Distance Education Institutions in Transition: The Need for a Systematic Approach". This paper aims to contribute to a better understanding of the issues that should be considered in transition to higher education institutes with greater competitiveness and effectiveness.

In this paper, the most important aspects of organizational fields have been studied in order to adapt to technological changes (Hanafizadeh et al., 2007, p.36).

7. "Identifying Strategies for ICT Development in the Iranian Universities" is the title of a study by Hanafizadeh et al. (2007). They believe that to compete effectively in the new learning environment, it is essential that all countries continuously improve the use of ICT in universities. However, the effective use of ICT requires implementing policies and programs that fit local circumstances. In this paper, by the modeling of 12 countries and 5 regional groups, 279 solutions for improving the use of ICT in universities will be extracted and using content analysis method, 23 solutions will be selected among them. Then the survey will be done at the national level, using statistical tests, and appropriate strategies to suit the domestic conditions will be presented (p.33).

8. Montazer (2004) in a study based on indicators provided by UNESCO scrutinized a number of important universities including the University of Arak, Al-Zahra, Mazandaran, PayamNour, TarbiatModarres, University of Tehran, Isfahan University of Technology, Amirkabir, Sharif, ShahidChamran in Ahwaz, Science and Technology of Iran using information and communications technology so that the status of these universities is imaged like below:

- Lack of Policy to use information technology in higher education;
- Lack of comprehensive development plan of information technology in higher education;
- Lack of adequate funding for IT development projects in higher education;
- Lack of responsible for implementing a comprehensive plan for the development of ICT in higher education;
- Lack of monitoring and evaluation mechanisms for the implementation of the comprehensive plan of ICT development in higher education;
- Low number of computers per hundred students, Tehran: 20 devices, other cities: 8 devices;
- Low number of educational computers;
- Low bandwidth and...(Yadegarzadeh et al., 2007, p.45).

5. Method of the Research

The present study is considered applicative in terms of purpose and explorative-field in method. Method of collecting data is library and field method.

In the library method, the information related to the literature and history of topic, were collected by studying books and articles and in the field method, the data were collected by analysis of distributed questionnaires. Validity of the questionnaire content was approved by knowledgeable and specialized individuals in management and to assess the reliability of the questionnaire, the Cronbach's Alpha (α) is used. In this study, using 14 initial questionnaires, the level of alpha equal to 951.0 was obtained, respectively, indicating high reliability of the questionnaire. In this study, the SPSS software was used for data analysis.

6. Population and Sample Size

The population of this study is managers of universities and higher education institutes in the city of Qom, including Qom University, Mofid University, University of Tehran-college of Qom (Pardis), Shahab-Danesh Private Higher Education Institute, PayamNour University, University of Religions and Denominations, Research Institute of Hawzah and University, and Qom Islamic Azad University, which contains 155 members. It is worth mentioning that these managers were in job position of chancellor, deputy or vice-chancellor, manager and supervisor. Finally, 78 managers were selected as sample size that is calculated by this formula.

$$n = \frac{N z_{\frac{\alpha}{2}}^2 \sigma_x^2}{\epsilon^2 (N - 1) + (Z_{\frac{\alpha}{2}}^2 \sigma_x^2)}$$

n = the size of sample

N = the size of population

α = the level of error

$Z_{\frac{\alpha}{2}}$ = the amount of statistic normal distribution

σ_x^2 = the population variance

ϵ = the level of confidence

n present study, N=155, $\alpha=0.05$, $Z_{\frac{\alpha}{2}}=1.96$, $\sigma_x^2=0.814$, $\epsilon=0.15$.

Table 2: Frequency Distribution of Managers by University of Service

| Row | Organization/institute name | Abundance | Percentage |
|-------|--------------------------------------------------|-----------|------------|
| 1 | Research Institute of Hawzah and University | 18 | 11.61 |
| 2 | PayamNourUniversity | 14 | 9.03 |
| 3 | University of Tehran-college of Qom (Pardis) | 24 | 15.48 |
| 4 | Shahab-Danesh Private Higher Education Institute | 8 | 5.16 |
| 5 | Qom Islamic Azad University | 6 | 10.32 |
| 6 | Qom University | 26 | 16.77 |
| 7 | University of Religions and Denominations | 18 | 11.61 |
| 8 | MofidUniversity | 31 | 20.02 |
| Total | | 155 | 100 |

7. Collection and Analysis of Data

In this part, after studying the demographic characteristics of the respondents, the research questions are analyzed.

7-1. Respondents' University of Service

Table 3. Frequency Distribution of Respondents by University of Service

| Row | Organization/institute name | Abundance | Percentage |
|-------|--------------------------------------------------|-----------|------------|
| 1 | Research Institute of Hawzah and University | 9 | 11.54 |
| 2 | PayamNourUniversity | 7 | 8.97 |
| 3 | University of Tehran-college of Qom (Pardis) | 13 | 16.67 |
| 4 | Shahab-Danesh Private Higher Education Institute | 4 | 5.13 |
| 5 | Qom Islamic Azad University | 8 | 10.26 |
| 6 | Qom University | 13 | 16.67 |
| 7 | University of Religions and Denominations | 9 | 11.54 |
| 8 | MofidUniversity | 15 | 19.23 |
| Total | | 78 | 100 |

7-2. Educational Level of Respondents

Table 4. Frequency Distribution of Respondents by Education Level

| Row | Organization/institute name | Bachelor's | | M.A. or M.Sc. | | Ph.D. | | Unknown | | Total | |
|-----|--------------------------------------------------|------------|-------|---------------|-------|-------|-------|---------|-------|-------|-----|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| 1 | Research Institute of Hawzah and University | 5 | 55.60 | 4 | 44.40 | 0 | 0.00 | 0 | 0.00 | 9 | 100 |
| 2 | PayamNour University | 4 | 57.10 | 2 | 28.60 | 0 | 0.00 | 1 | 14.30 | 7 | 100 |
| 3 | University of Tehran-college of Qom (Pardis) | 7 | 53.80 | 4 | 30.80 | 2 | 15.40 | 0 | 0.00 | 13 | 100 |
| 4 | Shahab-Danesh Private Higher Education Institute | 3 | 75.00 | 1 | 25.00 | 0 | 0.00 | 0 | 0.00 | 4 | 100 |
| 5 | Qom Islamic Azad University | 2 | 25.00 | 5 | 62.50 | 1 | 12.50 | 0 | 0.00 | 8 | 100 |
| 6 | Qom University | 8 | 61.50 | 3 | 23.10 | 1 | 7.70 | 1 | 7.70 | 13 | 100 |
| 7 | University of Religions and Denominations | 0 | 0.00 | 8 | 88.90 | 0 | 0.00 | 1 | 11.10 | 9 | 100 |
| 8 | Mofid University | 12 | 80.00 | 2 | 13.30 | 1 | 6.70 | 0 | 0.00 | 15 | 100 |
| | Total | 41 | 52.56 | 29 | 37.18 | 5 | 6.41 | 3 | 3.85 | 78 | 100 |

7-3. The Age of Respondents

Table 5. Frequency Distribution of Respondents by Age

| Row | Organization /institute name | 30 years old and less | | 31 to 40 years old | | 41 to 50 years old | | More than 50 years old | | Unknown | | Total | |
|-------|--------------------------------------------------|-----------------------|-------|--------------------|-------|--------------------|-------|------------------------|-------|---------|-------|-------|-----|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| 1 | Research Institute of Hawzah and University | 2 | 22.22 | 4 | 44.44 | 2 | 22.22 | 0 | 0.00 | 1 | 11.11 | 9 | 100 |
| 2 | Payam Nour University | 1 | 14.29 | 2 | 28.57 | 1 | 14.29 | 0 | 0.00 | 3 | 42.86 | 7 | 100 |
| 3 | University of Tehran-college of Qom (Pardis) | 2 | 15.38 | 7 | 53.85 | 2 | 15.38 | 1 | 7.69 | 1 | 7.69 | 13 | 100 |
| 4 | Shahab-Danesh Private Higher Education Institute | 0 | 0.00 | 2 | 50.00 | 1 | 25.00 | 1 | 25.00 | 0 | 0.00 | 4 | 100 |
| 5 | Qom Islamic Azad University | 2 | 25.00 | 4 | 50.00 | 2 | 25.00 | 0 | 0.00 | 0 | 0.00 | 8 | 100 |
| 6 | Qom University | 1 | 7.69 | 8 | 61.54 | 1 | 7.69 | 1 | 7.69 | 2 | 15.38 | 13 | 100 |
| 7 | University of Religions and Denominations | 0 | 0.00 | 4 | 44.44 | 4 | 44.44 | 0 | 0.00 | 1 | 11.11 | 9 | 100 |
| 8 | Mofid University | 6 | 40.00 | 7 | 46.67 | 1 | 6.67 | 1 | 6.67 | 0 | 0.00 | 15 | 100 |
| Total | | 14 | 17.95 | 38 | 48.72 | 14 | 17.95 | 4 | 5.13 | 8 | 10.26 | 78 | 100 |

7-4. Experience of Respondents

Table 6. Frequency Distribution of Respondents According to Years of Service

| Row | Organization /institute name | 5 years and less | | 6 to 10 years | | 11 to 15 years | | More than 15 | | Unknown | | Total | |
|-------|--------------------------------------------------|------------------|-------|---------------|-------|----------------|-------|--------------|-------|---------|-------|-------|-----|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| 1 | Research Institute of Hawzah and University | 3 | 33.33 | 3 | 33.33 | 1 | 11.11 | 0 | 0.00 | 2 | 22.22 | 9 | 100 |
| 2 | PayamNour University | 1 | 14.29 | 1 | 14.29 | 4 | 57.14 | 0 | 0.00 | 1 | 14.29 | 7 | 100 |
| 3 | University of Tehran-college of Qom (Pardis) | 0 | 0.00 | 7 | 53.85 | 2 | 15.38 | 2 | 15.38 | 2 | 15.38 | 13 | 100 |
| 4 | Shahab-Danesh Private Higher Education Institute | 1 | 25.00 | 0 | 0.00 | 0 | 0.00 | 1 | 25.00 | 2 | 50.00 | 4 | 100 |
| 5 | Qom Islamic Azad University | 2 | 25.00 | 1 | 12.50 | 2 | 25.00 | 2 | 25.00 | 1 | 12.50 | 8 | 100 |
| 6 | Qom University | 0 | 0.00 | 8 | 61.54 | 3 | 23.08 | 0 | 0.00 | 2 | 15.38 | 13 | 100 |
| 7 | University of Religions and Denominations | 3 | 33.33 | 3 | 33.33 | 2 | 22.22 | 1 | 11.11 | 0 | 0.00 | 9 | 100 |
| 8 | Mofid University | 5 | 33.33 | 3 | 20.00 | 3 | 20.00 | 2 | 13.33 | 2 | 13.33 | 15 | 100 |
| Total | | 15 | 19.23 | 26 | 33.33 | 17 | 21.79 | 8 | 10.26 | 12 | 15.38 | 78 | 100 |

7-5. The Respondents' Job Position

Table 7: Frequency Distribution of Respondents by Job Position

| Row | Organization /institute name | Chancellor | | Vice-chancellor | | Manager | | Supervisor | | Unknown | | Total | |
|-------|--------------------------------------------------|------------|-------|-----------------|-------|---------|-------|------------|-------|---------|-------|-------|-----|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| 1 | Research Institute of Hawzah and University | 1 | 11.10 | 0 | 0.00 | 5 | 55.60 | 2 | 22.20 | 1 | 11.10 | 9 | 100 |
| 2 | PayamNour University | 0 | 0.00 | 1 | 14.30 | 6 | 85.70 | 0 | 0.00 | 0 | 0.00 | 7 | 100 |
| 3 | University of Tehran-college of Qom (Pardis) | 1 | 7.70 | 2 | 15.40 | 6 | 46.20 | 3 | 23.10 | 1 | 7.70 | 13 | 100 |
| 4 | Shahab-Danesh Private Higher Education Institute | 0 | 0.00 | 0 | 0.00 | 4 | 100 | 0 | 0.00 | 0 | 0.00 | 4 | 100 |
| 5 | Qom Islamic Azad University | 0 | 0.00 | 2 | 25.00 | 3 | 37.50 | 1 | 12.50 | 2 | 25.00 | 8 | 100 |
| 6 | QomUniversity | 2 | 15.40 | 0 | 0.00 | 10 | 76.90 | 1 | 7.70 | 0 | 0.00 | 13 | 100 |
| 7 | University of Religions and Denominations | 0 | 0.00 | 0 | 0.00 | 7 | 77.80 | 1 | 11.10 | 1 | 11.10 | 9 | 100 |
| 8 | MofidUniversity | 2 | 13.30 | 0 | 0.00 | 7 | 46.70 | 5 | 33.30 | 1 | 6.70 | 15 | 100 |
| Total | | 6 | 7.69 | 5 | 6.41 | 48 | 61.54 | 13 | 16.67 | 6 | 7.69 | 78 | 100 |

7-6. Analysis of the Research Questions

Investigating the first question: what are viewpoints of managers of universities and higher education institutes in the city of Qom on how organizations are using ICT?

To investigate the first question, we use one-sample t-test. This test is used to determine significance of differences between the mean values of every variable with a constant called the test value. The main focus in using one-sample t-test is to select the test value that must express a point in the middle.

In the present study, according to the spectra taken in responses, the test is considered equal to 3. While the mean response of each variable is greater than the number 3, then position in society would be favorable; otherwise, based on the test population, the studied variable is not favorable.

In the test, H_0 and H_1 hypotheses to check the status of mean comments of population using a taken sample is expressed as follows:

$$\begin{cases} H_0 : \mu_x \geq \mu_0 \\ H_1 : \mu_x < \mu_0 \end{cases}$$

Considering the above mentioned, $\mu_0=3$.

In this test, it will be decided according to the P-value component provided. If the amount is less than the test (α) and the confidence interval bounds of "mean difference with test value" is positive, H_0 hypothesis is rejected, otherwise there is no reason to reject the hypothesis H_0 . In the case of this study, test level is considered 0.05.

In the considered test, H_0 and H_1 hypotheses are expressed to check the status of mean comments using the taken sample, as follows:

$$\begin{cases} H_0 : \mu_{ICT\ usage} \leq 3 \\ H_1 : \mu_{ICT\ usage} > 3 \end{cases}$$

Table8. Results of T-Test to Determine the Status of the Component Average of "Using ICT"

| Results table | | |
|--------------------------------|-------------------------------------------------------------------|--------------------|
| Frequency | Mean | Standard deviation |
| 78 | 3.48 | 0.66 |
| t-test | Freedom degree | P-value |
| 6.43 | 77 | 0.000 |
| Mean difference and test value | 95%confidence interval for the mean difference and the test value | |
| | Lower bound | Upper bound |
| 0.48 | 0.33 | 0.63 |

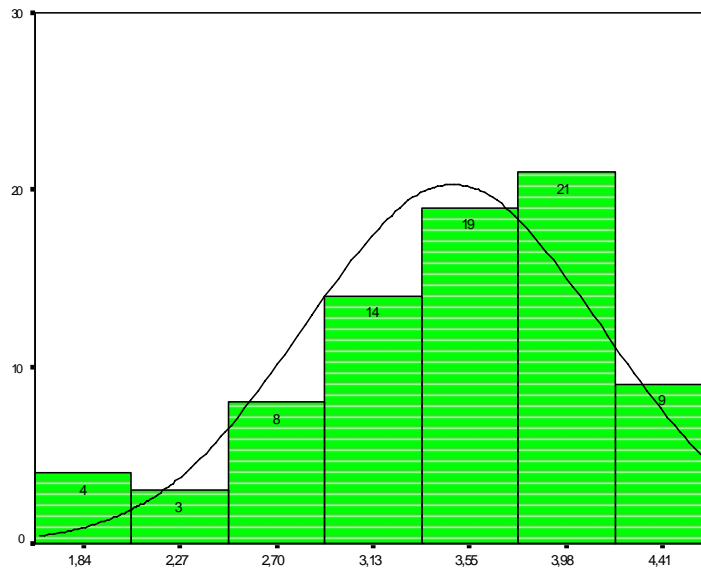


Figure1: Frequency Histogram of the Component of "Using ICT"

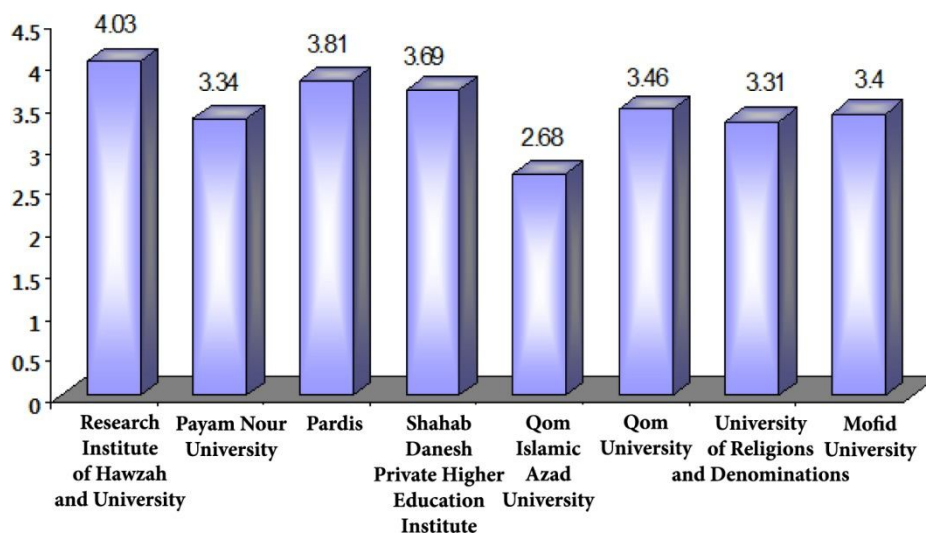
As shown in Figure 1, concentration of the response is far from the number 3 which shows the difference between the sample average and the test value which the difference is 0.48. According to the Contents of Table 8, obtained P-value is much smaller than the error $\alpha=0.05$, as well, the resulting confidence interval bounds for the difference between the average of community and the test value was positive, and the minimum difference is 0.33. So, H_0 hypothesis which tells that the average of community equal to or smaller than the number 3 is rejected at the level of 5% and the average of the community is significantly larger than the number 3.

So we can say: the status of component of "using ICT" in the community is favorable.

Investigating the second question: how the universities are ranked, evaluated in terms of using ICT?

Table 9: Status of the Component of "Using ICT"

| Row | Organization/institute name | Mean | Median | Standard deviation |
|-----|--------------------------------------------------|------|--------|--------------------|
| 1 | Research Institute of Hawzah and University | 4.03 | 4.19 | 0.52 |
| 2 | PayamNour University | 3.34 | 3.44 | 0.58 |
| 3 | University of Tehran-college of Qom (Pardis) | 3.81 | 3.81 | 0.40 |
| 4 | Shahab-Danesh Private Higher Education Institute | 3.69 | 3.69 | 0.61 |
| 5 | Qom Islamic Azad University | 2.68 | 2.66 | 0.81 |
| 6 | Qom | 3.46 | 3.38 | 0.49 |
| 7 | University of Religions and Denominations | 3.31 | 3.19 | 0.47 |
| 8 | Mofid University | 3.40 | 3.63 | 0.70 |

**Figure2. Graph Comparing Mean Component of "Using ICT"**

As shown in Table 9 and Figure 2, according to the taken samples, the average of the component of "using ICT" for respondents from all universities, except of Qom Islamic Azad University, is more than the average (number 3), respectively. Among all the universities in the study, the research institute with an average of 4.03 has the best position in the component. After that University of Tehran-college of Qom (Pardis) and Shahab-Danesh Private Higher Education Institute are the second and third ranks with averages of 3.81 and 3.69.

The status of this component is lower in Qom Islamic Azad University than others and the average responses in that University is obtained to be 2.68.

8. Conclusions and Recommendations

In this study we found that the use of ICT in universities and higher education institutes in the city of Qom from the perspective of managers is favorable; This means that according to the managers, the use of modern communication systems and computer networks and new communication equipment in order to supply, store, process and disseminate information in universities of the study is at a desirable level. Now managers take better steps in order to promote the development of ICT in their universities with the knowledge of the results of this study and do the necessary changes in their organizations should with the help of this technology. Also by comparing the evaluated Universities in terms of use of ICT, it was found that Research Institute of Hawzah and University and Qom Islamic Azad University are located at the highest level and the lowest level, respectively. Directors of the studied universities could enhance the potential of ICT or eliminate or reduce problems related to ICT considering this ranking (Table 9 and Figure 2).

Finally, several research proposals on topics similar to this study are provided for researchers and enthusiasts

1. Evaluating the use of ICT in other universities and higher education institutes;
2. Analyzing the ability of managers and staff of higher education in the use of ICT;
3. Assessment of students' views on the current situation in the universities about ICT;
4. Investigating the attention of higher education management to the role of study and research around ICT.

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