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THE RELATION BETWEEN ORGANIZATIONAL BEHAVIOR AND CONVERGING TECHNOLOGIES

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ABSTRACT

This study aims to examine the relation between organizational behavior and converging technologies. There is a strong relation between organizational behavior and technology because technology determines the human resources needed by an organization; moreover, it determines the structure, resources, and administrative methods of an organization. It also severely influences the description of jobs and their classification. The converging technologies are one of the most recent technologies. They are developing in the four realms of technologies consisting of cognitive technology, biotechnology, information technology, and nanotechnology. Since converging technologies have a very high capacity, they influence all of the aspects of human life especially organizations and organizational behavior. The statistical sample of the study consists of 50 experts in the field of the aforementioned technologies. The members' opinions have been collected and analyzed via survey and questionnaire. The results show that the impact of applying converging technologies on improving organizational behavior is at a high level. Moreover, the impact of applying converging technologies on improving organizational behavior and its components is significant at confidence level of 99 percent.

Keywords: Organizational behavior, Converging technologies, Organizational changes, Organization structure, Organization employees.

1. INTRODUCTION

Human's constant developments have led to the change of different organizations. The organizations should accept the change as a necessity and they should reach development by following structures and their functions. The organizational behavior and the applying of the technology in accordance with it play an important role in the development of the organization.

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Today, successful organizations pay attention to the mentioned factors and make desirable changes in their functions (Allen and Rush, 2001).

Regarding role of new technologies (converging technologies) as the new infrastructure and its impacts on different aspects of organizational behavior, necessarily, there should be a relation between converging technologies and organizational behavior.

Organizational behavior plays an important role in reaching goals and strategies of the organization. Many of the experts believe that it is an important source of achieving competitive advantage via effective and flexible changeability (Bihail and William, 2003). The organizational behavior is a set of activities which are beyond cognition, tendency, and different individual behaviors. The organizational behavior is usually goal-oriented (Beckert and Michael, 2008). Generally, it results from the tendency toward specific goals

Technology could completely change the organizational structure, hierarchy of authority, planned goals and strategies of the organization, organizational culture, environment, communications, motivation, and performance of managers and employees. One of the newest technologies is the converging technologies. They consist of cognitive technology, biotechnology, information technology, and nanotechnology which is the manipulation of matter on an atomic, molecular, and supramolecular scale, description of nanotechnology refers to the particular technological goal of precisely manipulating atoms and molecules for fabrication of Microscale products. Since they have a high ability in relation to the causal influence, they have many consequences for all aspects of human life (Gagne and Deci, 2005). Since the scientific and technical aspects of converging technologies are not simultaneous, and also the converging technologies could influence different layers of the external reality, the converging technologies have a unique place among other man-made technologies. In fact, none of the sciences and technologies could be compared with the converging technologies. Therefore, the influencing degree of the converging technologies on different aspects of human's life has unbelievably increased (Haslam, 2001).

The scientists call the converging technologies "growing research plans". In other words, the convergence will be reached in the future; however, its exact time cannot be determined (Martinsons Aelita and Martinsons, 1994).

1.1. The Organizational Behavior and Converging Technologies

The organizational behavior refers to studying individuals and groups at the organization. The study helps to have a better understanding of oneself and the others at the working environment. The organizational behavior could also develop the potential capacity for achieving success at the present working environment that is dynamic and ever changing. However, from different thinkers' opinions, the organizational behavior is defined as follows:

- The organizational behavior is defined as the study of individuals and groups at the organization.
- The organizational behavior has roots in the behavioral sciences and it is an applied science with a contingency approach to individuals and the organization.

- The organizational behavior is an academic field based on scientific basis and it leads to the development of organizations and their aspects (Miri and Afrouz, 2005).

Therefore, the organizational behavior (OB) is a field of study that studies the impact of individuals, groups, and the organizational structure. Its purpose is to apply the knowledge of organizational behavior in order to increase the efficiency of the organization (Modares and Mir Hoseini Zavareh, 2006).

1.2. Principles of Organizational Behavior

About one century ago, the thinkers paid more attention to the systematic review of management. At first, the attentions were concentrated on the physical condition of the activities, the rules of the office, and the engineering rules of the industries. In 1940s, studying the relation including humans as a necessity was more considered. Therefore, it was a motivation to have research studies in relation to individuals' attitudes, group dynamism, and the relation between managers and employees. Today, the field of organizational behavior as a scientific system has focused on the scientific understanding of individuals' and groups' behaviors at the organizations (Nadled and Tushman, 1997).

1.3. The Models of Organizational Behavior

Totally, there are four main frames of models based on which the organization behaves:

1. Autocratic model: the basis of this model is power in the hierarchy of management. The employees need to obey the managers' orders. The minimum efficiency belongs to the employees following this model.
2. Custodial model: the model is based on the economic resources and the management of money. The employees of this model move toward security, profit, and dependence of the organization. According to this model, there would be a passive cooperation.
3. Supportive model: the model is based on leadership and supportive direction-giving. The employees move toward job efficiency and participation. The employees pay attention to their place in the organization, therefore, this is a model of progress and awareness.
4. Collegial model: the model is based on the colligation between group and management. The employees move toward responsive behavior and individual personality. The employees pay attention to self-activation and they are willing to have more and better activities.

In fact, no organization acts based on one of the mentioned models. However, one of the models is dominant and overlaps other models. The autocratic model has roots in the industrial revolution and the managers of this organization act based on the Theory X of McGregor. However, the other three models have roots in the Theory Y of McGregor. Each of the models belongs to a period of time, but the collegial model is considered as the beginning of the new paradigm of this period (Paul and Ken, 1996).

1.4. Aspects and Components of the Organizational Behavior

Employees, structure, and the environment are the aspects of the organizational behavior.

1. Employees: the employees of an organization make the social system within an organization. Employees make big and small formal and informal groups. The relevant variables consist of employees' motivation; learning and perception; performance; attitudes; job satisfaction; and interactions.
2. Structure: the structure determines communications within the organization and it organizes the units, individuals, and resources of the organization. The variables consist of the planned goals and strategies of the organization, the hierarchy of authority, the organizational culture, the application of human resources' methods and policies, the communication between units and the inter-organizational communications, and so forth.
3. Environment: all of the organizations work regarding their surroundings. An organization follows its activities in communication with larger system such as government, other organizations, and people (Paya *et al.*, 2011).

1.5. The Concept of Converging Technologies

The converging technologies include the information technology, the biotechnology, the cognitive technology, and the nanotechnology. The nanotechnology intends to perceive the properties of materials, structures, and tools at the nonmetric scale and also to control the material or devices at this scale. The biotechnology refers to applying biological organisms and processes in the service and manufacturing industries. The cognitive technologies study the cognitive functions of the brain and mind and they try to develop technologies derived from this new knowledge. The cognitive technology intends to improve humans' quality of life, solve damages resulted from brain injury, produce intelligent systems, and optimally use human's mental faculties. The information technology studies, design, develop, and perform the support or management of information systems based on computer. The converging technologies respond to the contemporary humans' needs via synergy and integration. From the beginning of the 21st century, the converging technologies have been considerably considered by countries, societies, and academic institutes. The synergy of these technologies causes a great technology that influences the human civilization. The impact is so comprehensive that some of the thinkers call it the fourth wave of human civilization. The most important characteristic of this wave refers to the development of human's capabilities and the improvement of his quality of life by using products of the converging technologies (Pugh *et al.*, 1969).

2. METHODOLOGY

One of the most important bases fora research is its methodology. The methodology determines the criteria which should be considered in the process of a scientific research study (Roco Mihail and William Sims, 2002). Therefore, the methodology and its main components will be introduced here.

Research methodology: the present paper is a descriptive study. The research attempts to describe the gathered data, to analyze them, and to reach a rational conclusion.

The statistical population and sample: the statistical population of the study includes all of the scholars who have specialty in the fields of nanotechnology, biotechnology, information

technology, and cognitive technology. Moreover, the study consists of 50 members as the statistical sample of the study.

2.1. Research Hypotheses

The primary hypothesis:

- The application of converging technologies has a significant effect on improving organizational behavior.
- The secondary hypotheses:
- The application of converging technologies has a significant effect on improving employees' performance in the organization
- The application of converging technologies has a significant effect on improving employees' learning and perception in the organization
- The application of converging technologies has a significant effect on improving employees' motivation in the organization
- The application of converging technologies has a significant effect on employees' quality of communications in the organization
- The application of converging technologies has a significant effect on changing the goals and strategies of the organization
- The application of converging technologies has a significant effect on improving organizational culture.
- The application of converging technologies has a significant effect on improving methods of using organizational resources.

2.2. Methods of Collecting Data

The present paper collected data based on the quantitative approach of the research-made questionnaire regarding the effect of applying converging technologies on the aspects of the organizational behavior. Generally, it includes 20 questions of the five Likert items.

Validity and reliability: in order to estimate the validity of the research, the technique of content validity and nominal validity- using scholars' opinions- has been applied. Moreover, the Cronbach's alpha coefficient which is higher than 0.8 for the questions has been used to assess the reliability of the research.

3. FINDINGS

Table-1. Frequency Distribution Regarding Professors' Age

Variables	Frequency	Frequency Percentage	Valid Percent	Mean
35 – 40 years old	6	3%	6%	48.2
41-45 years old	18	36%	36%	
45-50 years old	17	34%	34%	
50-55 years old	9	18%	18%	
Over 55 years	3	6%	6%	
Total	53	100%	100%	

According to table 1, it is concluded that 6 percent of the professors are 35-40 years old, 36 percent of them are 41-45years old, 34 percent of them are 45-50years old, 18 percent of them are 50-55years old, and 6 percent of them are over 55. The mean age of them is also 48.2.

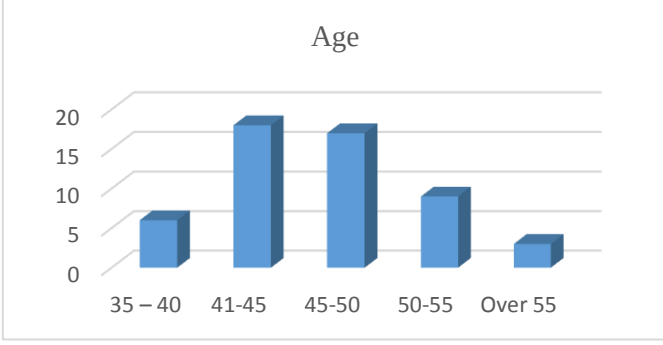

Figure-1. Frequency Distribution Regarding Professors' Age

Table-2. Frequency Distribution Based On Professors' Time of Activity

Variables	Frequency	Frequency Percentage	Valid Percent	Mean
5-10 years	5	10%	10%	19.3
11-15 years	17	34%	34%	
16-20 years	17	34%	34%	
21-25 years	7	14%	14%	
Over 25 years	4	8%	8%	
Total	50	100%	100%	

According to table 2, it is concluded that the time of activity of 10 percent of professors is between 5 to 10 years, the time of activity of 34 percent of them is between 11 to 15 years, the time of activity of 34 percent of them is between 16 to 20 years, the time of activity of 14 percent of them is between 21 to 25 years, and the time of activity of 8 percent of them is over 25 years. The mean of the professors' time of activity equals 19.3 years.

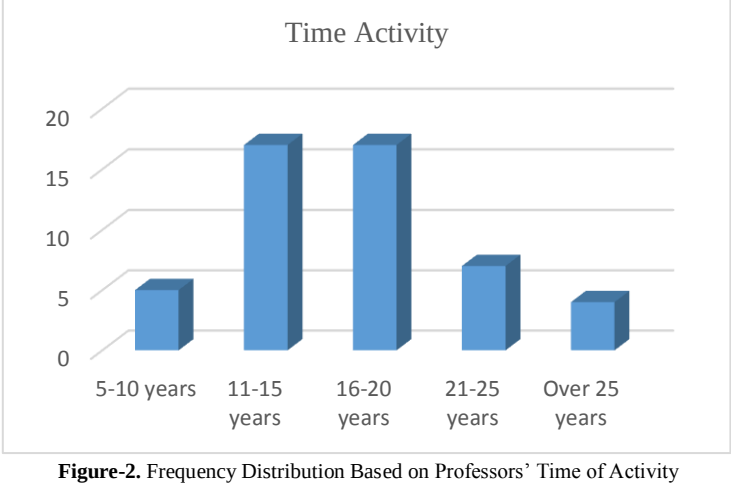

Figure-2. Frequency Distribution Based on Professors' Time of Activity

Table-3. The Estimation of Mean and Standard Deviation of the Effect of Applying Converging Technologies on the Organizational Behavior and Its Components

Variable	Mean	Standard Deviation
Improving employees' performance	4.02	0.654
Improving employees' learning and perception	4.06	0.651
Improving employees' motivation	4.02	0.742
Improving employees' quality of communications	4.06	0.738
Channing the strategy of the organization	4.06	0.682
Improving organizational culture	3.70	0.677
Methods of using organizational resources	3.64	0.631
Improving quality of organizational communications	3.60	0.638
Organizational behavior	4.14	0.639

According to table 3, the mean and standard deviation of effect of applying converging technologies on the organizational behavior and its components has been estimated. Regarding the coding of variables (1. Very low, 2. Low, 3. Moderate, 4. High, 5. Very high), the mean of all components is more than 3. In other words, the mean of effect of improving organizational behavior on applying converging technologies; improving employees' performance; improving employees' learning and perception, increasing employees' motivation, improving employees' quality of communications; and changing the strategies of the organization is more than 4, the number indicates the high and very high effect of applying converging technologies on the aforementioned cases. However, the effect of applying converging technologies on improving organizational culture; methods of using organizational resources, and improving organizational quality is between 3 to 4, these numbers indicate the fairly high effect of this technology on the aforementioned cases. The application of converging technologies has a significant effect on improving organizational behavior

H_0: The application of converging technologies does not have a significant effect on improving organizational behavior

H_1: The application of converging technologies has a significant effect on improving organizational behavior

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-4. The Descriptive Statistic

Effect of converging technologies on improving organizational behavior	Mean	Standard Deviation
	4.14	0.639

According to table 4, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving organizational behavior has been estimated. The mean value equals 4.14.

Table-5. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving organizational behavior	12.611	49	0.000

According to table 5, the experts' opinions on the effect of the application of converging technologies on improving organizational behavior has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (12.611) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the organizational behavior.

- The application of converging technologies has a significant effect on improving employees' performance

H_0: The application of converging technologies does not have a significant effect on improving employees' performance

H_1: The application of converging technologies has a significant effect on improving employees' performance

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-6. The Descriptive Statistic

Effect of converging technologies on improving employees' performance	**Mean**	**Standard Deviation**
	4.02	0.654

According to table 6, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving employees' performance has been estimated. The mean value equals 4.02.

Table-7. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving employees' performance	11.023	49	0.000

According to table 7, the experts' opinions on the effect of the application of converging technologies on improving employees' performance has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (11.023) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the employees' performance.

- The application of converging technologies has a significant effect on improving employees' learning and perception

H_0: The application of converging technologies does not have a significant effect on improving employees' learning and perception

H_1: The application of converging technologies has a significant effect on improving employees' learning and perception

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-8. The Descriptive Statistic

	Mean	**Standard Deviation**
Effect of converging technologies on improving employees' learning and perception	4.06	0.651

According to table 8, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving employees' learning and perception has been estimated. The mean value equals 4.06.

Table-9. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving employees' learning and perception	11.499	49	0.000

According to table 9, the experts' opinions on the effect of the application of converging technologies on improving employees' learning and perception has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (11.499) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the employees' learning and perception.

- The application of converging technologies has a significant effect on improving employees' motivation

H_0: The application of converging technologies does not have a significant effect on improving employees' motivation

H_1: The application of converging technologies has a significant effect on improving employees' motivation

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-10. The Descriptive Statistic

Effect of converging technologies on improving employees' motivation	**Mean**	**Standard Deviation**
	4.02	0.651

According to table 10, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving employees' motivation has been estimated. The mean value equals 4.02.

Table-11. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving employees' motivation	9.720	49	0.000

According to table 11, the experts' opinions on the effect of the application of converging technologies on improving employees' motivation has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (9.720) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the employees' motivation.

- The application of converging technologies has a significant effect on improving employees' quality of communications

H_0: The application of converging technologies does not have a significant effect on improving employees' quality of communications

H_1: The application of converging technologies has a significant effect on improving employees' quality of communications

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-12. The Descriptive Statistic

Effect of converging technologies on improving employees' quality of communications	**Mean**	**Standard Deviation**
	4.06	0.739

According to table 12, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving employees' quality of communications has been estimated. The mean value equals 4.06.

Table-13. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving employees' quality of communications	10.131	49	0.000

According to table 13, the experts' opinions on the effect of the application of converging technologies on improving employees' quality of communications has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (10.131) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the employees' quality of communications.

- The application of converging technologies has a significant effect on changing the goals and strategies of the organization

H_0: The application of converging technologies does not have a significant effect on changing the goals and strategies of the organization

H_1: The application of converging technologies has a significant effect on changing the goals and strategies of the organization

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-14. The Descriptive Statistic

	Mean	**Standard Deviation**
Effect of converging technologies on changing goals and strategies of the organization	4.06	0.682

According to table 14, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving employees' changing goals and strategies of the organization has been estimated. The mean value equals 4.06.

Table-15. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving employees' changing goals and strategies of the organization	11.499	49	0.000

According to table 15, the experts' opinions on the effect of the application of converging technologies on improving employees' changing goals and strategies of the organization has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (10.983) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the employees' changing goals and strategies of the organization

- The application of converging technologies has a significant effect on improving organizational culture

H_0: The application of converging technologies does not have a significant effect on improving organizational culture

H_1: The application of converging technologies has a significant effect on improving organizational culture

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-16. The Descriptive Statistic

Effect of converging technologies on improving organizational culture	**Mean**	**Standard Deviation**
	3.70	0.677

According to table 16, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving organizational culture has been estimated. The mean value equals 3.70.

Table-17. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving organizational culture	7.304	49	0.000

According to table 17, the experts' opinions on the effect of the application of converging technologies on improving organizational culture has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (7.304) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the organizational culture.

- The application of converging technologies has a significant effect on improving methods of using organizational resources

H_0: The application of converging technologies does not have a significant effect on improving methods of using organizational resources

H_1: The application of converging technologies has a significant effect on improving methods of using organizational resources

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-18. The Descriptive Statistic

	Mean	**Standard Deviation**
Effect of converging technologies on improving methods of using organizational resources	3.64	0.631

According to table 18, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving methods of using organizational resources has been estimated. The mean value equals 3.64.

Table-19. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving methods of using organizational resources	7.170	49	0.000

According to table 19, the experts' opinions on the effect of the application of converging technologies on improving methods of using organizational resources has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (7.170) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the employees' methods of using organizational resources.

- The application of converging technologies has a significant effect on improving quality of organizational communications

H_0: The application of converging technologies does not have a significant effect on improving of the organizational communications

H_1: The application of converging technologies has a significant effect on improving quality of organizational communications

In order to test the hypothesis in comparison with the average level of the mean of variable (number 3), the one-sample t-test is used, and then the relation is interpreted.

Table-20. The Descriptive Statistic

	Mean	**Standard Deviation**
Effect of converging technologies on improving quality of organizational communications	3.60	0.638

According to table 20, mean and standard deviation of the experts' opinions on the effect of the application of converging technologies on improving quality of organizational communications has been estimated. The mean value equals 3.60.

Table-21. Hypothesis Testing

Comparing with the fixed number of 3 at the average level			
Variable	**T-Statistic**	**Degree Of Freedom**	**P-Value**
Effect of converging technologies on improving quality of organizational communications	6.641	49	0.000

According to table 21, the experts' opinions on the effect of the application of converging technologies on improving employees' quality of organizational communications has been estimated, and then it has been compared with the average level.

According to the value of t-statistic (6.641) and the obtained error level less than 0.01 (P-value <0.01), it could be concluded that the relation between the above variables is significant at confidence level of 0.99. In other words, the null hypothesis is rejected, while the researcher's hypothesis is confirmed. Therefore, the application of the converging technologies has a significant effect on improving the employees' quality of organizational communications.

4. CONCLUSION

The converging technologies could lead to a scientific and technological renaissance. The renaissance is based on the vast understanding of the structure of the very small materials. The descriptive findings of the present paper show that the effect of applying converging technologies on improving organizational behavior is at a high level. Regarding the evolutionary power of such technologies on all aspects of the human's life, expecting such a result is not unbelievable.

Generally, eight hypotheses related to the effect of applying converging technologies on improving organizational behavior and its components has been tested and all of the hypotheses have been significant at confidence level of 99 percent.

5. SUGGESTION

It is suggested to the practitioners to develop a dynamic model of the emergence of positive affective similarity in work groups. For this, ''positive group effect spiral'' is proposed to continuously strengthen both the similarity of group members' positive effect and the quality of their interpersonal relationships in a dynamic process. This article suggests that applying this method, rather than assuming simple cause–effect relationships, would benefit from investigating dynamic, reciprocal relationships that might unfold into ''upward spirals''**.**

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