The Relationship between the Perceptions of Academic Staff in Mutah University of Technology Transfer and Mutah's University Organizational Readiness for Change

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Abstract

The purpose of this study is to verify the relationship between the dimensions of organizational readiness for change; motivational forces; institutional resources; staff attributes; and organizational climate, and the faculty perception of technology transfer. The study was applied on the context of the academic staff at Mutah University in the first semester 2011/ 2012. A questionnaire of 2 sections was distributed to the members of academic staff at Mutah University.The results of the study showed the academic staff at Mutah University sees the engagement in technology transfer is very important. Technology transfer awareness among them is considerably accepted and should be enforced. The organizational readiness for change was addressed in this study as insufficient this was attributed to the internal financial problems in the university and multiple environmental factors.The study showed that there is an approximately strong correlation between faculty perception of technology transfer and the dimensions of organizational readiness for change. The strongest relationship was appeared between the faculty perception of technology transfer and organizational climate.   The study recommended that the technology transfer process in the University should be fostered in order that the technology transfer is able to do its duties effectively and efficiently.

Keywords: technology transfer, organizational readiness for change, Mutah University

1 INTRODUCTION

In the last decade there has been a growing awareness to the value of university-industry collaboration in regard to innovation and technology development. The industry has become more open to mutual research projects with different partners. The old practice, where companies conducted their research only "in house" with their own means and facilities, has changed (Lambert, 2003). Globalization and hard commercial competition demands from companies to extend their range of products and specialists in order to remain competitive in the market. The need for expansion leads to a need for more research in different fields. Most companies have neither the capacity nor the financial means to conduct such researches "in house." In this new business reality, the universities present an ideal partner for research cooperation. The academic environment offers a fertile ground for innovation with a permanent exchange of young, innovative, up-to-date researchers. Nevertheless the universities are not always ready to this collaboration as it requires an organizational change due to the cultural gap between universities and companies which makes technology transfer process not a real success in many cases (Shane, 1997).

Although there has been considerable research on technology transfer from higher education institutions to industry in the West, little has been understood about the pattern and nature of such activities in Jordan. To fill this gap, as an

initial step, this study provides a framework for examining the readiness for change of Mutah University as a one of the most reputable Jordanian higher institutions and correlates it with the academic staff perception of technology transfer. Technology, with all of its ramifications, patents, licenses, know-how, special equipment, and so on, coupled with good management and adequate capital must be recognized as an important tool for industrial and economic development. Jordan is full of brilliant scientists who are capable to mobilize the technology transfer process in order to make use of it in the development of this country.

2 .THE RESEARCH PROBLEM, OBJECTIVES AND HYPOTHESES

In recent years Jordan has many scientists who have registered and commercialized locally and nationally many patents but it seems that Jordanian higher education institutions participate very little in this direction, although the process of technology transfer is a rewarding process for the university, researchers, students, the business community, the public, and the professionals who make it all happen (Nelsen, 2007).

Advancements in technology, the emerging systems of innovation in Arab World, globalization, the need to develop more universities' recourses coupled with flee of brains outside Jordan mean that universities have to evolve and regenerate in order to survive. This implies that universities should reconfigure themselves with structures which maximize their capacity for innovation.

2.1 State the Problem

This study seeks to investigate the organizational readiness for change and since in order to make technology transfer process successful in Jordanian universities; the organizational change is a must. The study also seeks to identify the academic staff's perception of technology transfer so as to relate it with the organizational readiness for change in order to improve the efficiency of technology transfer in one of Jordanian universities i.e., Mutah University. This study will help determine whether there is a relationship between the perceived organizational readiness for change by the academic staff in Mutah University and their perception of technology transfer process.

2.2 Research Aims and Objectives

The specific objectives of the study are as follows:

1. To determine the extent of the perception of academic staff in Mutah University (Engineering Faculty) of technology transfer process.

2. To determine the level of organizational readiness for change perceived by the academic staff in Mutah University (Engineering Faculty).

3. To investigate the relationship between the technology transfer process perceived by the academic staff of Mutah University (Engineering Faculty) and their perception of organizational readiness for change.

4. To identify the dimension of organizational readiness for change as perceived by Mutah University (Engineering Faculty) that mostly affects their perception of technology.

2.3 Research Hypotheses

The following hypotheses could be formulated:

H01: The academic staff in Mutah University has a low perception level of technology transfer process.

H02: The level of organizational readiness for change in Mutah University is low as considered by academic staff in Mutah University.

H03: There is no relationship between academic staff's perception of technology transfer process and organizational readiness for change in Mutah University.

H03-1: Agency needs has no relationship with technology transfer process as perceived by academic staff in Mutah University.

H03-2: Institutional resources have no relationship with technology transfer process as perceived by academic staff in Mutah University.

H03-3: Staff attributes has no relationship with technology transfer process as perceived by academic staff in Mutah University.

H03-4: Organizational climate has no relationship with technology transfer process as perceived by academic staff in Mutah University.

3. THEORETICAL FRAMEWORK

3.1 THEORETICAL BACKGROUND

Technology can contribute to the development of society, education, and economy of a nation through the discovery, transfer, diffusion, and application of new knowledge. Herschbach (1992) mentioned that in1987; Frey characterized technology as four elements: object, process, knowledge, and volition. According to Fery technology can be an object, a process, or knowledge that is created by human intention. In most cases, technology tends to be the integration of all three components: object, process, and knowledge. Therefore, a provider of technology should try to transfer the integration of all components that make up that technology, not just one component.

According to Rogers (2003), diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system and by which alteration occurs in the structure and function of a social system as a kind of social change. Diffusion of innovations should be conducted in a two-way direction because it is a collaborative and context-specific process based on a mutual understanding about an innovation. Thus, adopters of technology should actively participate in customizing technology to fit their unique situation by considering both positive and negative aspects of technology. In addition, generators of technology should try to transfer resources and capabilities needed in order to use, modify, and generate technology to its adopters so that diffusion will be successful. The three main aspects of technology practice are cultural, organizational, and technical (Pacey, 1986). Both the concept of maintenance and these three aspects of technology should be considered when making a technology transfer successful. However, most people tend to consider only the technical aspects, such as knowledge, skills, techniques, machines, and resources, in the technology transfer process. This lack of insight could be one of the biggest obstacles to making the technology transfer successful. Without a thorough analysis of both organizational and cultural issues related to technology, successful technology transfer cannot be expected.

Technology transfer implies the movement of physical structure, knowledge, skills, organization, values, and capital from the site of generation to the receiving site. In this study, the researcher attempted to configure the relationship between technology transfer and organizational readiness for change. Segman (1989), who conducted a historical review of technology transfer, traced the technology transfer process from the Neolithic times, the role of Arabs played in transferring technologies from East to West and the transfer of English textile expertise to the American textile industry in the 18th and 19th Centuries. Indeed, different approaches to shape and govern the technology transfer efforts have been seen. Few technology transfer models were developed after the World War II to govern the implementation of technology transfer activities and their application to marketplace. The U.S. Bayh- Dole Act of 1980 allows universities and other non-profit institutions to have ownership rights to discoveries resulting from

federally-funded research, provided certain obligations are met. In late 1980s and early 1990s technology transfer models have started to absorb the principles of the organization development movement (Sazali, et al., 2009).

As mentioned by Jacobi (2001), the Association of University Technology Transfer Managers (AUTM) offers an even more thorough description of the technology transfer process: technology transfer is a term used to describe a formal transferring of new discoveries and innovations resulting from specific research conducted at universities to the commercial sector. One way that universities transfer technology is through patenting and licensing new innovations. The major steps in this process include:

1. The disclosure of innovations.

2. Patenting the innovation concurrent with publication of scientific research.

3. Licensing the rights to innovations to industry for commercial development.

These steps are illustrated in figure (1) which represents the simplified process of technology transfer at universities

Fig. (1): The simplified process of technology transfer at universities (adapted from WIPO)
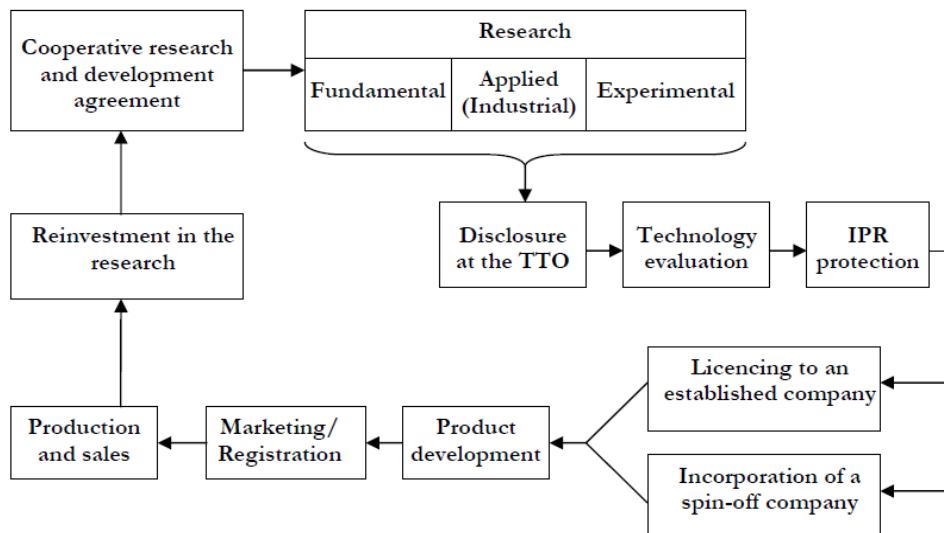
Pelish (2004) emphasized that the first step in the university technology transfer process is invention disclosure that is the recognition of a new technology developed by a faculty member, a graduate student, or a staff member of a university that is conveyed to the university's office of technology transfer under condition that the publication of the research findings to be delayed until the patenting process is started. Patenting of an invention provides the university ownership of the intellectual property rights and subsequent rights to license the patented technology to another organization. The next step as mentioned by Pelish (2004) occurs when an individual or organization secures a license from a research university for use or application of the patented technology. Depending on the commercial uses by the licenses of the technology the research university may begin earning income once a licensing agreement is entered into. Jacobi (2001) emphasized that the faculty lack the sufficient awareness and the understanding of the role of technology office process that implies in most case universities should make modification in order to overcome the resistance facing the success of technology transfer. The university policy makers could redefine their mission, vision, and core value statements across all units to carry a clearer and uniform message related to technology transfer and

commercialization as well as other aspects that are important to the university. So it is clear t that the technology transfer process is heavily dependent on the organizational readiness for change.

Armenakis' et al. defined "Readiness for change is the cognitive precursor to the behaviors of either resistance to, or support for, a change effort (Armenakis et al., 1993). Lehman et al. (2002) emphasized that ORC is a set of general factors that may be necessary but not always sufficient for change to occur. They developed an instrument to measure the organizational readiness for change based on four dimensions: motivation for change, institutional resources of the program, personality attributes of the staff, and organizational climate of the program. Motivational factors include program needs, training needs, and pressures for change, while program resources are evaluated in regard to office facilities, staffing, training, equipment, and internet. Organizational dynamics include scales on staff attributes (growth, efficacy, influence, adaptability) and climate (mission, cohesion, autonomy, communication, stress, flexibility for change) (Lehman et al., 2002). This instrument has been adopted in this study with minimal modifications to suit Mutah University as an academic institution.

3.2 Technology Transfer in Jordan

Currently, there are 8 public and 13 private universities in Jordan (the country has about 6 million inhabitants). These universities are mainly focused on theoretical teaching. Research activities play a minor role, especially not in applied research. Jordan has started one program to raise awareness on technology transfer. It is called Faculty For Factories (FFF), run by the Jordan Chamber of Industry (JCI). The aim of the project is to bring academic staff and industry together to solve special industrial problems. Barriers addressed by this program are on both sides: industry does not believe in academic staff as they are only theoretically oriented and academic staff is not interested as there is nearly no incentive.

There seems to be a good potential that Technology Transfer Centers can play a more active role in the Jordan NIS (National Innovation System), provided they receive a stronger political and financial backing than in the past.

Seidel et al. (2009) emphasized that technology transfer should become more important in Jordan. The potential and starting position is quite good since there is a certain number existing with close connection to the industry. However, readiness for public investments is the key to improve the performance of the Jordanian technology transfer centers. USAID Jordan Economic Development Program (SABEQ) has done an assessment on technology transfer in Jordan and stated that these centers would be capable to contribute to technology transfer (Seidel et al., 2009),

3.3 The Applied Field of the Study

Mutah University was founded in 1981 by a Royal Decree as a national institution for civil and military higher education. Mutah University is considered now as one of the biggest universities in the country with a total intake of nearly 16,000 students from all over the country and abroad (Mutah University)

The academic staff in Mutah University has reached approximately 529 members in the academic year 2005/2006 (Al-Hadath Newspaper).

The proportion of research projects to faculty members in the period (2000-2002), reached (2.75) in Mutah University. In December 2010 a 11 technology transfer branches offices (TTBO) were established Jordan, one of them was in Mutah University by the cooperation with SRTD (Support to Research and Technological Development and Innovation Initiatives and Strategies) in Jordan he Higher Council for Science and Technology and the Intellectual Property Commercialization Office at El Hassan Science City. The 11 new TTBOs, together with the IPCO, will create the base of a national technology transfer program that brings together all existing players in the country, by supporting both the research and industrial communities to cooperate in adopting the innovative research results to improve local

industry and businesses. Moreover, the branches will support investment in research results to create new companies and job opportunities in Jordan (SRTD).

3.4 Conceptual Model

Based on the literature review and previous studies, the researcher developed a conceptual depicted in fig. (2), as seen from the figure the four dimensions of organizational readiness for change (ORC) (independent variable) that are related the perception of technology transfer. In this model the four dimensions of the independent variable have been adopted from Lehman et al. study (2002) which has been developed based on a process model of technology transfer. The perceptions of technology transfer are measured based on the work of Jacobi (2001), Jacobi used a survey instrument requesting faculty opinion on various aspects and issues related to university technology transfer.

Fig. (2): Schematic diagram of the theoretical framework of the study
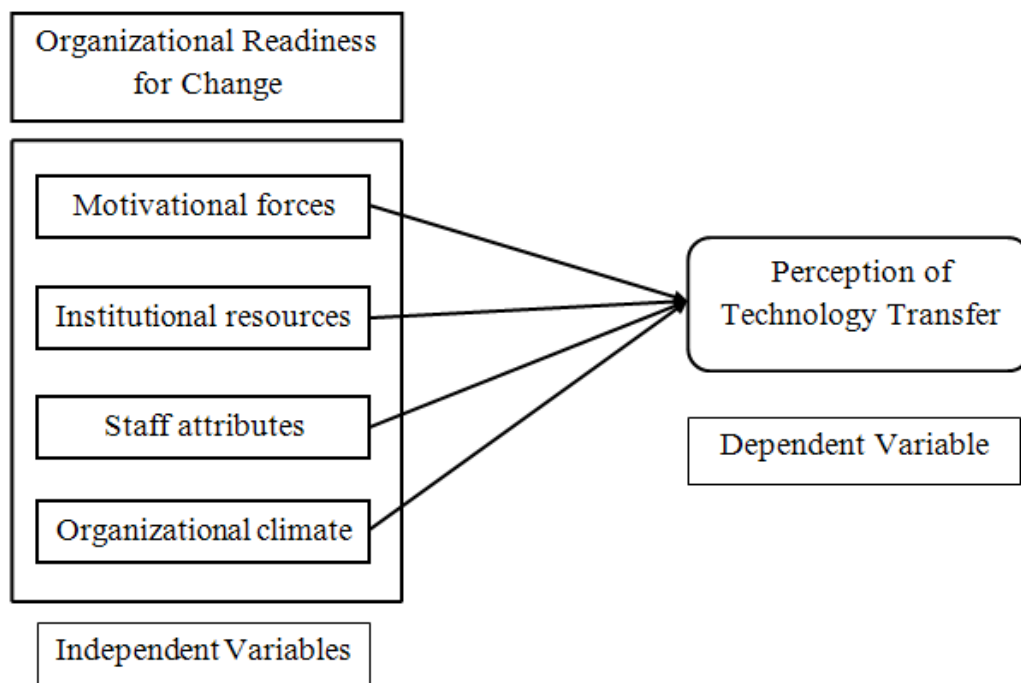
4 THE RESEARCH METHODOLOGY

4.1 Population and Sample

All the academic staff members in Mutah University who are not in sabbatical or in leave have been surveyed. The total number of academic staff in Mutah University in the first semester 2011/2012 equals 529. All these members will be surveyed.

4.1 Data Collection Procedures

The population was surveyed using 2 surveys:

The first one will investigate faculty opinions and perceptions on various aspects and issues related to university technology transfer which adopted from Jacobi (2001). The second survey will investigate the four dimensions of organizational readiness for change (ORC) adopted from Lehman et al. study (2002). The question will be modified by the researcher to suit the university context as the construct was developed in drug treatment organizations context.

4.2 Independent Variable

The organizational readiness for change (ORC) is the independent variable or predictor variable, it has 4 dimensions: Motivational forces, Institutional resources, Staff attributes, and Organizational climate. These dimensions are to be measured using the second questionnaire developed on the basis of Lehman et al. study (2002). Items (1, 5, 9, 13, 17, and 21) measure Motivational forces, Items (2, 6, 10, 14, 18, and 22) measure Institutional resources, Items (3, 7, 11, 15, 19, and 23) measure Staff attributes, Items (4, 8, 12, 16, 20, and 24) measure Organizational climate. The questionnaire is based on a Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree).

4.3 Dependent Variable

One of the primary objectives of this study is to gather information concerning faculty perceptions of university technology transfer. There are many factors that can be isolated and identified with successful university technology transfer activities such as:

a. Awareness of faculty-indicated by disclosure activity (reporting new inventions to the university technology transfer office);

b. Marketing and negotiating skills-indicated by increasing licensing activity;

c. Local economic development-indicated by evidence of support of new start-up companies and licensing to in-state businesses.

d. Licensing income- indicated by increasing income levels resulting from university transfer activities.

Because of the nature of the information sought is both descriptive and explanatory, the instrument selected is a survey developed by Jacobi (2001). A 5-point Likert-type scale was then attached to the appropriate questions, with responses from "strongly agree" to "strongly disagree".

5 THE RESEARCH FINDINGS AND DISCUSSION

As indicated in Table 1, the item with which the responding faculty agreed the most was "Technology transfer is important to my university." It received a mean rating 4.11 and a standard deviation of 0.78. Next came item no. 2 which states "It is appropriate for universities to be involved in technology transfer-related activities" with mean equals 3.89 and a standard deviation of 0.71. The item which received the third highest level of agreement was, "My University should place greater emphasis on applied (versus basic) research." This item received a rating of 3.80 (SD=0.76). The item that had the lowest level of agreement among the responding faculty was, " In the past tree month, I have read an article about the successful commercialization of one of our faculty's new inventions" (Mean rating= 2.07, SD= 0.86). The large number of "no opinion" category responses actually resulted from a large number of varied and weak agree and disagree responses to these items.

Table 1. Perceptions of Faculty Regarding University Technology

Response Category	SD	Mean	Item	id
AGR	0.78	4.11	Technology transfer is important to my university	1
AGR	0.71	3.89	It is appropriate for universities to be involved in technology transfer-related activities	2
AGR	0.76	3.80	My university should place greater emphasis on applied (versus basic) research	3
AGR	0.73	3.71	My university should encourage all faculties to attend a seminar/ training session on technology transfer	4

AGR	0.72	3.60	A technology transfer office is/could be a benefit to me	5
NOP	0.69	3.29	One or more of my colleagues has personally benefitted from technology transfer within the university	6
NOP	0.89	3.20	Within my department it is common it is common for faculty to discuss potential applications of our research	7
NOP	0.81	3.40	My university should encourage faculty to create new technologies /inventions	8
NOP	0.78	3.38	My university should be involved in technology transfer as it relates to its faculty's inventions, but should not use the process to profit monetarily	9
NOP	0.83	3.11	University technology transfer leads to private companies driving the direction of the research	10
NOP	0.99	2.80	The emphasis on technology transfer and applied research has had a negative impact on the quality of teaching within my university	11
NOP	0.91	3.27	Creation of inventions should be a consideration in tenure and promotion decisions	12
NOP	0.88	2.64	University involvement in technology transfer creates conflict among its faculty	13
NOP	0.89	2.98	The potential problems resulting from technology transfer activities outweigh the benefits to the university	14
NOP	0.82	3.22	I anticipate that I will need the services of the university technology transfer office at some point in my career	15
NOP	0.94	3.29	My university should be involved in technology transfer as it relates to faculty inventions, because it is a means of generating income to support research	16
NOP	0.87	3.09	Faculty should share in the profits resulting from their inventions	17
NOP	0.92	2.98	University technology transfer eliminates the free exchange of research information	18
NOP	0.88	3.04	It is appropriate that a portion of royalties earned from a faculty member's invention support my university's technology transfer office	19

NOP	0.86	3.18	A university technology transfer office can help get new inventions into public use	20
NOP	0.85	2.69	If I had freedom to choose whether to commercialize my research results of freely disseminate the information, I would opt the later	21
DIS	0.90	2.22	My institution has been successful at technology transfer	22
DIS	0.86	2.07	In the past tree month, I have read an article about the successful commercialization of one of our faculty's new inventions	23

Hypothesis 1

Ho: The academic staff in Mutah University (Engineering Faculty) has a low perception level of technology transfer process.

Table 2: Descriptive Statistics for perception of University technology transfer

SD	Mean	Max.	Min.	N	
12.28997	72.9556	97.00	48.00	45	Technology Transfer Valid N (list wise)

Table 3: t-test for perception of University technology transfer

t- critical (α=95%)	Mean Difference	df	t-calculated
1.684	-3.95556	44	2.159

Since the t-calculated for technology transfer equals 2.159 which is greater than the critical t value 1.684 at 5% significance level and 44 degrees of freedom, so the null hypothesis will be rejected and the alternate hypothesis will be accepted which means that "The academic staff in Mutah University has a low perception level of technology transfer process."

Hypothesis 2

Hypothesis 2 states that "The level of organizational readiness for change in Mutah University is low as considered by academic staff in Mutah University." In order to investigate this hypothesis, one should investigate the dimensions of organizational readiness for change each alone to conclude whether organizational readiness for change (ORC) is low or not.

Motivational forces

Motivational forces were covered by the items 1, 5, 9, 13, 17and 21 in the second questionnaire, Item 1 had the highest score with mean rating = 3.87 (SD = 0.79), the second highest score is item 13with mean rating = 3.18 (SD = .78) and the lowest item 21 with mean rating = 1.62 (SD = .78) as indicated by table 4.

Table 4: Motivational forces as a dimension of organizational readiness for change

Response Category	SD	Mean	Item	id
AGR	0.79	3.87	Your program needs additional guidance in matching needs with	1
DIS	1.07	2.24	You need more training for increasing your abilities	5
NOP	0.79	2.87	Current pressures to make program changes come from accreditation or licensing authorities	9
AGR	0.78	3.18	Current pressures to make program changes come from academic staff members	13
AGR	1.02	3.16	Your program needs additional guidance in raising overall quality	17
DIS	0.78	1.62	You need more training for using computerized apparatus	21

The descriptive data for motivational forces is illustrated in table 4, whereas the t-test for this dimension is illustrated in table 5

Table 5: Descriptive Statistics for Motivational forces as a dimension of organizational readiness for change

SD	Mean	Max.	Min.	N	
3.12581	16.8444	24.00	10.00	45	Motivational forces Valid N (list wise)

Table 6: t-test for Motivational forces as a dimension of organizational readiness for change

t- critical (α=95%)	Mean Difference	df	t-calculated
1.684	-1.15556	44	-2.480

It is obvious from table 6 that the t-calculated value for motivational forces dimension equals -2.480 which is lower than t- critical = 1.684 95% significance level and 44 degrees of freedom, so the study fails to say that motivational forces are sufficient enough to initiate organizational change.

Institutional resources

Institutional resources were covered by the items 2, 6, 10, 14, 18 and 22 in the second questionnaire, Item 18 had the highest score with mean rating = 4.07 (SD = 0.55), the second highest score is item 2 with mean rating = 3.24 (SD = 0.96) and the lowest item 10 with mean rating = 2.24 (SD = 0.72) as indicated by table 7.

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Table 7:   Institutional resources as a dimension of organizational readiness for change

Response Category	SD	Mean	Item	id
NOP	0.96	3.24	Your offices, Labs and equipment are adequate	2
NOP	1.13	2.80	Frequent staff turnover is a problem for the programs	6
DIS	0.72	2.24	The budget here allows staff to attend professional conferences each year	10
NOP	1.24	2.60	Computer problems are usually repaired promptly	14
AGR	0.55	4.07	You have easy access for using the Internet at work	18
NOP	0.94	3.04	More computers are needed in this program for staff to use	22

The descriptive data for Institutional resources is illustrated in table 8, whereas the t-test for this dimension is illustrated in table 9

Table 8: Descriptive Statistics for Institutional resources as a dimension of organizational readiness for change

SD	Mean	Max.	Min.	N	
2.52703	17.9778	24.00	13.00	45	Institutional resources Valid N (list wise)

Table 9: t-test for Institutional resources as a dimension of organizational readiness for change

t- critical (α=95%)	Mean Difference	df	t-calculated
1.684	-0.2222	44	-0.052

It is obvious from table 9 that the t-calculated value for institutional resources dimension equals   -0.052 which is lower than t- critical = 1.684 at 95% significance level and 44 degrees of freedom, so we fail to say that the institutional resources are sufficient enough to initiate organizational change.

Staff attributes

Staff attributes were covered by the items 3, 7, 11, 15, 19 and 23 in the second questionnaire, Item 3 had the highest score with mean rating = 4.02 (SD = 0.54), the second highest score is item 7 with mean rating = 3.78 (SD = 0.56) and the lowest item 15 with mean rating = 2.33 (SD = 0.95) as indicated by table 10.

Table 10:   Staff attributes as a dimension of organizational readiness for change

Response Category	SD	Mean	Item	id
AGR	0.54	4.02	You do a good job of regularly updating and improving your skills	3
AGR	0.56	3.78	You are effective and confident in doing your job	7
NOP	0.51	2.91	Staff generally regards you as a valuable source of information	11
DIS	0.95	2.33	You are willing to try new ideas even if some staff members are reluctant	15
DIS	0.89	2.44	You are sometimes too cautious or slow to make changes	19
DIS	0.94	2.29	You frequently share your knowledge of new ideas with other staff	23

The descriptive data for Staff attributes is illustrated in table 11, whereas the t-test for this dimension is illustrated in table 12.

Table 11: Descriptive Statistics for Staff attributes as a dimension of organizational readiness for change

SD	Mean	Max.	Min.	N	
2.88728	17. 7333	25.00	12.00	45	Staff attributes Valid N (list wise)

Table 12: t-test for Staff attributes as a dimension of organizational readiness for change

t- critical (α=95%)	Mean Difference	df	t-calculated
1.684	-0.26667	44	-0.63

It is obvious from table 12 that the t-calculated value for Staff attributes dimension equals   -0.052 which is lower than t- critical = 1.684 at 95% significance level and 44 degrees of freedom, so we fail to say that Staff attributes are sufficient enough to initiate organizational change.

Organizational climate

Organizational climate was covered by the items 4, 8, 112, 16, 20 and 24 in the second questionnaire, Item 3 had the highest score with mean rating = 4.02 (SD = 0.54), the second highest score is item 7 with mean rating = 3.78 (SD = 0.56) and the lowest item 15 with mean rating = 2.33 (SD = 0.95) as indicated by table 13.

Table 13:   Organizational climate as a dimension of organizational readiness for change

Response Category	SD	Mean	Item	id
NOP	0.63	2.87	Management here has a clear plan for different programs	4
NOP	0.72	2.40	There is too much friction among staff members	8
NOP	0.85	3.00	Staff members are given too many rules here	12
NOP	0.56	2.96	Ideas and suggestions from staff get fair consideration by top management	16
NOP	0.49	3.11	You are under too many pressures to do your job effectively	20
NOP	0.83	3.18	You are encouraged to try new and different techniques	24

The descriptive data for Staff attributes is illustrated in table 14, whereas the t-test for this dimension is illustrated in table 15.

Table 14: Descriptive Statistics for Organizational climate as a dimension of organizational readiness for change

SD	Mean	Max.	Min.	N	
2.22179	17.4667	24.00	14.00	45	Staff attributes Valid N (list wise)

Table 15: t-test for Organizational climate as a dimension of organizational readiness for change

t- critical ($\alpha=95\%$)	Mean Difference	df	t-calculated
1.684	-0.53333	44	-1.61

It is obvious from table 12 that the t-calculated value for Organizational climate dimension equals   -1.61which is lower than t- critical = 1.684 at 95% significance level and 44 degrees of freedom, so we fail to say that Organizational climate is ready enough to initiate organizational change.

From the preceding discussion one could conclude that we failed to reject the null hypothesis so, the level of organizational readiness for change in Mutah University (Engineering Faculty) is low as considered by academic staff in Mutah University (Engineering Faculty).

Hypothesis 3

H_{03}: There is no relationship between academic staff's perception of technology transfer process and organizational readiness for change in Mutah University (Engineering Faculty).

H_{03-1}: Agency needs has no relationship with technology transfer process as perceived by academic staff in Mutah University (Engineering Faculty).

H_{03-2}: Institutional resources have no relationship with technology transfer process as perceived by academic staff in Mutah University (Engineering Faculty).

H_{03-3}: Staff attributes has no relationship with technology transfer process as perceived by academic staff in

Mutah University (Engineering Faculty).

H_{03-4}: Organizational climate has no relationship with technology transfer process as perceived by academic staff in Mutah University (Engineering Faculty).

In order to test this hypothesis, Pearson product-moment correlation coefficient was used. Table 16 shows r-coefficient between University technology transfer and the various dimensions of organizational readiness for change.

Table 16: Correlation between technology transfer and ORC dimensions

Pearson Correlation coefficient	ORC Dimension
0.770	Motivational forces
0.693	Institutional resources
0.661	Staff attributes
0.791	Organizational climate

From table 16, it was noticed that Pearson Correlation coefficient is greater than 0.5 for all ORC dimensions which means that there is a strong relationship between ORC dimensions and University technology transfer. It also noted that the strongest relationship was between university technology transfer and organizational climate (r=0.791), the second strongest relationship was between university technology transfer and motivational force(r=0.770), in the last rank came the relationship between university technology transfer and staff attributes(r=0.661), while the relationship between university technology transfer and institutional resources had a correlation coefficient of 0.693.

6 Conclusions

Based on the findings of this study, the following conclusions were drawn by the researcher.

1. The academic staff at the Engineering Faculty-Mutah University sees the engagement in technology transfer is very important.

This conclusion is drawn from items 1 and 2 in the first questionnaire, this perception is important since this perception will drive the process of university technology transfer forward as it is the first step in collaboration between faculty of the technology transfer office. Because with the cooperation of the faculty, the technology transfer office can do nothing.

2. A considerable number of the academic staff at the Engineering Faculty-Mutah University is aware of technology transfer processes and policies.

Through reviewing items 9, 10, 17, 19 and 21 in the first questionnaire, one could notice that the faculty has a well idea about the different activities and policies related to technology transfer process such the subject of royalties, commercialization and the benefits moreover spin out companies. This perception implies that the faculty will be enhance the work of the technology transfer office in the future as it will reduce the time if explaining the policies and the procedure of technology transfer and will enforce the culture of technology transfer adoption in the university.

3. The majority of the academic staff at the Engineering Faculty-Mutah University does not think that the university is successful at technology transfer.

It is not hidden that the technology transfer office has not started it actual work yet and the perception of the faculty

that the university is not successful in the process of technology transfer may attributed to the fact that there are some regulations concerning the work of the technology transfer office have not been activated by the council of deans in Mutah University. This perception is clear from items 22, and 23.

4. It is obvious that the academic staff at the Engineering Faculty-Mutah University is interested in research specially applied research.

This perception is obvious from items 4, 7 and 8 since the faculty emphasized on the importance of research in general and the specialty of applied research and on participating in conferences which will foster the movement of research in the university.

5. The academic staff at the Engineering Faculty-Mutah University believes that the process of technology transfer might bring some problems.

From items 13, 14 and 18, it is obvious that the faculty sensed the problems that could result from the process of technology transfer such as delaying of publishing and the consequences on the teaching process and the conflict that may emerge between the faculty members because jealousy and unfair treatment from the office or the presidency.

6. From the study it is clear that the organizational readiness for change among the academic staff at the faculty of engineering in Mutah University is somehow not sufficient or weak as seen from the discussion of hypothesis 2, this may attributed to the fact Mutah University is passing through a critical time of financial shortage and the unstable conditions in the neighborhood countries which led to a state of uncertainty about the process of change. Also the regulations that have not been confirmed by the parliament concerning the benefits of big slice in the Jordanian community.

7. The strong relationship between technology transfer and the dimensions of ORC is of big importance, since this relationship is positive in its nature, so the more the academic were ready for change the more the process of technology transfer will be successful and the benefits of it.

7 Implications and Recommendations

The results of this study demonstrate the importance of technology transfer process for the University. Universities have established technology transfer offices to foster interaction with industry and commercialization of research. The shed the light on the perceptions of the academic staff of engineering faculty as the faculty members are the first customers of the technology transfer office. The process of technology transfer will not be successful without a strong independent technology transfer office and in order to establish such an office and activate it, the university should undergo through a process of change; change in organizational climate and change in corporate culture so there be an inertia that could drive the potential of the office forward in order to achieve the benefits anticipated from the process technology transfer.

It is recommended to expand the study to include all the academic staff in the various faculties in the university. Moreover, there should a comparison in order to investigate the case of Mutah University with other Jordanian universities especially with the University of Jordan.

It is recommended that the regulations related to the technology transfer office to be issued as soon as possible so as to help the office perform its work effectively and efficiently.

It is recommended that the technology transfer office continue its effort to spreading the knowledge of technology transfer to enhance the success opportunities for the university.

Finally the academic staff is encouraged to collaborate with the office in order to initiate the desirable change.

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