AN INNOVATIVE ORGANIZATIONAL APPROACH TO FACILITATE RESEARCH STUDIES IN UNIVERSITIES

Ergun Demirel*, Dincer Bayer**

Asst. Prof. Dr. Piri Reis University, Istanbul, Turkey*, Asst. Prof. Dr. Piri Reis University, Istanbul, Turkey**
E-mail: edemirel@pirireis.edu.tr*, dbayer@pirireis.edu.tr**

Copyright © 2016 Ergun Demirel, Dincer Bayer. This is an open access article distributed under the Eurasian Academy of Sciences License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Teaching and research are two main functions of universities. While teaching is supposed to be a regular activity in universities, research becomes a rising value which is taken into account as a factor defining the quality of the institutions.

Research capabilities add value to the reputation of a university as well as provide an important source to enhance availabilities. Research needs sufficient manpower, sources, dedicated time and a well-established organization to provide optimum use of available resources. This optimum use of resources requires effectively organized systematic procedures to follow. Therefore, effectiveness of research procedures applied in universities is needed to be measured from time to time.

This study aims to develop a method on measurement of research effectiveness by use of Brainstorming and Delphi methods applied in a group study. Brainstorming which is supported by a literature review to inform the participants of the brainstorming group about new approaches in this field is to define an innovative organizational approach to facilitate research studies in universities. Then, the Delphi method is applied to ensure the findings of Brainstorming.

The results of this study will help to realize the problem areas met in research studies in universities and develop proposals to be used to establish an effective organization to facilitate research studies by providing a suitable platform to strengthen the quality of researches.

Key Words: Research, Technology Development, Innovation, University Organization, Innovation in University, Techno Parks.

1. INTRODUCTION

The role of universities is changing to meet the new requirements of society in the 21st century. Although education is the primary mission of universities, research which is application of science and technology in support of businesses and industries called as a second function of universities has become quite important as well. The economy needs innovation which is the key element of the survival in a challenging world. Universities are one of the best places for innovation having many scientists, researchers and accumulation of knowledge. Industry has
already aware of this capacity and would like to cooperate, coordinate even collaborate with universities.

As the importance of research in the universities increase, they have started to reorganize their organization and management systems. Most of the universities created supplementary organizational modifications to increase their research activities without changing their orthodox structures. But later it has been understood that these kinds of minor modifications could not solve the problem and would not improve their research capabilities. So, they have started to create new organizations to enhance their capabilities for research.

The important improvement in the shaping the organization to meet the requirements for research was application of matrix organization. Universities have tried to establish a matrix organization for research groups based on the existing academic organization and have succeeded in their research function but to a certain extent.

The universities have established new units called as research, innovation, technology transfer centres or institutes and sometimes techno parks and incubators. The number of these units is increasing today and the both internal and external coordination of them becomes difficult. Additionally most of these units are headed and/or manned as twin mandate or part time and that complexity in management reduces the effectiveness of these research units (Demirel, 2015). The academic units are mainly organized as faculties or postgraduate institutes but the number of the faculties has been extremely increased and too many derivatives from a major science are created. The number of the faculties are now beyond the control capacity of a vice rector responsible for academic units. Although the optimal number varies from one firm to the next, many management writers agree that top management should directly supervise no more than four to eight people (Boone and Kurtz, 1987). The access number of the units are directly reporting to the head of the university or/whereas deputies complicated the control of the system and coordination between the subordinate units. In particular twin mandate reduced the productivity and sometimes created complication between subordinates.

In the European area, the higher education institutions are among the ‘key stakeholders’ in European research. According to the Commission, European universities employ one-third of European researchers and produce 80% of fundamental research in Europe (European Commission, 2005). EU Council has already established a new course of action namely Lisbon Strategy (European Council, 2000). This new strategy made an emphasis on the “research” activities in the community through the EU Lisbon Strategy for “economic growth and employment the EU”. In 2002 EU Council has decided raising overall expenditure on research and development to 3% of GDP by 2010 (European Council, 2002a and 2002b). In the light of this new strategy the government and public support has significantly increased and resources for research were improved. Accordingly, gross domestic expenditure on R & D (GERD) stood at EUR 272 billion in the EU-28 in 2013, which was a 0.7 % increase on the year before, and 43.8 % higher than 10 years earlier (in 2003) (Eurostat, 2015). Increased financial support in particular million dollar costs EU research projects directly affect the organization of the European universities. They have established new research units, increased the number of the lecturers/researchers dedicated for research only even established independent commercial/financial organizations to operate the research funds. They have accepted representatives from business and industry in their management boards/board of trustees as stake holders to empower university and industry cooperation. The number of the coordination offices of the industry in the university campuses has significantly increased.

The academic freedom is considered to be a fundamental aspect of the activities of the Universities in the European Union (EU). For example, the Magna Charta Universitatum talks:
‘Freedom in research and training is the fundamental principle of university life, and governments and universities, each as far as in them lies, must ensure respect for this fundamental requirement’ (European Universities Association, 1988). The lack of freedom hampers research activities in particular in social sciences. The political pressure on the state and sometimes in private universities hampers the research studies. The proposed (unratified) European Union Constitution (European Union, 2005) explicitly states in Article II-73 that ‘[t]he arts and scientific research shall be free of constraint. Contrary to this idea, there is another fact that more management and control means less free studies. Kernel (2009) says “academic freedom rarely mentions freedom from management as an important feature of academic freedom”. Considering this dilemma, the organization and management structure of universities should be set up as to be a flexible system which provides freedom for research activities. The orthodox structure of universities is the biggest obstacle to hamper freedom of research. The new organization for university should eliminate full control of the management in a university and university managers should leave their obsessive attitudes to control ‘everything’. But we should keep in mind that if management holds control of the financial resources they will be able to have full control on the research activities as well. This full control is a negative habit of managements and therefore, somehow the research units should have a right to control their budget and financial sources.

Although every institute accepts the importance of strategic management concept in new era, managers generally refrains to apply it may be because it is hard to realize it. The significant element of this concept is stakeholder approach. Freeman (2011) says this concept can be useful in integrating some of these issues (plans and systems of the plans for business level entities, role of the corporation in the social systems, social responsibility of the business, behaviour of the large group of the populations of the organizations and their environments) around the concept of organization strategy, that is around the issues of how organizations can configure themselves and take actions to align themselves with the environment. We need to adopt and apply new management system approaches. Unfortunately, universities are quite traditionally managed and have no intention of adopting new concepts which will be crucial to introduce ‘strategic direction’ and ‘strategic programme’ of the institute. Industry and business are more successful to adopt new management systems and if universities are late to accept this reality this will hamper the coordination and cooperation between them.

Every university has its own culture. It is maybe very easy to change the organization but not the organization culture. Mathis & Jackson (1988) states ‘The organization culture is highly important when establishing strategy, because appropriate strategies may be negated by incompatible culture’. The disharmony between organization and organizational culture may cause many disputes which may worsen the management. The universities also reconsider to review their organization culture when they have decided to review and revise their organization.

Henry Fayol defines the activities in organizations under six groups; technical (production), commercial (sales, purchase and procurement), finance, accounting, safety (security) and management (Kocel, 2007). Existing classical university organizations focused on the ‘technical management’ rather than the other functions. The increasing research activities introduced new commercial functions such as revolving/floating capital, contract management, sales etc. The new university organization should be strengthening to fulfil all these new functions.

We are living in a challenging competitive world. Globalism is everywhere (Beck, 2004). It is necessary to remove the term "national" from the higher education. Accordingly, universities enlarged their interest areas of education and research worldwide. There is an increased
worldwide demand for learning, advancing learning technologies, and growing competition among multiple providers, all seeking to gain competitive advantage. This also affects the organizational change and transformation. The following factors/conditions of new era should be taken into consideration for organizational change or transformation in universities:

- The increasing importance of relationship with society
- Not only national but also International completion in higher education
- Wide use of alternative teaching and learning system
- The role of competition in fostering innovation
- Collaboration in addition to cooperation and coordination
- Speedy change in technology
- Transformation rather than modification or minor changes

It should be apparent from this discussion that the organizational models presented are dynamic, and the boundaries between them are transparent or fluid. Clearly, all universities have the potential to become the educational equivalent of global multinational corporations that operate across national boundaries (Hanna, 1998).

The deterministic operating system is applied for the universities by the 1980s. This is a system which the attitudes are well known and generally static and based on definite rules and regulations. The new roles of the universities concerning condense research activities and cooperation with industry caused a drastic change on the operating system. The new systematic approach is probabilistic which the attitudes of the system cannot be predicted (Oygur, 2004). It would be better to consider a holistic solution. All the elements of the system should be reviewed and the solutions could be created on this analysis.

The new organization for university should meet the requirements of existing and future functions. The proposed organization should be carefully analysed and checked to ensure that it would be capable to meet all functions. The organization and management system should be considered together and both should match to the other. Therefore, the holistic solutions which provide an organization and management system should be sought.

The entrepreneurs need a Techno Park to improve their capabilities and secure competitiveness in challenging economy in the areas that could not be achieved by cooperating with universities only. The universities may be a part of Techno Parks and may provide support in improvement of new technologies and innovation. Unfortunately some universities in Turkey have established their own Techno Parks. Demirel, (2013) drew attention on this situation and stated that ‘Universities should give up to establish such organizations (Techno Parks) which are not functioning in their areas of responsibility and missions. Now there are strong industry associations, investors and financial institutions are available in the country to assume this function. The future role for our universities must take a place in the Techno Parks as a scientific institution and provide scientific research support. This will be more rational, realistic practice which provides a reliable input-outcome relationship between both sides. This new approach is commonly approved by the participants in the 6th National University-Industry Cooperation Platforms Congress with exception of representatives from some universities which already have a techno park. So, we will consider the Techno Parks under this concept. But it is a fact that research centres, incubators, technology offices are integral parts of a university.

Nowadays industry and university cooperation brought another dimension to switch from cooperation to collaboration. Collaboration means the action of working with someone to produce something and it differs from cooperation which means the association of person or business for common, usually economic benefit. The co-works in the university-industry activities mainly resemble the collaboration rather than cooperation as a nature of the work (Demirel & Bayer, 2015).
According to Carayannis (2000), university–industry relations gained new perspectives especially in the field of research and development in industrialized countries. Today, many countries all over the world are getting benefits of social and technological knowledge and research capabilities of universities in developing their wealth and prosperity in collaboration with their industrial capacity.

2. RESEARCH METHOD

The aim of this study is to create an innovative organization to facilitate research studies to provide optimum use of dedicated sources in a university without hampering teaching functions. This organization will also provide a suitable platform to strengthen the quality of learning in the institutions.

This study based on a brainstorming to define an innovative organizational approach to facilitate research studies in universities supported by a literature study to inform the participants of the brainstorming group about new approaches in this field.

The findings of the brainstorming will be grouped, triangulated and associated to be introduced in the discussion period. In order to eliminate some inconveniences of group study the Delphi method is applied for another group of experts to rehabilitate and correlate the findings of Brainstorming. The discussion period will cover an in depth investigation of both the findings of Brainstorming and Delphi study to find results and create proposals (Figure 1).

Figure 1: Research Method

The results of this study will help to realize the problem areas met in the research studies in universities and the proposals to establish an effective organization to facilitate their research studies without hampering teaching functions.

3. RESEARCH

The research studies have been done based on the following activities;

- Introduction of the resume of the literature study to Brainstorming Group,
- Brainstorming,
- Grouping, Triangulation and Association of the findings of Brainstorming,
- Application of Delphi method with participation of another expert group.

3.1. Introduction of the resume of the literature study to Brainstorming Group.

The information provided in the Introduction chapter has been presented to the Brain Storming
Group. Additionally, a briefing has been provided to bring Brainstorming procedures to participants. In order to avoid repetition, any details have not been included in this part and all the procedures will be explained below.

3.2. Brainstorming.

Brainstorming is a Prewriting technique of focusing on a particular subject or topic and freely jotting down any and all ideas which come to participants mind without limiting or censoring information (Beacon Learning Centre, 2003).

In according to Osborn; ‘Brainstorm means using the brain to storm a creative problem and to do so in commando fashion, each stormer audaciously attacking the same objective’. The suggested brainstorming principles of Osborn are simple (Scannel & Mulvihill, 2014);

- Focus on quantity instead of quality
- Allow no criticism
- Welcome to fetched ideas
- Build upon each other ideas

The Brainstorming Group has been established by 11 lecturers holding PhD degree teaching in three different universities. Five of them teach science (engineering and physics), six of them teach social sciences (management and economics) and all have at least 5 years teaching experience in the universities.

They have been informed that they would never introduce opposite views for the views introduced by other group members but a new view as a rule for the brain storming. But they had the rights to introduce their opinions if they did not support any idea interpreted by another group member.

No criticism or opposition was allowed during brainstorming. But we also intended to have opinions of the participants on findings of the brainstorming. In order to realize that objective, a supplementary part has been added after the brainstorming process. The findings of the brainstorming were resumed in a paper and distributed to the participants and they were asked to introduce their opinions about the findings if they agree or not. The participants have covertly responded this part. You will also see the number of the participants who are agree or disagree with the opinion just at the end of each finding in parenthesis.

They have been asked the following 4 groups of questions;

- What are the expectations of university from research?
- What kind of an organization you propose for better quality of research in university?
- Which benefits may be gained from the cooperation and coordination between university and business/industry?
- Do you believe that the university should have a techno park or similar unit for research activities?

3.2.1. Expectations of university from research?

The following answers have been provided by the group members. The number of the supporters/non-supporters is defined in parenthesis.

- The research studies add a significant value to the reputation of a university (9/2)
- The research activities provide better financial resources to university (7/4)
- The research activities improve the quality of the lecturers (8/3)
- The research improves the quality of teaching and learning (11/0)
- The research studies improve teaching aids (laboratories/simulators/workshops etc.) (9/2)
The research studies provide additional income for lecturers (6/5)
- The research studies provide cooperation with industry and business (8/3)
- The research studies are tools to present themselves to society (8/3)
- The research studies are tools to recruit more students (7/4)
- The research studies are tools to recruit better quality students (7/4)
- The research studies facilitate the cooperation with other universities (6/5)
- The research studies directly add values to country’s technologic development (9/2)

3.2.2. What kind of an organization you propose for better quality of research in University?
- A matrix organization in line with academic organization is suitable (6/5)
- A separate organization (research centre) which is totally out of academic organization is suitable (5/6)
- A separate core organization which will coordinate and co-operate research studies is suitable (9/2)
- Each academic unit (faculties) should have their research organization (4/7)
- A board consists of representatives of each academic units headed by a vice rector should be responsible for all research activities (6/5)
- An Ad Hoc group should be established for each research activity and should be supported by a standing organization responsible to provide administrative and financial support (7/4)
- A separate non-academic organization to handle relations with society (business, industry and NGOs etc.) and responsible for accounting, budgeting and finance for research activities is also required (7/4)

3.2.3. Which benefits may be gained from the cooperation and coordination between University and business/industry?
- University may follow the last improvements in the industry and modify education programmes (9/2)
- University may learn unrevealed information from the industry (8/3)
- University may provide financial support for enhanced research activities from the industry (9/2)
- Industry may get benefit from the knowledge accumulation in the universities in particular libraries (10/1)
- Industry may get benefit from the experiments of the scientists in the university (11/0)
- Industry may get benefit from the laboratories and simulators in the university (10/1)

3.2.4. Do you believe that the university should have a techno park or similar unit for research activities?
- Yes, university should have a techno park (8/3)
- University should have incubation centres (7/4)
- University should support Techno Parks (7/5)
- Techno Park needs to cooperate with university(s) to develop technology (9/2)
- The industry which needs innovation requires research rather than universities (6/5)

3.3. Grouping and Association of the findings.

3.3.1. The expectations of university from research.
- The research studies are tools to present themselves to society, add a significant value to the reputation of a university and help to recruit more and better quality students
- The research activities provide better financial resources to university and lecturers
The research activities improve the quality of the teaching/learning and lecturers
The research studies improve both teaching aids and scientific research tools
(Laboratories/simulators/workshops etc.)
The research studies facilitate cooperation with other universities industry and business

3.3.2. Organization proposal for better quality of research in university.
- Form 1: A matrix organization in line with academic organization (without hampering integrity, additionally a separate core organization which will coordinate and co-operate research studies is suitable
- Form 2: A separate non-academic organization to handle relations with society (business, industry and NGOs etc.) and responsible for accounting, budgeting and finance for research activities is also required
- Form 3: Each academic unit (faculties) should have their research organization, but an authorized board consists of representatives of each academic units headed by a vice rector should be responsible for all research activities

In support of Form 1, 2 and 3: An Ad Hoc group should be established for each research activity and should be supported by a standing organization responsible to provide administrative and financial support

3.3.3. Benefits of cooperation and coordination between university and business/industry.
- University should follow the last improvements in the industry and modify education programmes
- University may provide financial support for enhanced research activities from the industry and provide unrevealed information from the industry
- Industry may get benefit from the experiments of the scientists, laboratories and simulators, knowledge accumulation in the universities in particular libraries
- Special arrangements which balance the benefit of university and industry from research

3.3.4. Techno Park and University.
- Techno Park needs to cooperate with university to develop technology.
- The industry needs innovation and needs to have a techno park
- University needs to handle researcher centres or incubators but not Techno Parks
- Techno Parks provide better advantages for university-industry cooperation

3.4. Application of Delphi method with participation of another expert group.

One of the critical factors which hamper the group studies is existence of some dominant people in the team. They dominate the group and enforce acceptance their own ideas. The abstaining people in the group generally hesitate to declare their opinions and the opinion of the dominant peoples override overall group study. The Delphi method is created to keep away from such a genesis. This method reduces the influence of dominant people and provides an opportunity for timid person to introduce their opinions which may seriously affect the results of the study.

The Delphi method has been carried out in 3 different groups each consists of 3 to 4 lecturers holding PhD degree teaching in three different faculties. First group is specialized on management and economics, the second group on engineering, the last group on a profession which is based on both engineering and management.

A survey based on the findings of the brainstorming has been sent to three groups by expert groups’ leader who is responsible to handle application of Delphi. The experts groups have sent
their reports back to the leader. The leader compiled the reports, reviewed, eliminated discrepancies and sent them back to a consolidated report groups. The groups have reviewed the consolidated reports and send back their feedback to the leader. The leader has prepared the final report based on feedback from the groups avoiding any personal inputs.

In order to reduce the volume of the study only the final report will be introduced in this section. The significant results in the final report are introduced under the headlines in the previous section as follows;

3.4.1. The expectations of University from research.

- The research studies are important for reputation of a university in both national and international arena. To become reputable the universities should participate into international research activities. The reputation is essential to recruit more and better quality students which are vital for private universities to survive
- The universities may get significant financial benefits from research activities. That also provides better financial support for lecturers. This provides university to recruit best quality lecturers.
- The research activities improves the capacity and quality of the lecturer and that develops the quality of teaching/learning in the university
- The financial sources gained from research studies should be used to improve scientific research tools (laboratories/simulators/workshops etc.) rather than any other purposes
- The universities should give more importance to improve their capabilities for cooperation coordination and collaboration activities with other universities industry and business. These are essential elements to find better research opportunities and get benefit from available funds.

3.4.2. Organization proposal for better quality of research in university.

- Form 1: A matrix organization in line with academic organization (without hampering integrity, additionally a separate core organization which will coordinate and co-operate research studies is suitable
  DISAGREE: This system has already been trailed but it did not worked
  AGREE: Agreed but the application of matrix system should be improved and the discrepancies met should be removed.
- Form 2: A separate research organization out of academic organization, to handle research and relations with society (business, industry and NGOs etc.) and also responsible for accounting, budgeting and finance for research activities is also required
  DISAGREE: It may hamper the smooth operation of academic system. Most universities have no sufficient number of lecturers. It may also create a ‘Too many chiefs no Indians’ situations.
  AGREE: Agreed but the relations between academic unit and this new unit should be clearly explained to avoid any disharmony and conflict of interest
- Form 3: Each academic unit (faculties) should have their research organization, but an authorized board consists of representatives of each academic units headed by a vice rector should be responsible for all research activities
  DISAGREE: Many research activities need the participation of different professionals. If there is not a central control authority, such a system may cause domination of a definite unit on the research activities.
AGREE: Let us try it and see how it works. Then try to eliminate discrepancies and rearrange the system.

- In support of Form 1, 2 and 3: An Ad Hoc group should be established for each research activity and should be supported by a standing organization responsible to provide administrative and financial support.

DISAGREE: Ad Hoc groups are not assumed to be a part of formal organization and Ad Hoc group studies are generally not successful.

AGREE: If Ad Hoc groups are established with a clear term of reference and manned with suitable persons it will work. It is not so successful in our culture but worth to try. As a result, there is no new organization proposal from participants.

3.4.3. Benefits of cooperation and coordination between university and business/industry.

- One of the main missions of the university is to provide qualified manpower for industry so that University should then establish better links with industry and business to realize the real requirements and reshape education programmes.
- University needs financial support and more detailed information including unrevealed information from industry to achieve better research activities.
- Industry has not sufficient sources for research and development and this may easily be compensated from universities by the way of deploying the scientists using laboratories, sharing knowledge accumulation and libraries.
- There is a strong need to establish coordination units and special procedures to achieve that goal.
- The universities should have a unit to handle financial, bidding and budgeting unit for research activities to ensure the return of investment.

3.4.4. Techno Park and University.

- The universities should avoid establishing a Techno Park but take a place in the suitable Techno Parks,
- Techno Park concept is suitable to develop new technologies taking advantage from scientific studies,
- University needs to handle researcher centres, technology development centres and incubators,
- Techno Parks provide better advantages for university and industry to find suitable partners which fit their purpose and provide better coordination.

4. DISCUSSION

The discussion period covered the investigation of both the findings of Brainstorming and Delphi study to find results and create proposals. The results have been grouped in three categories;

- The results which are agreed in both studies,
- The results contrary to each other in both studies and
- The independent results in both studies.

4.1. The results which are agreed in both studies.

The expectations of university from research.

- The research studies are important for reputation of a university in both national and international arena. The universities should also participate into international research activities. The reputation is essential to recruit more and qualified/better quality of lecturers and students which are vital for private universities to survive.
AN INNOVATIVE ORGANIZATIONAL APPROACH TO FACILITATE RESEARCH STUDIES IN UNIVERSITIES

- The universities may get significant financial benefits from research activities which are vital issues for private universities to survive as well as public universities to improve their capabilities for the quality of teaching/learning and research.
- In order to find partners and financial sources, universities should improve cooperation, coordination and collaboration with industry and business.

**Organization proposal for better quality of research in university.**

- A matrix organization in line with academic organization and a separate core organization directly involved in research which will coordinate and co-operate research studies is suitable.
- A separate research organization out of academic organization, to handle research and relations with society (business, industry and NGOs etc.) and also responsible for accounting, budgeting and finance for research activities is to be established. But the TOR (Term of Reference) for this should be very clear any disharmony and conflict of interest with academic organization.
- Each academic unit (faculties) should have their research organization, but an authorized board consists of representatives of each academic units headed by a vice rector should be responsible for all research activities.
- An Ad Hoc group should be established for each research activity and should be supported by a standing organization responsible to provide administrative and financial support. In order to get a successful result from Ad Hoc group studies, the combination of the group should be suitable for task and the tasks should be clearly defined in the TOR.
- In the Western World the universities are grouped in two categories; applied science and scientific universities. The best place for large scale scientific studies is scientific universities rather than applied science. The applied science universities may also conduct research activities in a limited extent. Two different organizations should be applied for these two type universities to support research activities depending upon the capacity of the universities.

**Benefits of cooperation and coordination between university and business/industry.**

- We should keep in mind that one of the main missions of the industry is to provide qualified manpower for industry. The university should establish close cooperation with industry and business to follow the recent improvement and realize the real requirements to review and redesign their education programmes.
- University and industry need each other for complementing their shortcomings. University needs financial support and more detailed information including unrevealed information from industry to achieve better research activities. Industry may get benefit to improve their limited sources for research and development by sharing scientists, facilities, knowledge and accumulation in the universities.
- The special organization and procedures should be established to achieve coordination and cooperation between industry and university.
- The measurement of cost effectiveness and pricing the work provided for the industry need a unit which has skills on these issues. It is advised that the universities should have a specific unit to assess cost effectiveness and pricing before assuming the responsibility of any work which will be served for industry or business.

**Techno Park and University.**

- The universities need to handle researcher centres, technology development centres and incubators rather than operating a techno park.
- If a university already operates a techno park, they should continue to work.
- Techno Park concept is suitable to develop new technologies taking advantage from scientific studies in both university and technologic improvements in industry.

4.2. The results contrary to each other in both studies.

The expectations of university from research.

There is no contrary view.

Organization proposal for better quality of research in university.

- Con-Matrix Organization: It has already been trailed and found not to be successful. It can be applied if all discrepancies are removed.
- Con-Separate Research Organization: Many universities have no sufficient staff to achieve their teaching/learning duties. It may be achieved if there are sufficient number of lecturers and researchers. The top management should establish a strict control on both sides to avoid domination of one group on the other.
- Con-Ad Hoc Groups for research: Ad Hoc system is not suitable for our culture, but let try it to some extent.

Benefits of cooperation and coordination between university and business/industry.

- The universities should have a unit to handle financial, bidding and budgeting unit for research activities to ensure the return of investment. Otherwise the research activities will lose their charm.

Techno Park and University.

- If a university already operates a techno park, they should continue to work.
- The universities should participate into Techno Park activities if the activities fit their purpose and area of interest.
- Most of the universities have no experiment for pricing the work they provide. The universities should be very careful when pricing the work for industry. It is advised that the universities should have a specific unit to assess cost effectiveness and pricing.

4.3. The independent results in both studies.

- The universities should be grouped in two categories; applied science and scientific universities. The best place for scientific studies is scientific universities rather than applied science. The applied science universities may also conduct research activities in a limited extent. Two different organizations should be applied for these two type universities to support research activities.
- The measurement of cost effectiveness and pricing the work provided for the industry needs a unit which has skills on these issues. It is advised that the universities should have a specific unit to assess cost effectiveness and pricing before assuming the responsibility of any work which will be served for industry or business.

5. CONCLUSION

The conclusion is based on the expectations of universities from research, the organizational proposal for better quality of research in university, mutual benefits of cooperation and coordination between university and business/industry and, operating techno parks- research centres- incubators.

The expectations of university from research.

- The reputation of a university in both national and international arena is essential to recruit more and better quality of lecturers and students which are vital for private universities to survive. The participation into international research activities will improve the quality of research as well as quality of teaching and learning.
The coordination forum and platforms are vital to find suitable partners and valuable projects improve research quality and revenue from research activities.

**The organization proposal for better quality of research in university.**

Four type organizations to support research activities in the university are proposed with some conditions/ restrictions;

- A matrix organization in line with academic organization and a separate core organization directly involved in research which will coordinate and co-operate research studies,

- A separate research organization out of academic organization is to be established to handle research and relations with society (business, industry and NGOs etc.) and also be responsible for accounting, budgeting and finance for research activities. But the TOR (Term of Reference) for this unit should make clear any disharmony and conflict of interest with academic organization.

- Each academic unit (faculties) should have their research organization, but an authorized board consists of representatives of each academic units headed by a vice rector should be responsible for all research activities.

- Ad Hoc groups should be established for each research activity and should be supported by a standing organization responsible to provide administrative and financial support. In order to get a successful result from Ad Hoc group studies, the combination of the group should be suitable for task and the tasks should be clearly defined in the TOR.

In the Western World the universities are grouped in two categories; applied science and scientific universities. The best place for large scale scientific research studies is scientific universities rather than applied science. The applied science universities may also conduct research activities in a limited extent. Two different organizations are to be proposed to be applied for these two different type universities to support research activities depending upon the capacities of the universities.

- For applied science universities Matrix Organization or Ad Hoc research groups are proposed.

- For scientific universities a separate research unit is considered to be suitable. Each academic unit (faculties) may have their research units depending upon the capacity of facilities or number of researchers.

**The mutual benefits of cooperation and coordination between university and business/industry.**

The universities should never underestimate their mission to provide qualified manpower for industry. In fact the applied science universities/departments should focus on this mission rather than research. The programmes applied in the universities should be in line with requirements of industry and business. To achieve that close cooperation between university and industry/business should be established.

It should be clearly understood that the university and industry need each other for complementing their shortcomings. The financial support and provision of commercial unveiled information for universities are rather important to improve academic research quality. Better equipped research studies in universities will provide innovation opportunities for industry which is vital in a challenging world. The sharing scientists, facilities and knowledge in both sides will improve technologic capabilities of the country.

The special organization and procedures should be established to achieve an effective coordination and cooperation between industry and university. The universities have no
sufficient experiment on commercial practices in particular pricing, bidding and procurement methods. The cooperation and coordination with industry requires the universities to have special units to assume commercial activities.

Operating techno parks- research centres- incubator.

The universities need to handle researcher centres, technology development centres and incubators rather than operating a techno park. Operation of a techno park is a complex and delicate work needs commercial experiment which is beyond area of interest of a university.

So, the universities already operate a techno park, should review benefits and cost effectiveness of this operation and if it is reasonable they should continue to work.

Techno Park concept is suitable to develop new technologies taking advantage from scientific studies in both university and technologic improvements in industry. The universities should participate into Techno Park activities if the activates fit their purpose and area of interest.

Finally.

In this study many proposals are introduced to form organizations to improve research quality in the universities. The universities may improve their own system taking into account their mission, vision and availabilities.

REFERENCES


Beacon Learning Center, (2003). Definitions and examples of prewriting steps of brainstorming, clustering and questioning(www.beacomlearningcenter/documents1044_1.pdf )


European Commission (2002a): Higher Education and Research for the ERA: Current Trends and Challenges for the Near Future (October), CORDIS Report by the STRATA-ETAN Expert Group set up by the European Commission


