Promotion of Innovation Culture in the Higher Education in Jordan
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PROMOTION OF INNOVATION CULTURE IN THE HIGHER EDUCATION IN JORDAN – INVENT

A REPORT ON WP1: ANALYSIS OF TRAINING NEEDS

DONE BY WP LEADER: JUST

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1. EXECUTIVE SUMMARY

This report constitutes an analysis of the WP1 of the "Promotion of Innovation Culture in the Higher Education in Jordan (INVENT)"; an Erasmus+ project, which aimed at identifying the needs of the local industries from the Centers for Transfer of Innovation (CTI). Two surveys were developed; one for the industry, and the other for academia. Both surveys focused on identifying the barriers between the industry and academia in Jordan in order to develop a mechanism to bridge the gap between academia and industry. More than 125 surveys for the different industrial sectors and more than 130 from different higher education Institutes (HEIs) in Jordan have been analyzed. The analysis of the data will enable us identify the local needs for training of the staff who will be working in the CTI, thus, training programs will be developed by our EU partners accordingly.

2. INTRODUCTION

The importance of relations between universities and their socio-economic environment has become a topical issue in Europe in the last two decades, and has also been stressed within the implementation of the Bologna process. Because of the limitation in natural resources and the relatively weak innovation-based industries, Jordan is expected to face economic difficulties during the next few years. Moreover, the rapid growth in population due to the normal increase and the forced migrations due to the political unrest in the region are expected to put the Jordanian economy under substantial pressure. The Jordanian economy is a developing-economy with most of its GDP comes from the services sector. The current national strategies focus on enhancing manufacturing and raising production in order to achieve a sustainable economic growth. According to the most recent (2013-2017) National Policy and Strategy for Science, Technology and Innovation, the weak coordination between the stakeholders of innovation, the lack of innovation and entrepreneurship culture, and the technological backwardness are some of the obstacles and weaknesses that hinder the contribution of innovation in the Country's economy.

Whereas in most European countries, relations between Universities and industries have been developed and intensified during the past decades, Jordanian Universities just recently recognized the importance of building bridges with the local industry and most of them have started to create strategies and instruments in this domain. Local industries in Jordan lack the instrument to create competitive-edge products and compete in the global market that is expanding rapidly. Many Jordanian enterprises have realized the importance of employing innovation in their business in order to survive the global competition. However, these enterprises are still reluctant to build real collaboration with the Jordanian universities; probably due to the lack of trust and lack of proper communication tools between the two sides.

Generally speaking, In Jordan, universities are expected and supposed to be in a leading position in issues related to technology transfer and innovation fostering. Thus, in order to take the innovation and

technology transfer in Jordan to the next level, we want to promote the innovation culture in these universities and create strong partnership with Jordanian industrial and business sectors. This will be achieved by expanding and enhancing the connection between the scientific research findings, enterprises and business sector and building effective partnership with the well-known universities and innovation centers in Europe. There is a big gap between the scientific production in Jordan and the business sector; this can be related to the weak contact between the academic and industrial sectors, the small market size, and a belief in many small businesses that there is no need for improvement and development. These problems can be overcome by building an informational and infrastructural system that can determine the needs of the local market and link it with the research priorities, creating a mechanism that can help the enterprises to work on innovative bases and establishing a training course/system for innovation and entrepreneurship culture. The Higher Council of Science and Technology (HCST) in Jordan took the initiative to promote the culture of innovation in Jordan with the emphasis on the higher education. Through some EU project; e.g., SRTD I&II, the HCST has established many technology transfer offices (TTO) across Jordan. However, these offices could not contribute to bridging the gap between the higher education institutions and the enterprises, even they could not promote the culture of innovation in their institutions. Recently, the HCST has started an initiative to "incubate" all activities related to innovation in one center in order to integrate the scattered efforts by all players and stakeholders in the innovation ecosystem, and share with them a well prepared roadmap that they can be used to achieve their goals.

INVENT, is an EU funded project through Erasmus+ Project, that concentrates on strengthening and enhancing the role of higher education institutes and universities in innovation capacity building, technology transfer and commercialization of applied scientific research outcome in Jordan. The focus in this project is on innovation and its requirements and tools. This project aims at institutionalizing innovation, technology transfer, and capacity building within the Jordanian universities so that they become a pillar in the development of the national economy. This will help to utilize the abundant scientific research production in two ways; first by giving the chance to the researchers to apply their research results, and second by providing clear view of the technological need of the local industries so that the research and researchers priorities can be well identified. To achieve the aforementioned objectives, a reliable database of the innovative research projects at the universities and the problems facing the enterprises and needs, an innovative solution will be created. Another important objective of this project is to enhance the sector of innovation and technology transfer through capacity building of staff and raising the awareness of the innovation importance among the university's researchers and the local businesses.

The project aims and objectives will be achieved via establishing Centres for Transfer of Innovation (CTI) at selected Jordanian universities. The centres will help in implanting and further development of the National Policy and Strategy for Science, Technology and Innovation which is the base of all currently on going and planed innovation support activities. The development of a framework for supporting entrepreneurs to help them getting their innovative ideas transferred into the markets is very essential. This framework may serve as a common model of Innovation and technology transfer centres in Jordan, to establish cooperation between representatives from researcher, student and business sectors and

investors. INVENT project will enable the CTI to support reality-related introduction of research results into the educational processes and industrial application.

Another important objective of this project is the development of economic thinking and interest to use of innovation by entrepreneurs and business community to form a base for human development in the sector of innovation and technology transfer through personal training and raising the awareness of the innovation importance among the university researchers and the local businesses.

In order to develop an efficient capacity building plan for the staff in the CTI, analysis of the local needs is very important, where feedback from higher education institutions and local industries will be the basis for identifying the local needs.

3. METHODOLOGY

In order to identify the needs the local needs for the CTI, two surveys have been developed carefully; one survey targeted the faculty members in the different Jordanian universities, and another one targeted the local industries.

The two surveys were revised by the INVENET Quality Committee before they were circulated. The final surveys are shown in Annexes I and II.

The faculty members' survey was developed after visiting many surveys conducted in other countries. The survey comprises of three sections:

1. General: which includes data about the faculty member: age, rank, university, etc., etc.

2. Previous experience with industries: which includes evaluation of previous experience of the respondent with the industry

3. The general opinions on: reasons for the week relationship with the industries; reasons for not undertaking industrial projects; etc.

The survey was uploaded to Google using Surveys Templates and faculty members were asked to fill in the survey on line. The target number of surveys was 100 participants; and the actual number of participants was 130.

The local industry survey was developed by collaboration between JUST and Amman Chamber of Industry (ACI). The survey comprises of three sections:

1. General: which includes data about the company, the respondent, etc.

2. Previous experience with universities: which includes evaluation of previous experience of the respondent with the universities

3. The needs of the local industries

In order to obtain enough feedback from the industry, JUST team, with the Applied Scientific Research Fund (ASRF) and MONOJO organized and participated in many workshops involving representatives from the local industry. These workshops included; pharmaceuticals, cosmetics, food industries. In addition, ACI organized a workshop with its members were the INVENT project was introduced and the

survey was filled by the attendees. The target number of participants was 70; and the actual number of participants was 126.

In addition, JUST conducted many one-on-one interviews with many industries in Amman and Irbid.

Some photos of related activities are shown in Annex III.

4. KEY RESULTS

4.1 Faculty Members Survey

1. Results indicated that more than 80% of joint projects are initiated by the researcher not by the industry, with 1/3 of collaboration was with one project, and about 80% of the collaborated projects were funded with less than 10,000 JD.
2. The outcomes of the collaborative projects were: journal publications and registered patents.
3. About 50% of the participants were not satisfied with their joint work with industry!!
4. The reasons for the un-satisfying collaboration were shortage of the fund (38%), difficulties in dealing with the industrial partner's management (25%), lack of productive communication (22%) and different priorities (16%).
5. More than 51% of the participants think that universities should take the initiatives to establish partnerships with the industry.
6. Top 5 reasons why researchers get involved in joint projects with the industry are: getting funding (25%), acquiring practical knowledge (22%), having a field to test theories (20%), students internship (18%), and obtaining patentable innovations and business opportunities (16%).
7. While 51% of the participants indicated that they know that their universities have a specialized center for establishing university-industry partnerships, about 25% of the participants do not know about such center.
8. About 84% indicated that they would support their university decision to establish a specialized center as a liaison between faculty members and the industry.
9. Among the factors preventing faculty members from undertaking industrial projects are: high teaching and administrative load (more than 50% agreed); the lack of labs in the industry (more than 50% agreed); the geographical location (about 50% agreed); the absence of clear procedure for the collaboration with the industry (more than 60% agreed); industrial collaboration is not considered a part of the duties (more than 65% agreed); and the lack of confidence to undertake industrial projects (55% agreed).

4.2 Industrial Survey

1. More than 44% of the respondents represented the technical departments with more than 55% hold a BSc. Degree.
2. More than 45% of the participated industry have 50-250 employees, with more than 50% are in the food, chemicals and cosmetics sectors, more than 65% have R&D departments that have budget less than 10,000 JD
3. More than 57% of those who had previous collaboration with universities indicated that the universities started the first contact.
4. Most of the collaboration projects with universities were through students training (49%); and graduation or thesis projects (17%).

5. More than 60% of the collaboration with the universities was through only one project, and with a budget less than 1,000 JD (87%).
6. About half of the participants indicated that their experience with collaboration projects with universities was successful.
7. Among the reasons for unsuccessful collaboration are: difficulty in dealing with university administration (31%); different priorities (31%); and lack of communication (19%).
8. About 70% of the direct impact on the companies from the collaboration with universities was either developing new products or improving current products.
9. More than 60% of the participants indicated that they would like to collaboration again with universities.
10. According to the participants, among the best ways to establish a partnership with universities are: meetings with faculty members (27%); support applied research (14%); and consultations (27%).
11. More than 75% of the participants indicated that they are not aware of the presence of TTOs at the universities.
12. According to the participants, the services needed by the industry from the TTOs are: Awareness of modern technologies (24%); applied research to develop/upgrade products (23%); and connection with other companies (17%).
13. According to the participants, factors to promote innovation and industrial inventions are: Establishment of TT centers (30%); improving communication and building trust (23%); and improvement of mechanisms to promote applied research outcomes at universities.
14. More than 95% of participants indicated that they are interested in communicating with TTO at universities.

Detailed results of both surveys are shown in Annexes IV and V.

5. CONCLUSIONS

While both surveys' results indicated the need for effective collaboration among local industries and higher education institutions in Jordan; each survey results identified different reasons for the week collaboration. However, two common results from both surveys for the lack of collaboration were the lack of communication, and difference in the priorities of each of them. The surveys' results emphasized the need for having an office or a center to act as a liaison between the university and the industry. Effective communication, building the trust among academia and industry, and changing the mentality of the administration in both academia and industry are needed to build effective and productive partnerships. The local industries need to be introduced to the TTO at the HEIs in Jordan in order to be updated on modern technologies, develop applied research and upgrade products, and connect with other companies; these should be incorporated in the training programs that will be developed by the EU partners.

ANNEX I: FACULTY MEMBERS SURVEY

Dear Sir/Madam,

In December 2015, a consortium of fourteen partners from Jordan, Germany, Spain, Cyprus, Italy, Portugal, Greece and United Arab Emirates joined the project entitled **"Promotion of Innovation Culture in the Higher Education in Jordan (INVENT)"**- a three years Cooperation for innovation and the exchange of good practices, co-founded by the European Commission under the Erasmus+ programme.

The project concentrates on strengthening and enhancing the role of higher education institutions and universities in innovation capacity building, technology transfer and commercialization of applied scientific research outcome in Jordan aiming at the creation of the essential environment for innovation in order to build a knowledge-based economy.

The main objectives of the project that will be met through the **establishment of 4 Centres for Transfer of Innovation (CTIs)** in Jordan are:

- the development of economic thinking and interest to use innovation by entrepreneurs and business community,
- the raising of awareness of the innovation importance among the university researchers and the local businesses,
- the provision of chance to the researchers to apply their research results,
- the provision of a clear view of the technological needs of the local industries so that the research and researchers' priorities can be well identified,
- the capacity building of CTIs' staff in order to enhance the sector of innovation and technology transfer.

The INVENT team kindly requests your participation in a survey focused on the identification and analysis of the training needs of future workers in innovation and entrepreneurship promotion centres.

To this end, your answers will be of great help for the establishment of Centres for Transfer of Innovation that will be effective in accomplishing their goal. Most of the questions can be answered by clicking boxes that have the best correspondence with your expectations.

Participation in the survey is voluntary. All responses will be treated with the strictest confidence and no individual will be identifiable in the published report. However, we would be extremely grateful for your valuable implication and input, if you agree to participate.

What will be your benefit?
Participating in the survey promises longer-term benefits as the findings will form the basis for the promotion of innovation culture in the Universities of Jordan so that they become a pillar in the development of a knowledge-based national economy.

If you have further questions please contact Dr. Mohannad Al-Jarrah, Tel:0970613617, email: mtaljarrah@just.edu.jo.

Thank you in advance for your cooperation.

Yours faithfully,

Prof. Fahmi Abu Al-Rub
INVENT Project Coordinator

QUESTIONNAIRE

Part A: General Information

Please provide some information about yourself

1. Your university

1 ☐ Jordan University of Science and Technology
2 ☐ Jordan University
3 ☐ Hashemite university
4 ☐Yarmouk University
5 ☐Jordan German University
6 ☐ Other (please specify) _____

2. Your position in the university *(please tick from both groups if required)*

- Administrative positions:

1☐ vice-rector 2☐ Dean 3☐ vice-Dean 4☐ Head of department 5☐ Other _____

- Academic title:

1☐ Professor 2☐ Associate professor 3☐ Assistant Prof 4☐ Lucturer

3. Your qualifications/degree 1☐ PhD. 2☐ Other _____

4. Gender 1☐ M 2☐ F

5. Age 1☐ under 25 2☐ 25-29 3☐ 30-39 4☐ 40-49 5☐ 50-59 6☐ 60+

6. Your research interests

1 ☐ Information technology
2 ☐ Biotechnology and pharmaceuticals
3 ☐ Computing and electronics
4 ☐ Nanotechnology
5 ☐ Chemicals and chemical technology
6 ☐ Renewable energy (solar, wind, etc)
7 ☐ Environmental technology (water treatment, air pollution, etc)
8 ☐ Other (please specify) _____

7. Number of publications related to your research interests in the last 5 years

1 ☐ 0-5 2 ☐ 6-10

3 ☐ 11-15 4 ☐ 16-20

5 ☐ 21-25 6 ☐ more than 25

Part B: Partnership with Industry (Personal Experience)

If you haven't done any projects in collaboration with industry, please skip this part

8. Who initiated the first contact between you and your industrial partner?

1 ☐ You 2 ☐ Your industrial partner 3 ☐ Other (please specify) _____

9. Number of projects (past or current) performed with partnership with a private industrial sector

1☐ 1 2☐ 2 3☐ 3 4☐ 4 5☐ 5 6☐ 6 7☐ 6 8☐ more than 7

10. From the private industrial companies which you cooperated with, how many employees did the company have?:

1☐ 0-9 2☐ 10-49 3☐ 50-249 4☐ more than 250

11. Number of projects (past or current) performed with partnership with a public industrial sector

1☐ 1 2☐ 2 3☐ 3 4☐ 4 5☐ 5 6☐ 6 7☐ 6 8☐ more than 7

12. Number of publications resulted from your partnership with the industry

1 ☐ 0-5 2 ☐ 6-10

3 ☐ 11-15 4 ☐ 16-20

5 ☐ 21-25 6 ☐ more than 25

13. Please indicate who is financing the project(s) *(please tick multiple if applicable)*

1☐Self-financed projects 2☐ Regionally funded projects 3☐Nationally funded projects

4☐EU funded 5☐ Other (please specify)_____

14. Amount of fund received from industry, national public sources and EU public sources.

		Less than 1000	1000-5000	5000-10000	10000-20000	> 20000	No fund received
1	industry (average fund/project)	1	2	3	4	5	6
2	national public sources (average fund/project)	1	2	3	4	5	6
3	EU public sources (average fund/project)	1	2	3	4	5	6

15. Did you receive financial compensation for your time that you spent on this research?

1☐ Yes 2☐ No

16. Did any of your joint projects with industrial partner resulted in a registered patent?

1☐ Yes 2☐ No

If yes, who owns the patent? *(please tick multiple if applicable)*

1 ☐ industry owned 2 ☐ university owned 3 ☐ joint ownership

4 ☐ Other (please specify) _____

17. Are you satisfied with your partnership with the industry?

1☐ Yes 2☐ No

If "No", what was the major source of your dissatisfaction? *(please tick multiple if applicable)*

1 ☐ Shortage of fund
2 ☐ Lack of productive communications
3 ☐ Conflict over IP rights
4 ☐ Difficulty in dealing with industry management
5 ☐ Misaligned priorities
6 ☐ Other (please specify) _____

18. In your opinion, did your partnership with industry impact your teaching methods at the university? (i.e. curricula improvements)

1☐ Yes 2☐ No

19. Did you have students involved (graduate/undergraduate) during your partnership with industry?

1☐ Yes 2☐ No

20. Please state your opinion whether the students involved in research partnership with the industry are more likely to develop the following skills *[rate on a scale of 1-5, where 1=Totally disagree, 3=Neither agree nor disagree, 5= Strongly agree]*

	Skills					
1	New oral/verbal communications skills	1	2	3	4	5
2	New critical thinking/problem solving skills	1	2	3	4	5
3	New judgement/decision making communications skills	1	2	3	4	5
4	New teamwork skills	1	2	3	4	5
5	Time management skills	1	2	3	4	5
6	Innovation/creativity thinking	1	2	3	4	5

21. Has the research problem that you tackled been solved?

1☐ Yes 2☐ No

22. Based on your personal experience, are you willing to partner with industry again/ recommend partnership to a friend?

1☐ Yes 2☐ No

Part C: Partnership with Industry (General perspective)

Please answer the following questions based on your general perception of the subject

23. In your opinion, who should be responsible for establishing new partnerships between universities and industry?

1 ☐ The university

2 ☐ The industry

3 ☐ The government

4 ☐ The RTO (Research Technical Organizations)

5 ☐ Other (please specify) _____

24. From your point of view, please rate the following as benefits for industry-university partnership *[rate on a scale of 1-5, where 1=least important, 5= most important]*

	Benefits					
1	Additional revenue for the university	1	2	3	4	5
2	Positive effect on curriculum	1	2	3	4	5
3	Two way knowledge transfer	1	2	3	4	5
4	Local/regional economic development	1	2	3	4	5
5	More rapid technological diffusion	1	2	3	4	5

25. From your point of view, please rate the following as drawbacks for industry-university partnership *[rate on a scale of 1-5, where 1=is least important and 5=most important]*

	Benefits					
1	Negative impact on culture of open science	1	2	3	4	5
2	Negative impact on student/advisor relationship	1	2	3	4	5
3	Negative impact on curriculum	1	2	3	4	5
4	Reduce the quantity and quality of basic research	1	2	3	4	5
5	Academics could spend less time on teaching and serving	1	2	3	4	5

26. In your opinion, why would a faculty member start a partnership with an industrial partner? *(please tick multiple if applicable)*

1 ☐ To get funding for research assistants and new lab equipment

2 ☐ To have a field to test new theories and empirical equations

3 ☐ Acquiring practical knowledge useful for teaching

4 ☐ Student internships and job placement

5 ☐ Obtaining patentable inventions and business opportunities

6 ☐ Other (please specify) _____

27. In your opinion, would you consider the IP rights over new research results to be a critical issue in university-industry partnership?

1☐ Yes 2☐ No

28. Does your university have a specialized center for establishing university-industry partnerships?

1☐ Yes 2☐ No

29. Would you support your university decision to establish a specialized center as a liaison between faculty members and industry?

1☐ Yes 2☐ No

30. In your opinion, what are the best ways to establish a partnership with the industry? *(please tick multiple if required)*

1 ☐ Travel to company site and give presentations to industry personnel

2 ☐ Give workshops at the industrial site, and inform the industrial personnel of new research methods

3 ☐ Going to conferences and publishing in journals 4 ☐ Being a member of a specialized center

5 ☐ Other (please specify) _____

31. Please state your opinion for the following statements *[rate on a scale of 1-5, where 1=Totally disagree, 3=Neither agree nor disagree, 5= Strongly agree]*

	Statements					
1	Teaching and other administrative load prevents faculty from undertaking industrial projects	1	2	3	4	5
2	Academic researcher do not consider industrial collaboration as part of their job	1	2	3	4	5
3	Your university does not have enough laboratory facilities to support academic-industry partnerships	1	2	3	4	5
4	The University's geographic location is an obstacle in academic industry partnership	1	2	3	4	5
5	The University has clear procedures and processes in place to support Academia-Industry collaboration	1	2	3	4	5
6	Academics feel confident to undertake industrial projects	1	2	3	4	5

32. Does your university involve staff from industry in teaching programs?

1☐ Yes 2☐ No

33. Does your university made it obligatory for Faculty to undertake a certain amount of work with industry as part of their job?

1☐ Yes 2☐ No

34. Does your university acknowledge the faculty members who get projects from the industry?

1☐ Yes 2☐ No

Part D: End of the questionnaire

Please state other comments/ observations/ proposals

Thank you for your time and support in completing this questionnaire.

If you would like to receive a brief report of the survey results, please let us know your e-mail address:

_____

ANNEX II: INDSUSTRY SURVEY

عزيزي المشارك

بعد التحية:

يهديكم الفريق الأردني على مشروع البحث: " تعزيز ثقافة الابتكار في التعليم العالي في الأردن" والمدعوم من الإتحاد الاوروبي ضمن برنامج ايرازموس +، أجمل التحيات ويسره التواصل معكم لتحديد احتاجاتكم من الجامعات الأردنية وذلك لبلورة مقترح لزيادة التعاون بين القطاع الصناعي و الجامعات الأردنية.

تركز هذه الدراسة على تحديد وتحليل الاحتياجات التدريبية للعاملين في القطاع الصناعي في مراكز الابتكار وتعزيز روح المبادرة لديهم.

وتتمثل الأهداف الرئيسية للمشروع التي سيتم تلبيتها من خلال إنشاء 4 مراكز لنقل الابتكار في الأردن بما يلي:

- تطوير الفكر الاقتصادي والاهتمام باستخدام الابتكار في قطاع الصناعه
- رفع الوعي بأهمية الابتكار بين الباحثين في الجامعات والشركات الصناعية المحلية
- توفير فرصة للباحثين لتطبيق نتائج أبحاثهم في الصناعات المحلية
- توفير رؤية واضحة للاحتياجات التكنولوجية للصناعات المحلية

ولهذه الغاية، سوف تساهم إجاباتك في إنشاء مراكز لنقل الابتكار التي من شأنها أن تكون فعالة في تحقيق هدفها وتحقيق ما تصبو إليه االصناعات الأردنية.

يرجى العلم بأن المشاركة في هذه الدراسة من خلال تعبة هذا الإستبيان هي تطوعية وسيتم التعامل مع جميع الردود بسرية تامة.

شاكرين لكم دعمكم لإنجاح هذا المشروع الوطني.

مع تحيات فريق الباجثين الأردنيين، عنهم الأستاذ الدكتور فهمي أبو الرب مدير المشروع.

الجزء الأول: معلومات عامة

1. ما هو موقعك الوظيفي في الشركة/ المصنع؟

□ مدير (مدير عام، مدير دائرة، ..) □ تقني (مهندس انتاج، فني مختبر،...) □ بحث و تطوير
□ غير ذلك: _____

2. ما هي مؤهلاتك الاكاديمية؟

□ دبلوم □ بكالوريوس □ ماجستير □ دكتوراة □ غير ذلك: _____

3. عدد موظفين الشركة:

□ 1-9 □ 10-49 □ 50-249 □ أكثر من 250

4. ما هو القطاع الصناعي الفرعي الذي تعملون به؟

□ الصناعات العلاجية واللوازم الطبية
□ الصناعات الكيماوية ومستحضرات التجميل
□ الصناعات الإنشائية
□ الصناعات الجلدية والمحكيات
□ الصناعات التعدينية
□ الصناعات الهندسية والكهربائية وتكنولوجيا المعلومات
□ الصناعات الخشبية والاثاث
□ صناعة التعبئة والتغليف والورق والكرتون واللوازم المكتبية
□ الصناعات البلاستيكية والمطاطية
□ الصناعات التموينية والغذائية والزراعية والثروة الحيوانية

5. هل لدى شركتكم قسم مختص بالبحث والتطوير؟

□ نعم □ لا

6. ما هو متوسط الانفاق السنوي لشركتكم على البحث والتطوير (دينار اردني)؟

□ 0-999 □ 1,000-9,999 □ 10,000-49,999 □ أكثر من 50,000 □ لا أعلم

الجزء الثاني: الخبرة السابقة في مجال التعاون مع الجامعات الاردنية

يرجى عدم الإجابة على هذا الجزء في حال عدم وجود خبرات سابقة في مجال التعاون مع الجامعات

7. من الذي بادر بالاتصال بين شركتكم و بين الجامعات؟

□ شركتكم □ طرف من الجامعة □ غير ذلك: _____

8. ماذا كانت مجالات التعاون بين شركتكم و الجامعات: (يمكنك اختيار اكثر من خيار)

□ تدريب طلاب □ مشاريع تخرج أو دراسات عليا □ برنامج دكتور لكل مصنع
□ استشارة من أستاذ جامعي □ استثمار في مخرجات البحث العلمي التطبيقي □ غير ذلك: _____

9. عدد المشاريع السابقة و الحالية مع الجامعات؟

□ 1 □ 2 □ 3 □ 4 □ 5 □ أكثر من 5

10. ما هو متوسط انفاقكم للمشروع (دينار أردني)؟

□ 999-0 □ 4,999-1,000 □ 9,999-5,000□ 49,999-10,000□ أكثر من 50,000

11. برأيك هل الأموال التي انفقت على التعاون مع الجامعات أفادت شركتكم؟ (أمثلة: تطوير منتجات جديدة، حل مشاكل تقنية،...)

□ نعم □ لا □ لم يتم انفاق أي مبالغ

12. كيف تقيم تجربتكم مع الجامعات؟

□ ناجحة □ غير ناجحة □ محايدة

13. اذا كانت تجربتك غير ناجحة في التعاون مع الجامعات، فما هو سبب عدم نجاحها: (يمكنك اختيار اكثر من خيار)

□ نقص في التمويل □ نقص في التواصل الفعال □ صعوبة في التعامل مع إدارة الجامعة
□ أولويات مختلفة □ نقص المعرفة للطلاب من الجامعة □ نقص المعرفة و الخبرة للأستاذ الجامعي
□ عدم حل المشكلة او انجاز المهمة المطلوبة □ غير ذلك: _____

14. اذا كانت تجربتكم ناجحة في التعاون مع الجامعات، فما هو الأثر المباشر على شركتكم: (يمكنك اختيار اكثر من خيار)

□ تطوير منتج جديد □ تطوير منتج حالي □ تطوير خط انتاج □ تكنولوجيا جديدة
□ تخفيض كلف الإنتاج □ حل مشكلة فنية □ غير ذلك: _____

15. بناءً على خبراتكم السابقة هل تخطط لتعاون اخر مع الجامعات ؟

□ نعم □ لا

الجزء الثالث: تطلعاتكم و احتياجاتكم حول التعاون مع الجامعات الاردنية

الرجاء الإجابة على الأسئلة التالية على أساس التصور العام لهذا الموضوع

16. ما هي أفضل الطرق للتعاون مع الجامعات؟ (يمكنك اختيار اكثر من خيار)

□ عقد اجتماعات مباشرة مع أساتذة الجامعات لطرح الاحتياجات و التحديات
□ المشاركة في ورش العمل او المؤتمرات التي تنظمها الجامعات
□ الاستثمار في الأبحاث العلمية التطبيقية
□ الاستشارات
□ تدريب طلاب أو مشاريع تخرج
□ المشاركة في عضوية لجان مشتركة مع الجامعات
□ غير ذلك: _____

17. هل تعلم بوجود مراكز متخصصة في مجال الابداع/ نقل التكنولوجيا في الجامعات؟

□ نعم □ لا

18. ما هي الخدمات التي تحتاجونها من مراكز الابداع/ نقل التكنولوجيا: (يمكنك اختيار اكثر من خيار)

□ نشر الوعي و التعريف بالتكنولوجيا الصناعية الحديثة
□ بحوث علمية لتطوير المنتجات (الجديدة و الحالية)
□ تدريب (حدد المجالات):_____
□ ربط مع جهات ممولة
□ استشارات (حدد المجالات):_____
□ ربط مع شركات اخرى
□ غير ذلك:_____

19. ما هي اهم العوامل التي تساعد في تحفيز الابداع و الابتكار الصناعي؟ (يمكنك اختيار اكثر من خيار)

□ وجود مراكز مختصة في تطوير الابداع و نقل التكنولوجيا بين الجامعات و المصانع
□ تطوير آليات التواصل و بناء الثقة بين الجامعات و المصانع
□ تسهيل آليات و شروط تقديم الدعم المالي و القروض من قبل الجهات المانحة و الداعمة للمصانع
□ توفير الحوافز المالية و المعنوية الكافية للكفاءات العلمية المتواجدة في الأردن تجنبا لهجرتها للخارج
□ تخصيص ميزانيات كافية للبحث و التطوير في الشركات الصناعية
□ تطوير آليات ترويج نتائج البحوث العلمية التطبيقية من قبل الجامعات لقطاع الاعمال
□ غير ذلك:_____

20. هل انت مهتم في التواصل مع مراكز الابداع/ نقل التكنولوجيا و الاستفادة من خدماتها لاحقاً؟

□ نعم □ لا

اذا كنت ترغب في التواصل مع مراكز الابداع/ نقل التكنولوجيا يرجى تعبئة المعلومات التالية:

اسم الشركة:_____ الشخص المسؤول (للمتابعة):_____

البريد الالكتروني:_____ خلوي:_____

هاتف:_____ فاكس:_____

يرجى كتابة أي ملاحظات أو مقترحات لديكم ذات علاقة بموضوع الاستبيان

ANNEX III: PHOTOS FROM DIFFERENT INVENT WORKSHOPS

Workshop with Cosmetics Industry

Dead Sea, April 6-7, 2016

Workshop with Food Industry

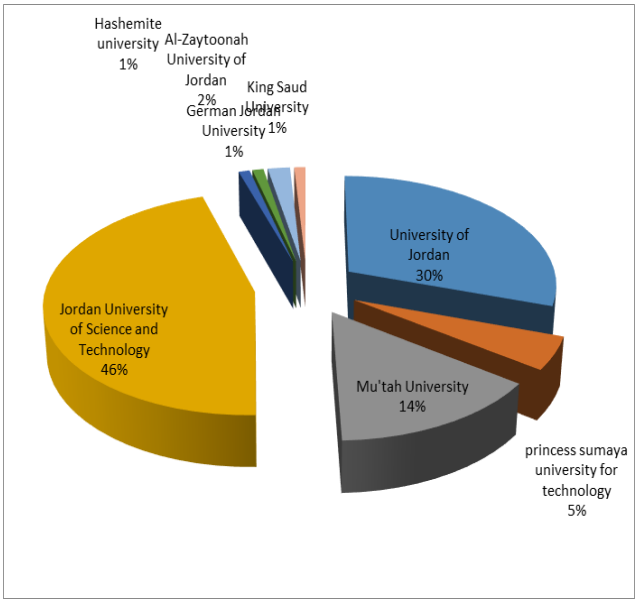
Amman Crown Plaza, April 12-13, 2016


Workshop with Local Industries

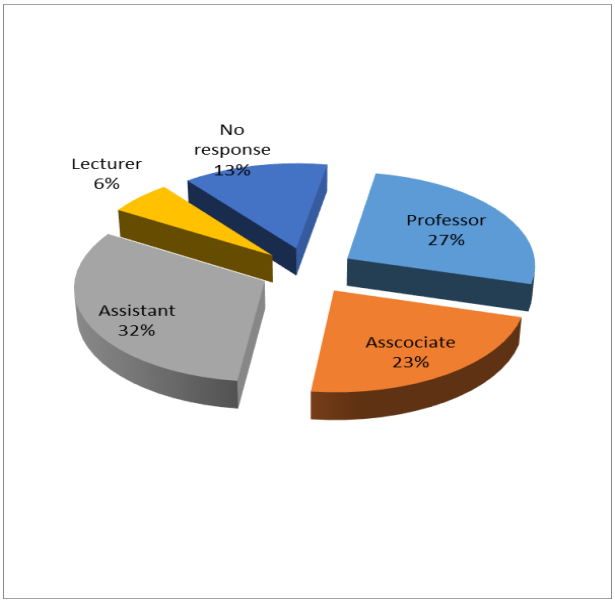
ACI, April 13, 2016

ANNEX IV: RESULTS OF THE FACULTY MEMBERS (ACADEMIA) SURVEY

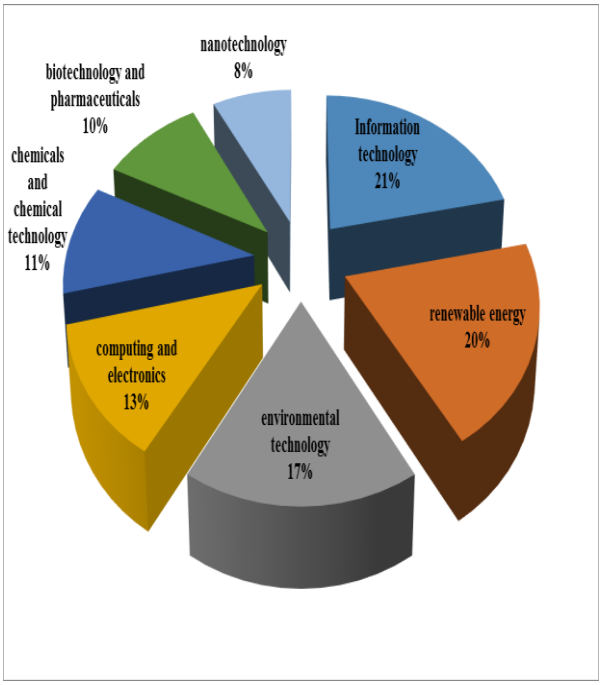
Participating Universities



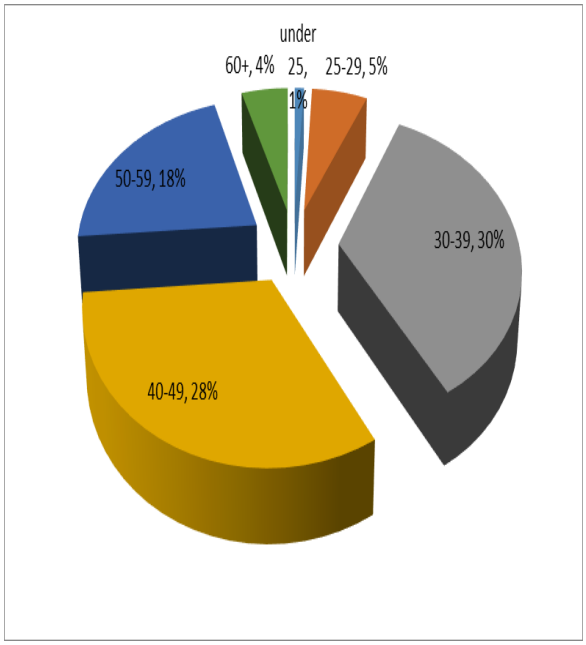
Participants academic ranks



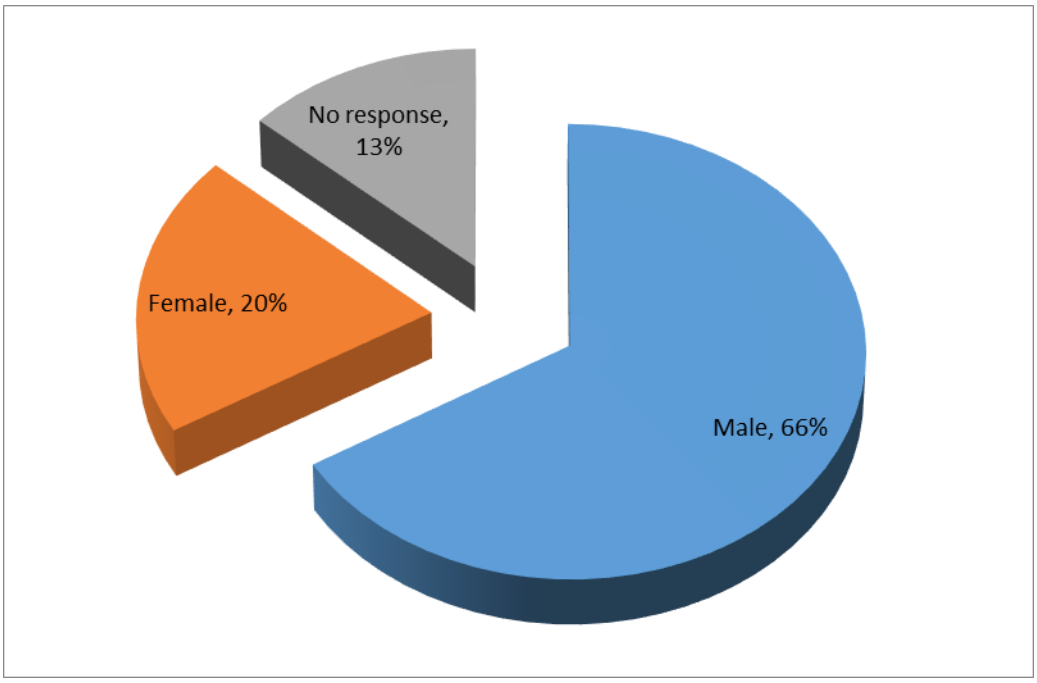
Research Interests of participants

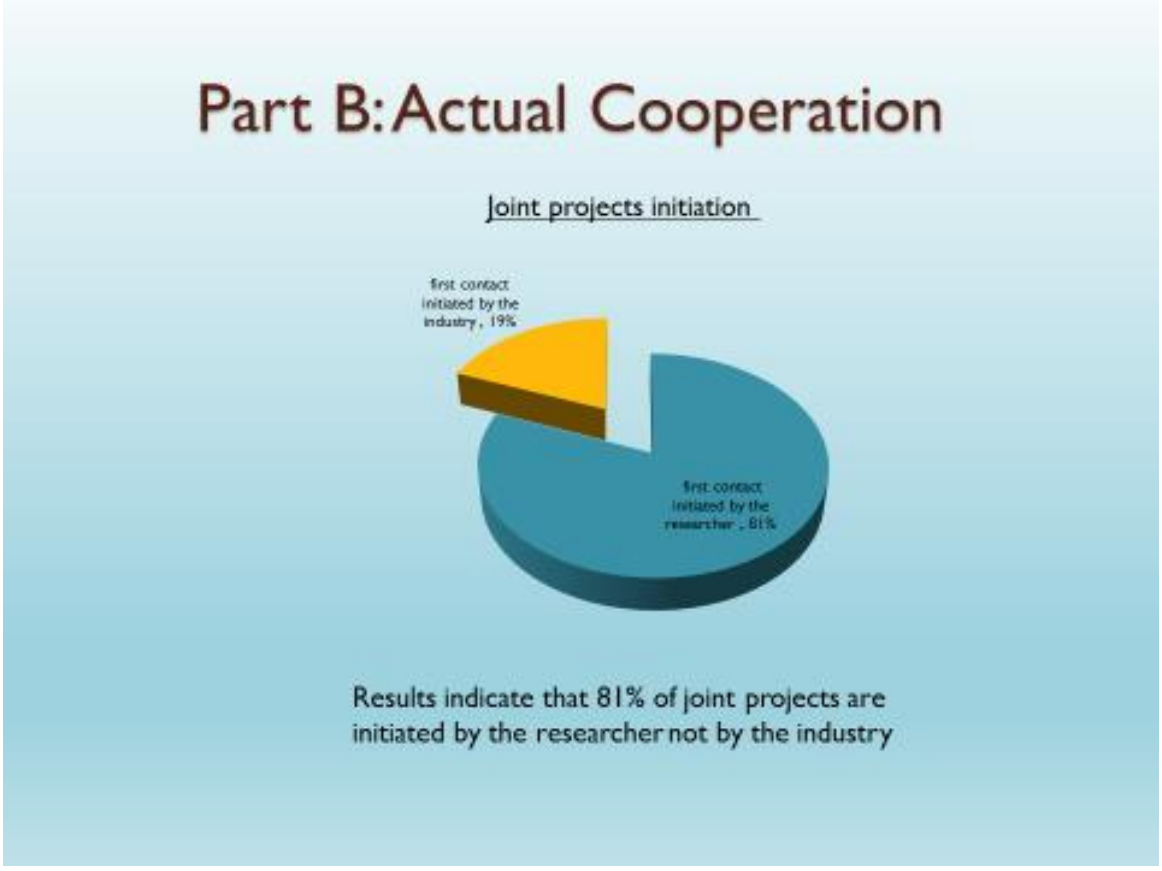


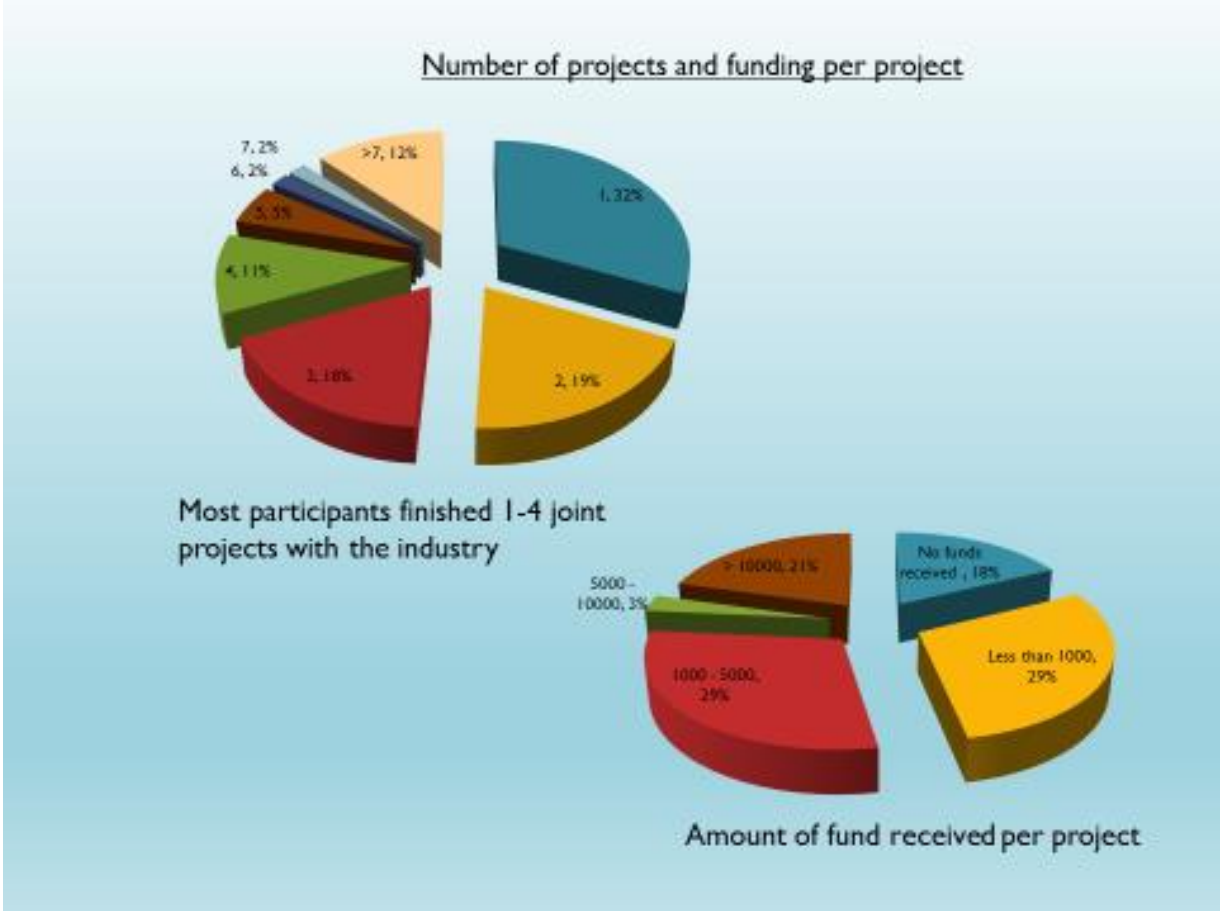
Age group

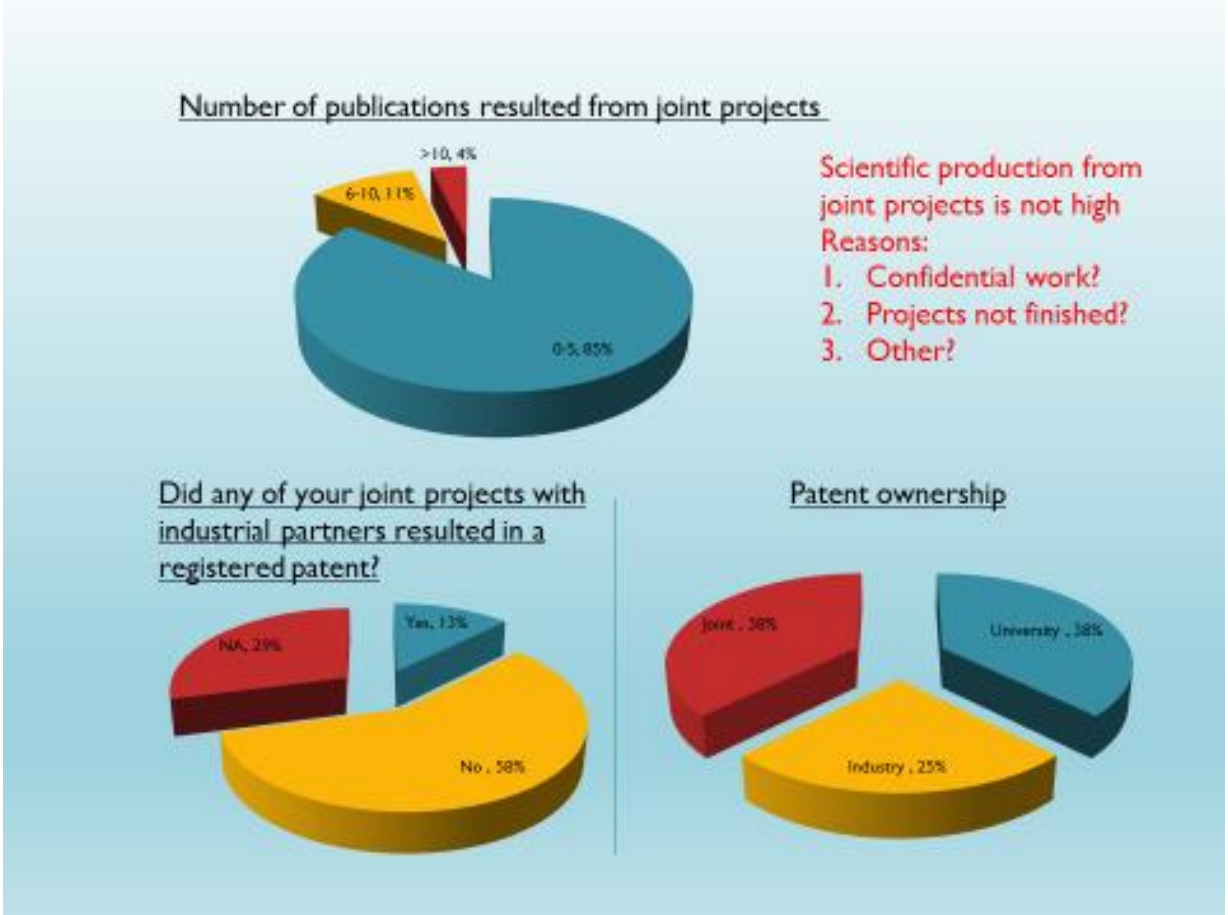


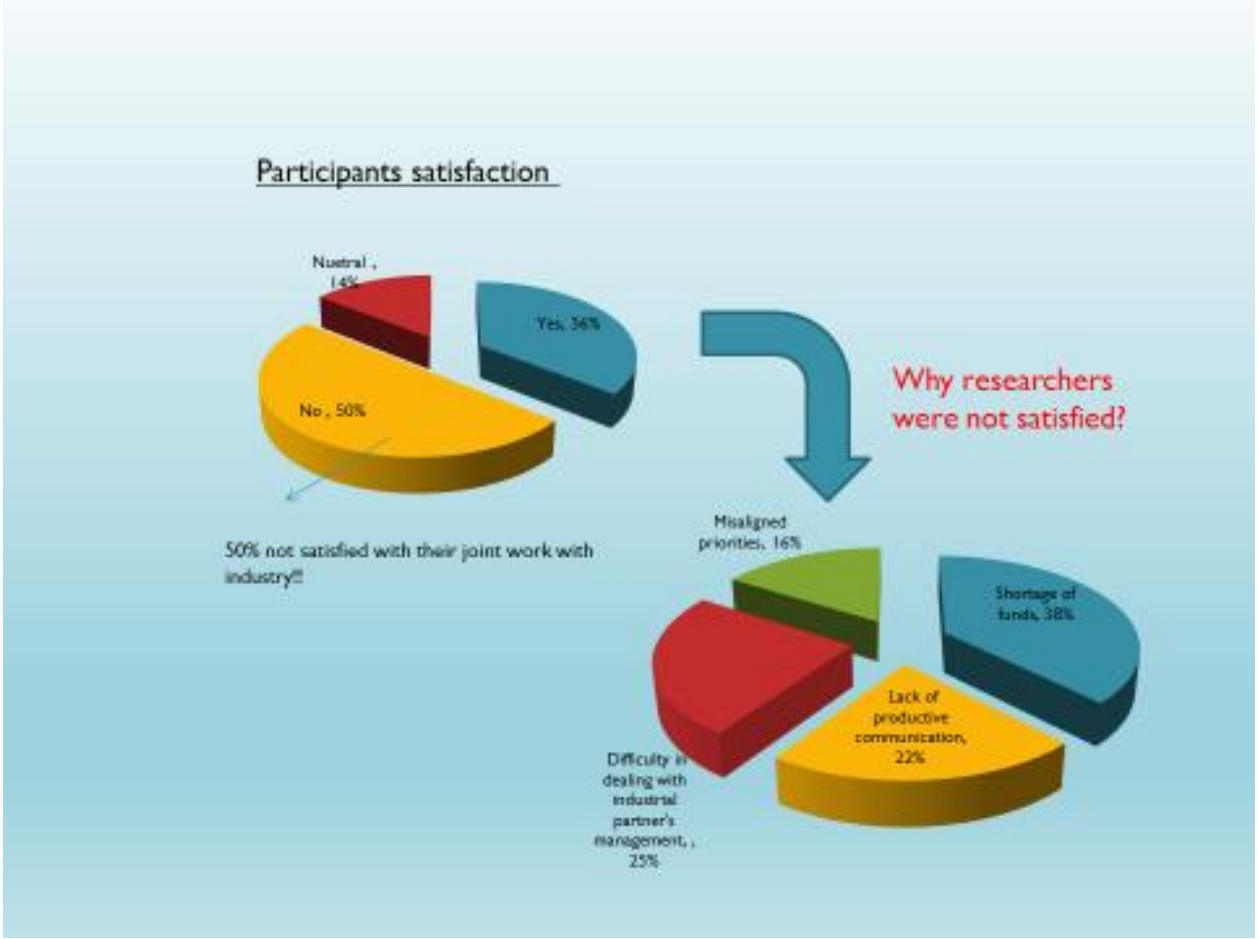
Gender

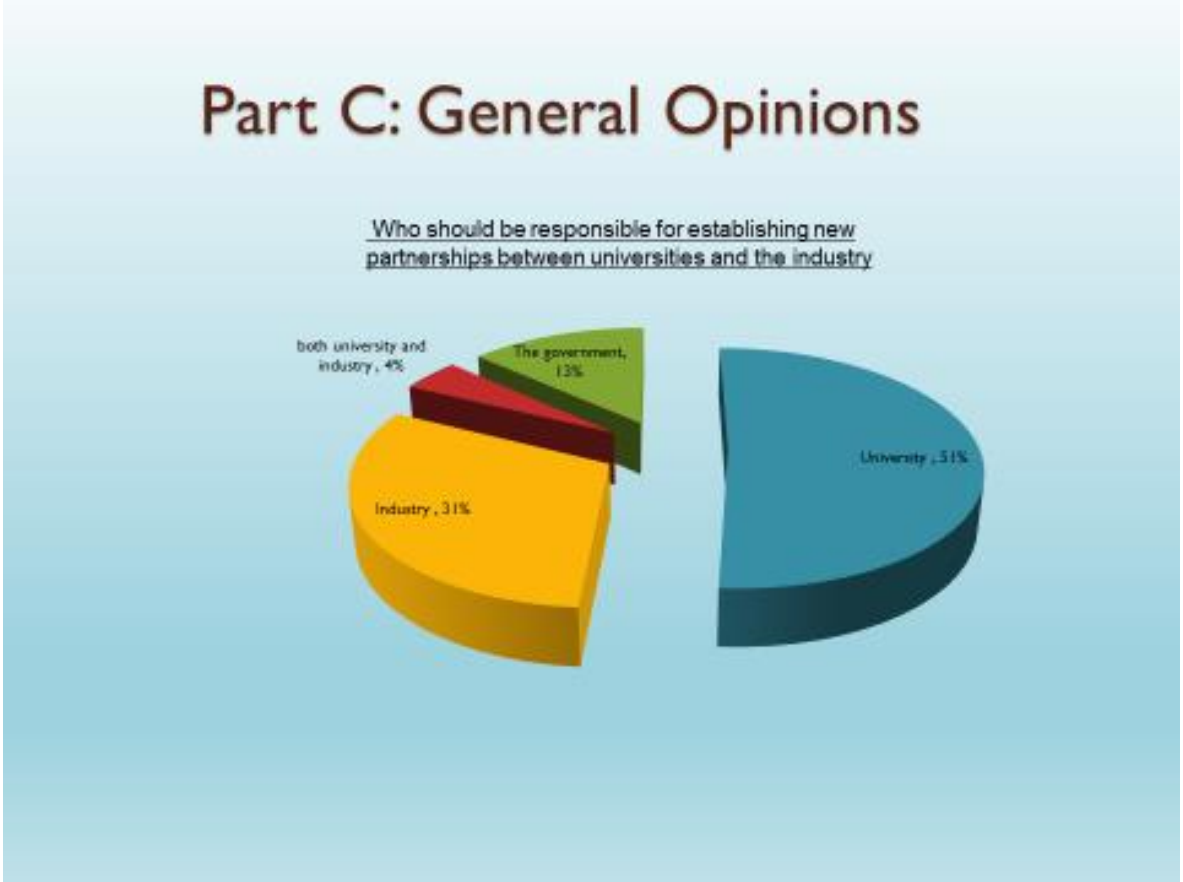


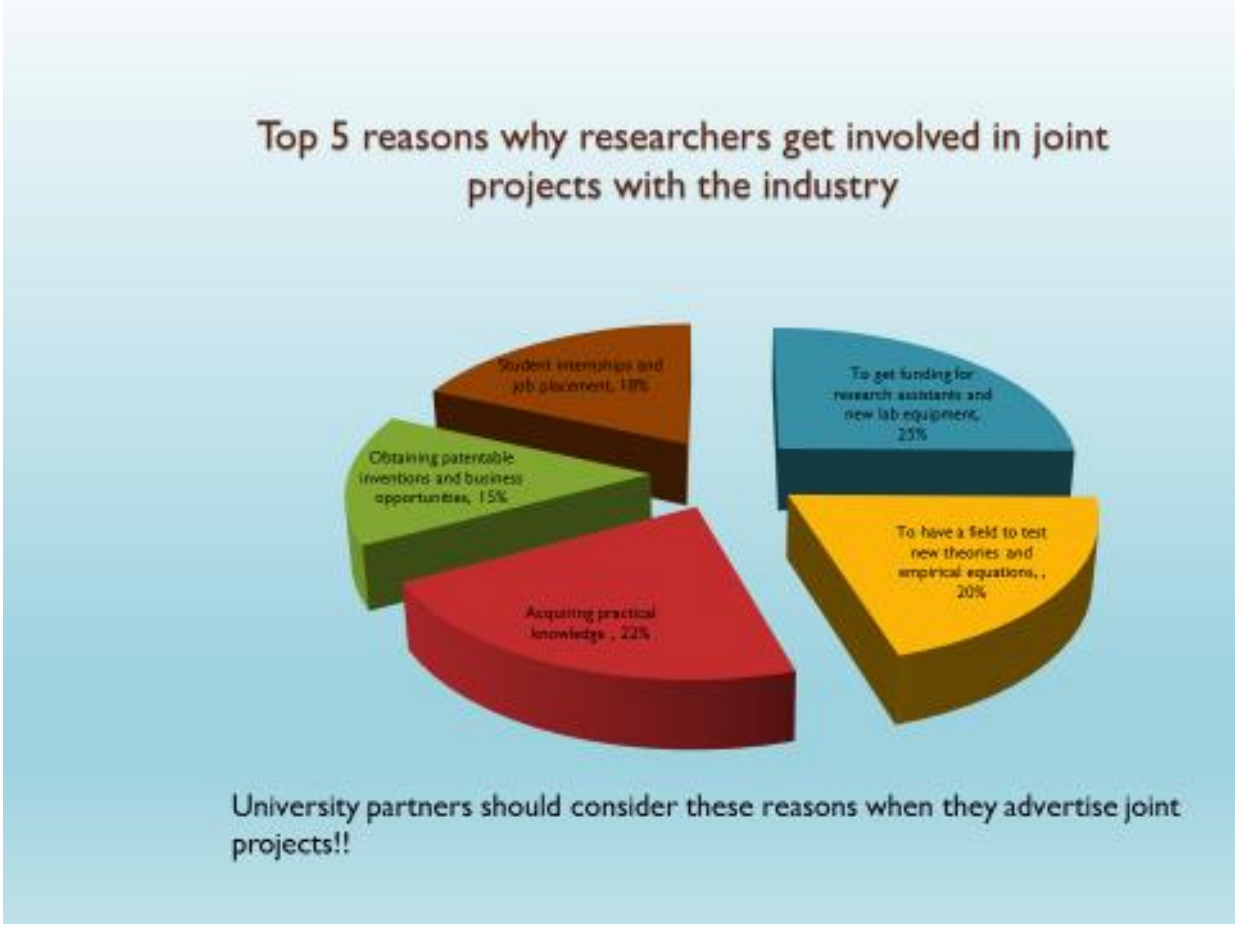

Part B: Actual Cooperation
Joint projects initiation
first contact initiated by the industry , 19%
first contact initiated by the researcher , 81%
Results indicate that 81% of joint projects are initiated by the researcher not by the industry

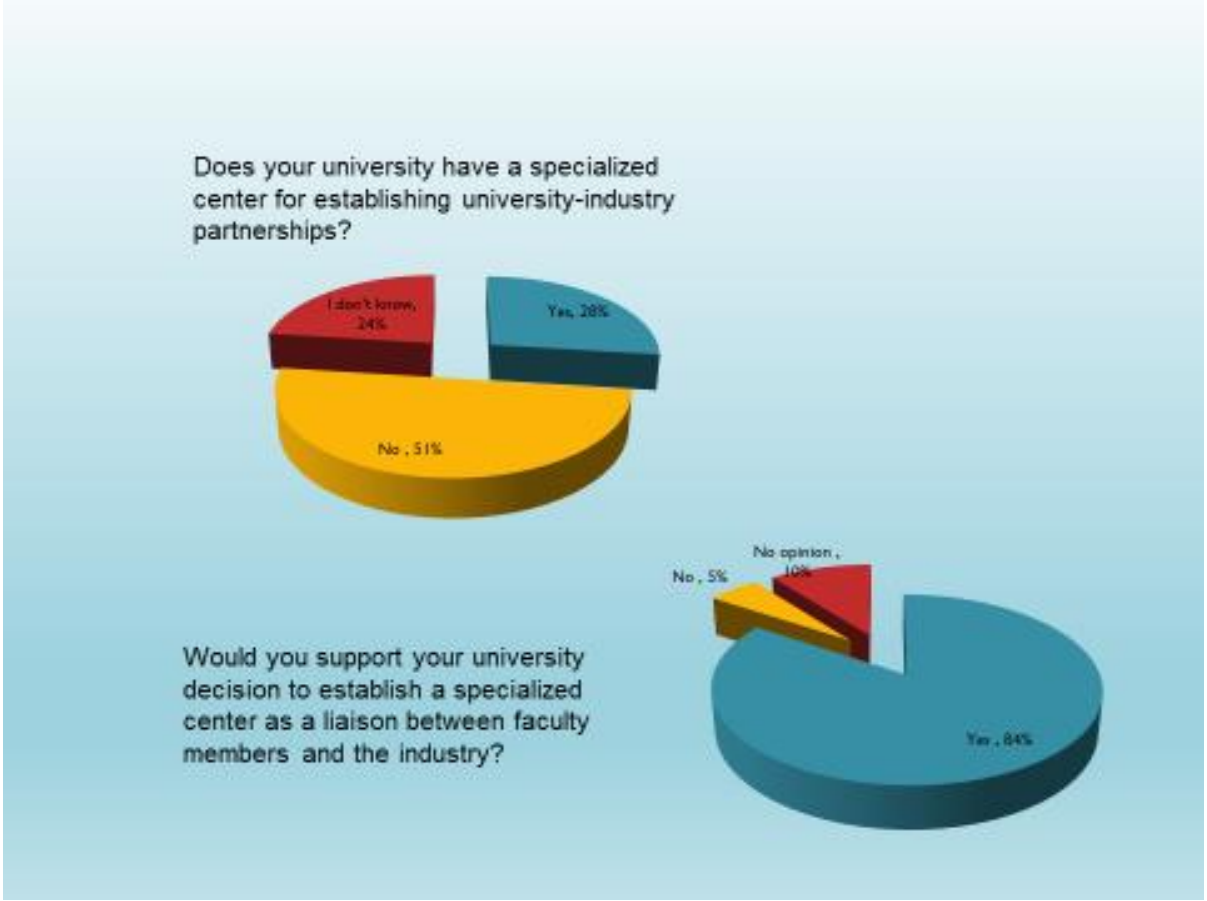

Number of projects and funding per project
7, 2%
6, 2%
>7, 12%
1, 32%
5, 5%
4, 11%
3, 18%
2, 19%
Most participants finished 1-4 joint projects with the industry
> 10000, 21%
No funds received , 18%
5000 - 10000, 3%
1000 - 5000, 29%
Less than 1000, 29%
Amount of fund received per project

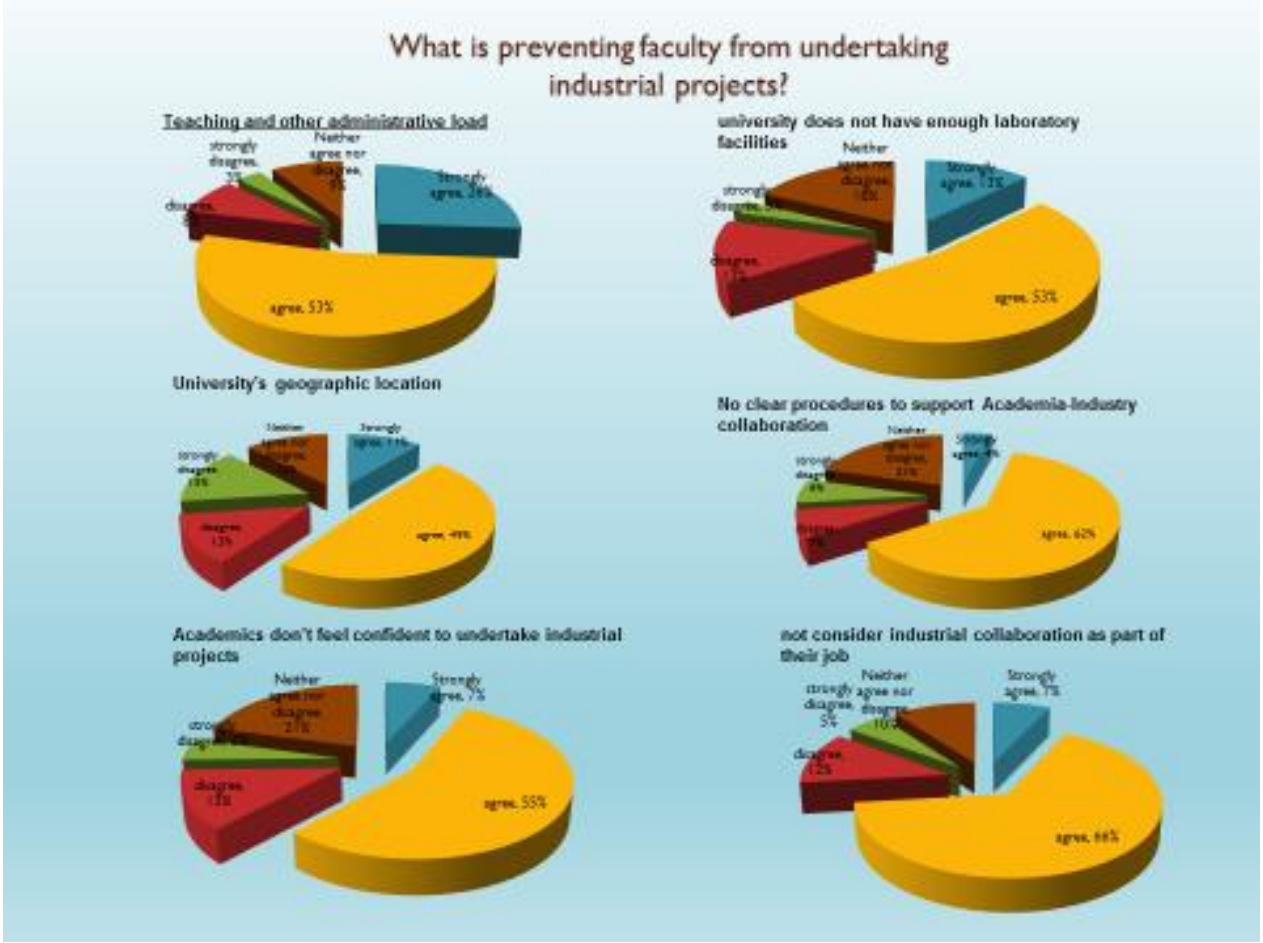

Number of publications resulted from joint projects
>10, 4%
6-10, 11%
0-5, 85%
Scientific production from joint projects is not high
Reasons:
1. Confidential work?
2. Projects not finished?
3. Other?
Did any of your joint projects with industrial partners resulted in a registered patent?
NA, 29%
Yes, 13%
No, 58%
Patent ownership
Joint, 38%
University, 38%
Industry, 25%

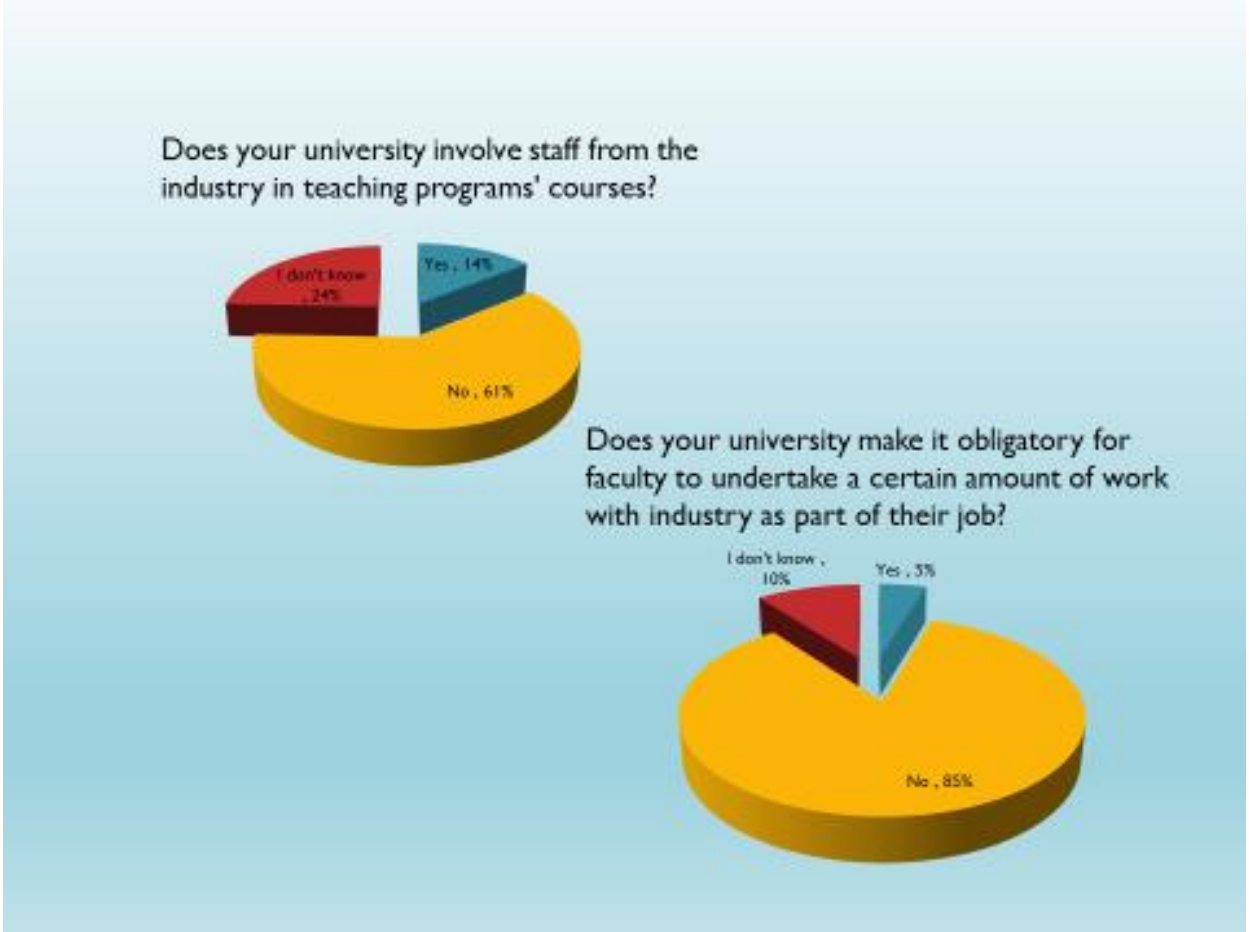

Participants satisfaction
Nuetral , 14%
Yes, 36%
No , 50%
50% not satisfied with their joint work with industry!!
Why researchers were not satisfied?
Misaligned priorities, 16%
Shortage of funds, 38%
Lack of productive communication, 22%
Difficulty in dealing with industrial partner's management, , 25%


Part C: General Opinions
Who should be responsible for establishing new partnerships between universities and the industry
both university and industry , 4%
The government, 13%
University , 51%
Industry , 31%

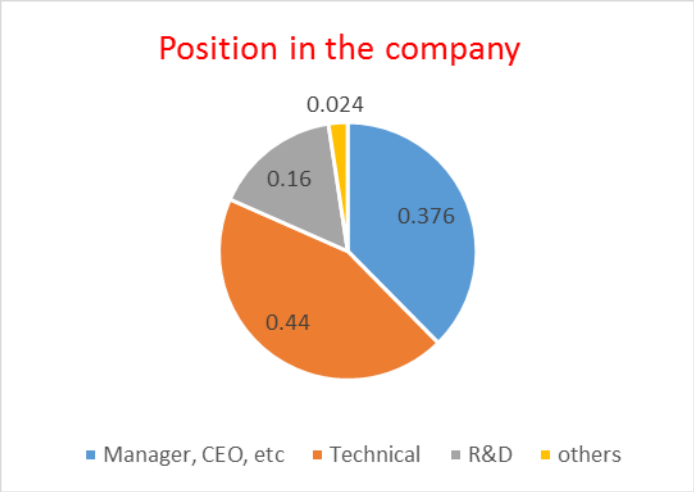

Top 5 reasons why researchers get involved in joint projects with the industry
Student internships and job placement, 18%
To get funding for research assistants and new lab equipment, 25%
Obtaining patentable inventions and business opportunities, 15%
To have a field to test new theories and empirical equations, , 20%
Acquiring practical knowledge , 22%
University partners should consider these reasons when they advertise joint projects!!

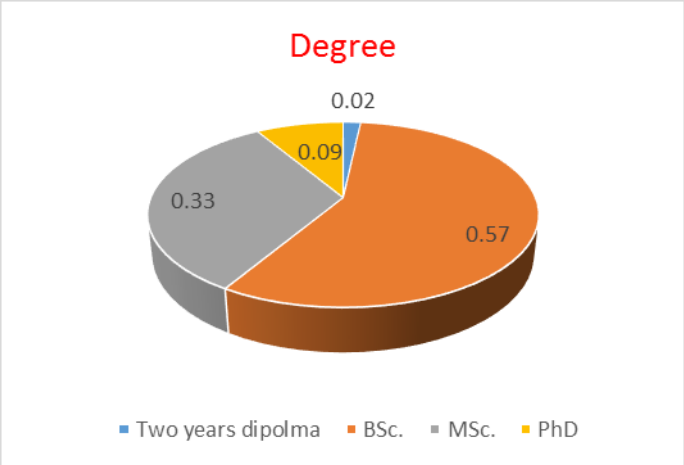

Does your university have a specialized center for establishing university-industry partnerships?
I don't know, 24%
Yes, 28%
No , 51%
Would you support your university decision to establish a specialized center as a liaison between faculty members and the industry?
No opinion , 10%
No , 5%
Yes , 84%

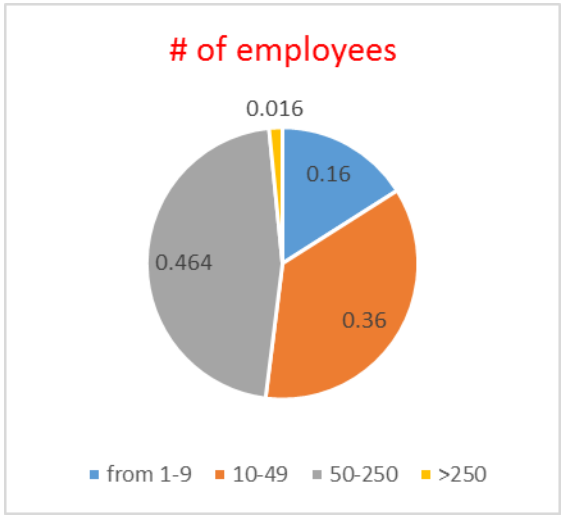

What is preventing faculty from undertaking industrial projects?
Teaching and other administrative load
university does not have enough laboratory facilities
University's geographic location
No clear procedures to support Academia-Industry collaboration
Academics don't feel confident to undertake industrial projects
not consider industrial collaboration as part of their job

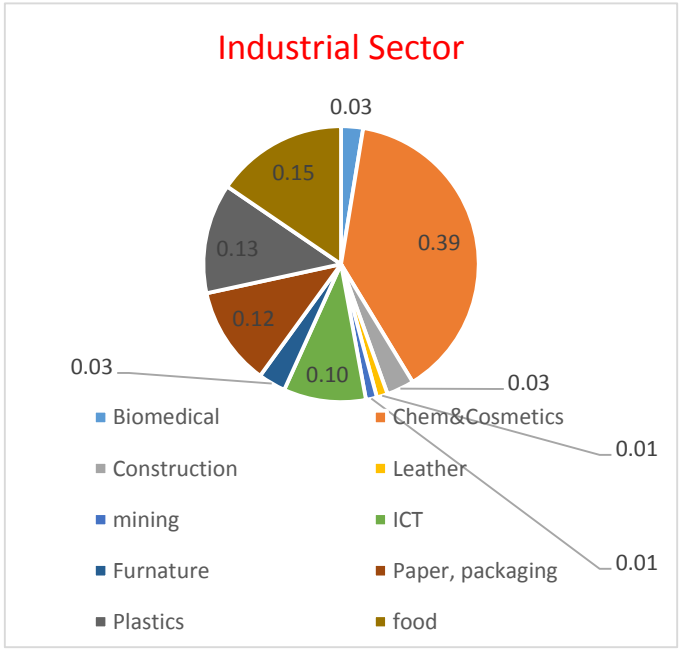

Does your university involve staff from the industry in teaching programs' courses?
I don't know , 24%
Yes , 14%
No , 61%
Does your university make it obligatory for faculty to undertake a certain amount of work with industry as part of their job?
I don't know , 10%
Yes , 5%
No , 85%

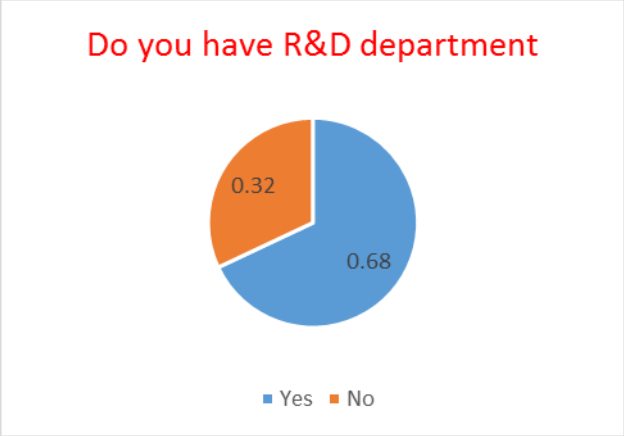
ANNEX V: RESULTS OF THE INDUSTRY SURVEY

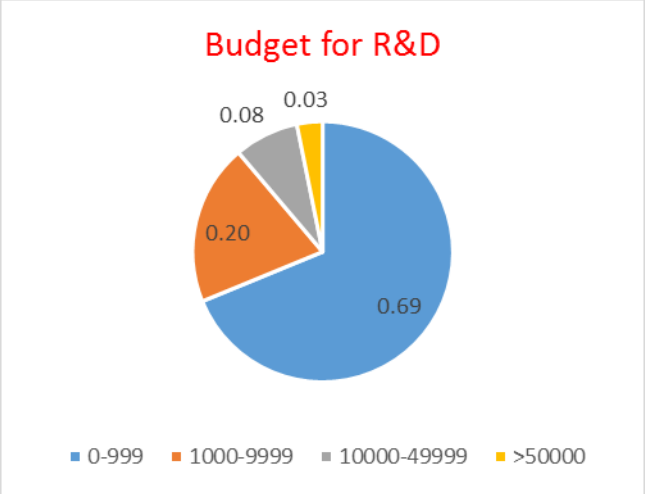


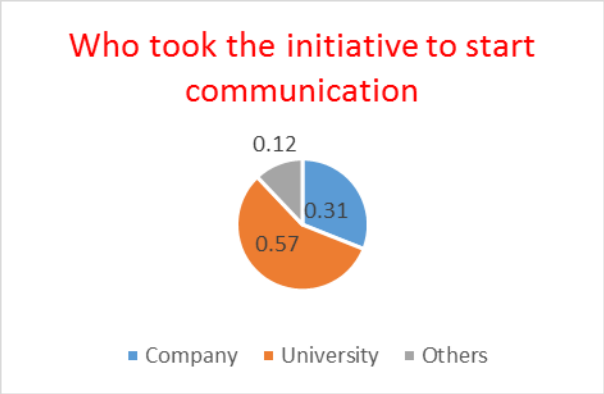


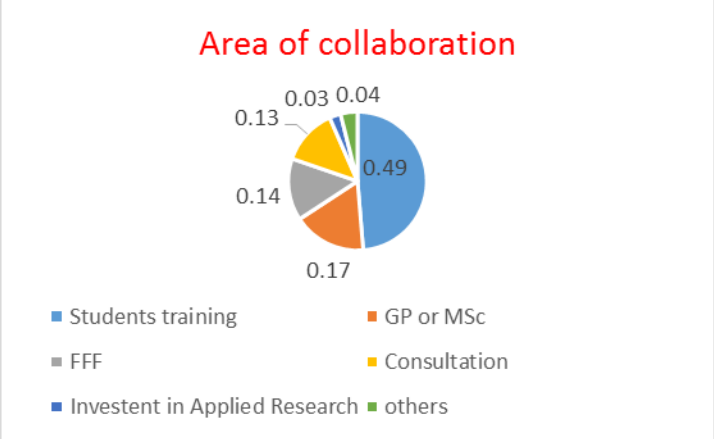

# of employees
0.016
0.16
0.464
0.36
from 1-9
10-49
50-250
>250

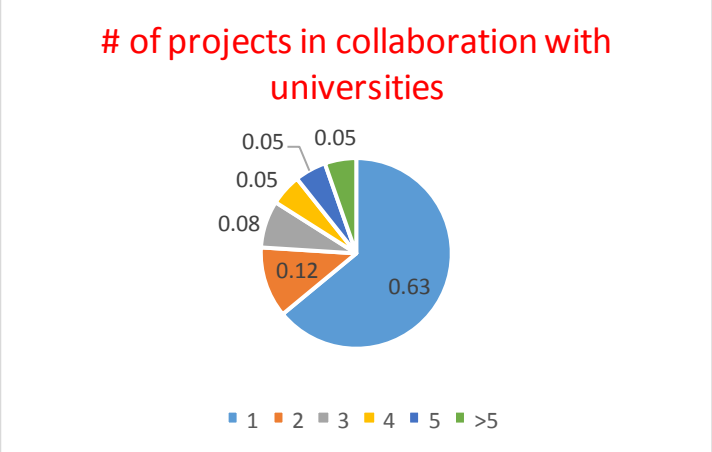

Industrial Sector
0.03
0.15
0.39
0.13
0.12
0.03
0.10
0.03
0.01
0.01
Biomedical
Chem&Cosmetics
Construction
Leather
mining
ICT
Furnature
Paper, packaging
Plastics
food

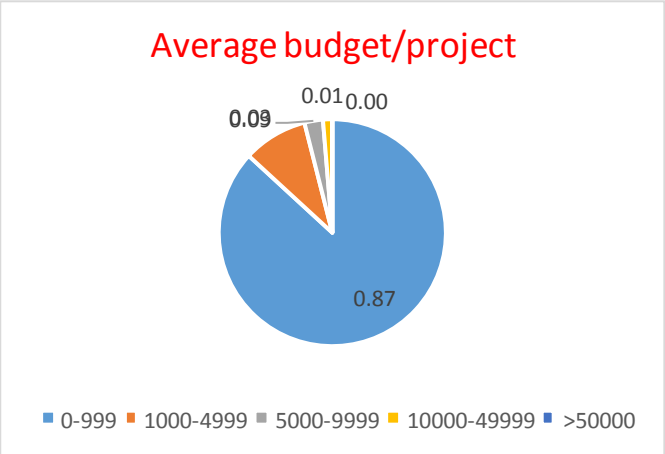

Do you have R&D department
0.32
0.68
Yes
No

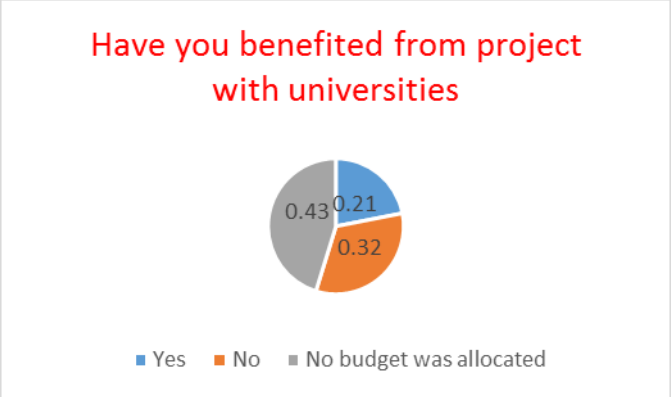

Budget for R&D
0.08
0.03
0.20
0.69
0-999
1000-9999
10000-49999
>50000

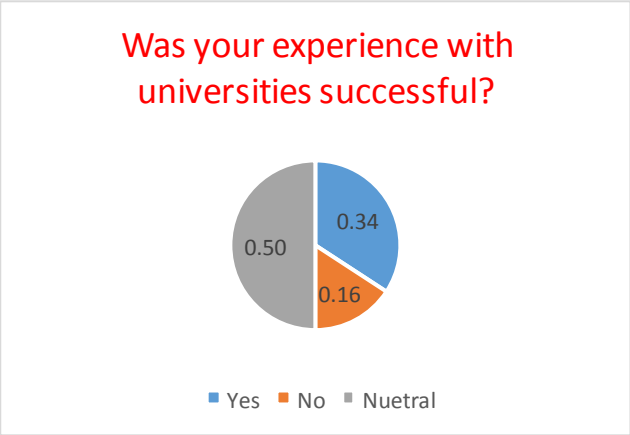

Who took the initiative to start communication
0.12
0.31
0.57
Company
University
Others

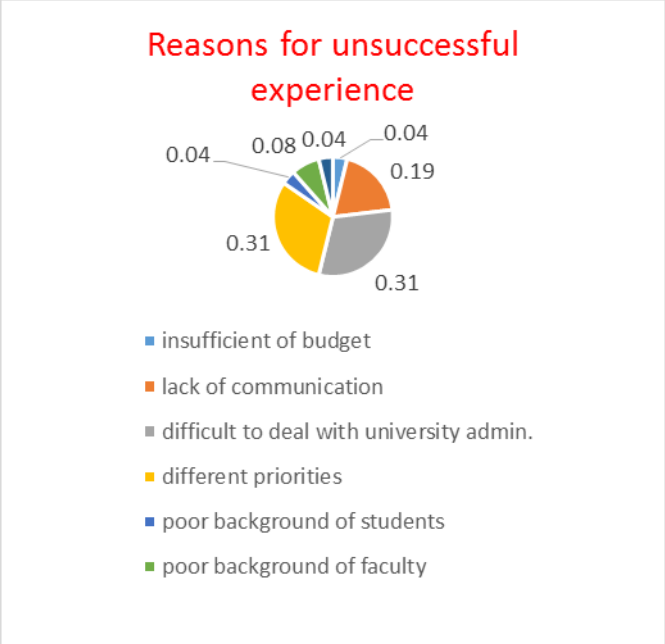

Area of collaboration
0.03
0.04
0.13
0.49
0.14
0.17
Students training
GP or MSc
FFF
Consultation
Investent in Applied Research
others

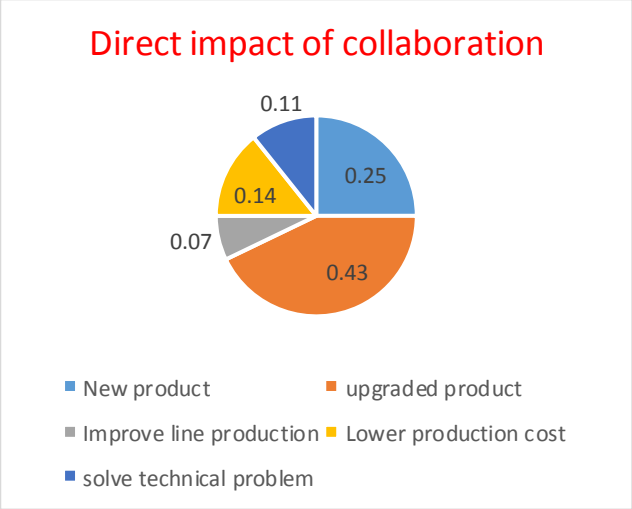

# of projects in collaboration with universities
0.05
0.05
0.05
0.08
0.12
0.63
1
2
3
4
5
>5

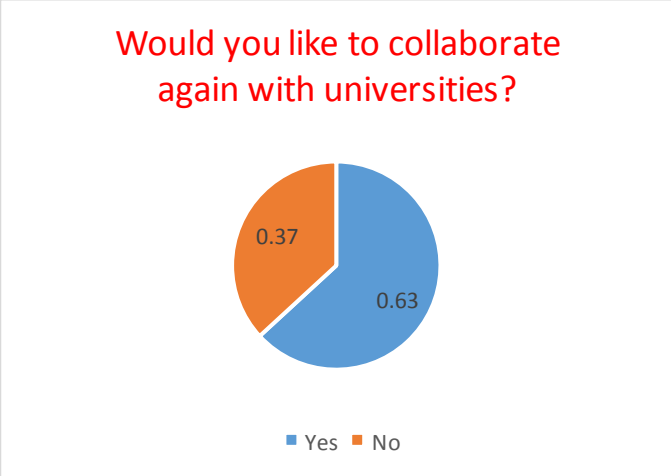

Average budget/project
0.01
0.00
0.09
0.87
0-999
1000-4999
5000-9999
10000-49999
>50000

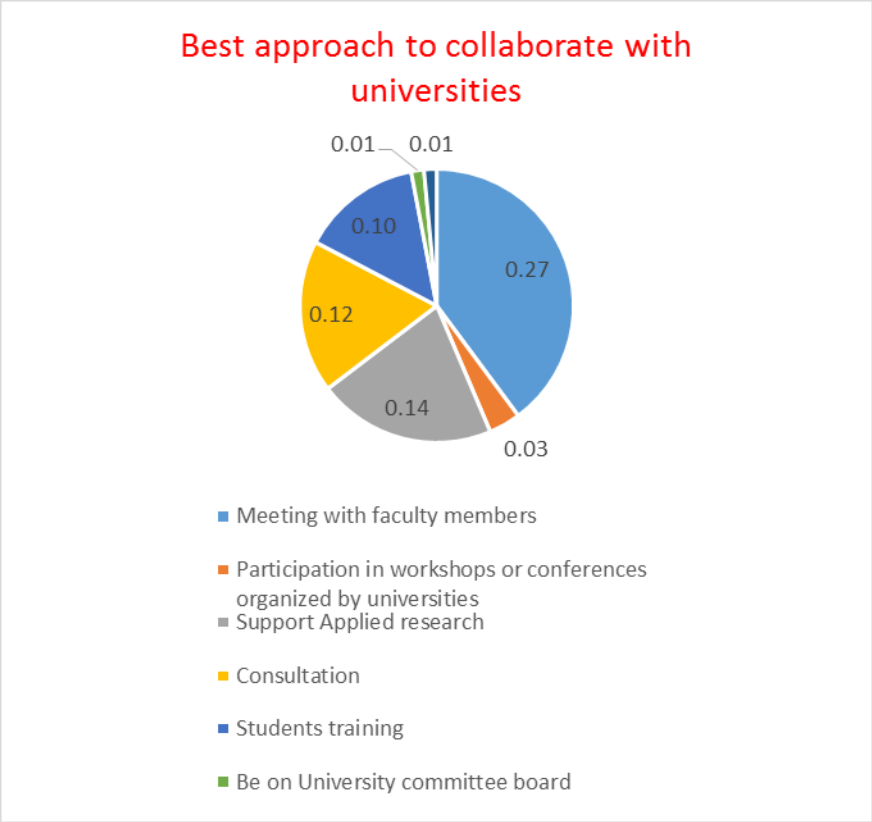

Have you benefited from project with universities
0.43
0.21
0.32
Yes
No
No budget was allocated

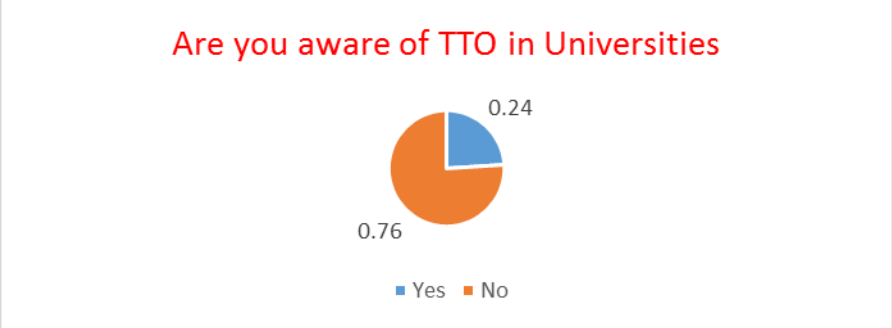

Was your experience with universities successful?
0.34
0.16
0.50
Yes
No
Nuetral

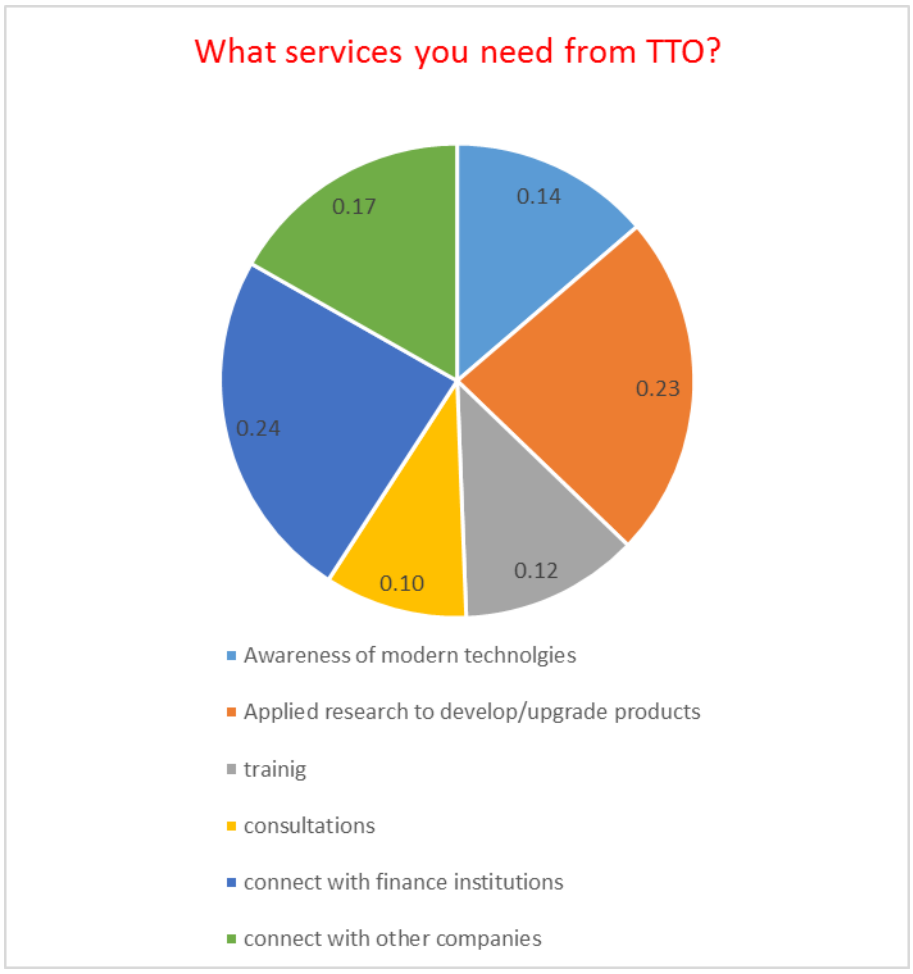

Reasons for unsuccessful experience
0.04
0.08
0.04
0.04
0.19
0.31
0.31
insufficient of budget
lack of communication
difficult to deal with university admin.
different priorities
poor background of students
poor background of faculty

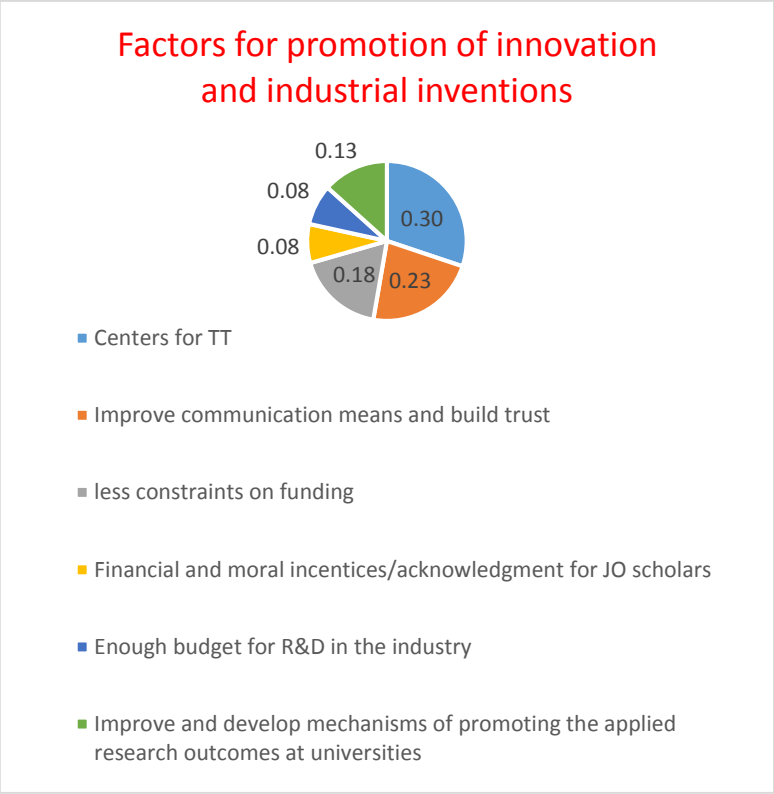

Direct impact of collaboration
0.11
0.25
0.14
0.07
0.43
New product
upgraded product
Improve line production
Lower production cost
solve technical problem

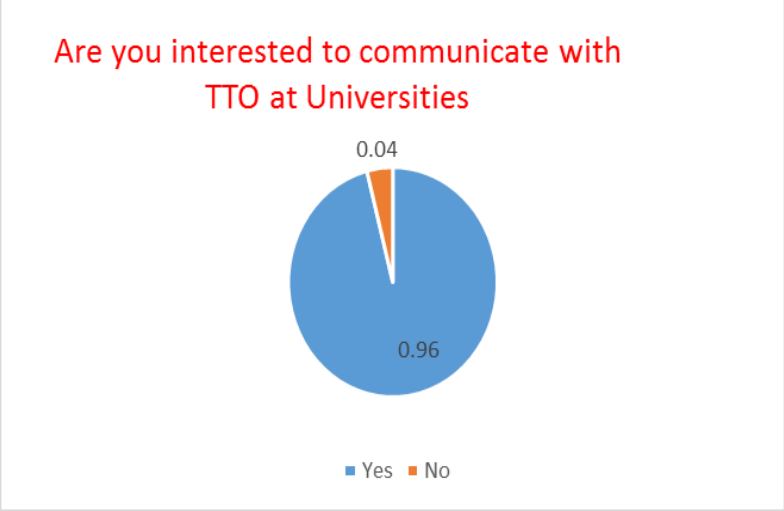

Would you like to collaborate again with universities?
0.37
0.63
Yes
No


Best approach to collaborate with universities
0.01
0.01
0.10
0.27
0.12
0.14
0.03
Meeting with faculty members
Participation in workshops or conferences organized by universities
Support Applied research
Consultation
Students training
Be on University committee board


Are you aware of TTO in Universities
0.24
0.76
Yes
No


What services you need from TTO?
0.14
0.23
0.12
0.10
0.24
0.17
Awareness of modern technolgies
Applied research to develop/upgrade products
trainig
consultations
connect with finance institutions
connect with other companies


Factors for promotion of innovation and industrial inventions
0.13
0.08
0.08
0.30
0.18
0.23
Centers for TT
Improve communication means and build trust
less constraints on funding
Financial and moral incentices/acknowledgment for JO scholars
Enough budget for R&D in the industry
Improve and develop mechanisms of promoting the applied research outcomes at universities


Are you interested to communicate with TTO at Universities
0.04
0.96
Yes
No