



# DIES-Seminar: Stakeholder Involvement in HE: Research, Innovation & Technology Transfer

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# Outline



- **Definitions: Research, Innovation, Technology Transfer.**
- **Technology Development Challenges in Developing countries**
- **Preparing graduates for the job market and certain services.**
- **Good practice for cooperation between Academia with industry**
- **Involving industry in development of curricula**
- **Research & Technology Transfer at Yarmouk University**

# Definitions:

## Research

It is the search for Knowledge through objective & systematic method of finding solution to problems.  
“Discovering new facts and verification of old ones”

**Research = knowledge  
Innovation  
Technology transfer**



# Definitions:

## Innovation:

is the process and outcome of creating something new, which is of value. It involves the **whole process** from opportunity identification, invention to development, prototyping, production marketing and sales.

## Through :

- Research output transferred to industry
- Knowledge Transfer from Universities – to the market
- Transferable technologies towards the economic environment
- Intellectual property; Patents
- Personnel training(Technology Transfer and Innovation)
- Innovative SMEs with high added value
- Promotion, formation of a mass innovation culture



# Definitions:

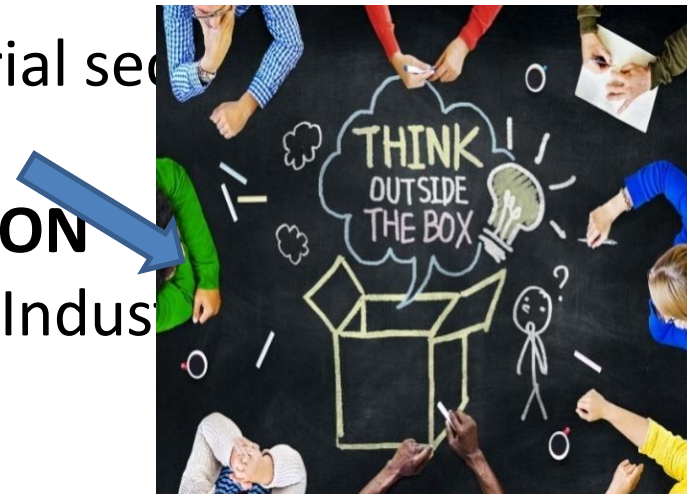
## Technology Transfer

The successful application and/or adaptation of a technology developed in one organization to meet the needs of one or more other organizations.

The relationships between innovators and developers of technology that result in new products or new process developments

### Tech Transfer Tools:

- ✓ Transfer of Knowledge and know-how, technology, or expertise from one party to another
- ✓ Transfer of technology from one industrial sector to another
- ✓ Transfer of RTD results to the market
- ✓ There must be an element of **INNOVATION**
- ✓ Licensing, spin-off creation, University/Industry Collaboration



# Why Technology Transfer



## Industry

- ✓ Revenue Generation
- ✓ Strategic Advantage
- ✓ Benefit local economy
- ✓ Student training = future employees

## University

- ✓ Use of inventions for public benefit
- ✓ Develop Technology
- ✓ Benefit national economy
- ✓ Reward, Retain & Motivate Academics
- ✓ Revenue generation
- ✓ Strengthen ties to Industry

# **Technology Development Challenges in Developing countries**

- **Limited capability to create globally competitive technologies**
- **Limited access to information on new technologies and innovations**
- **Poor R&D quality when compared to industrialized countries**
- **Lack of collaborative research**
- **Gap in R& D between universities and Industry**
- **Inability of SMEs to constantly cope with the rapidly changing technologies in developed countries**

# **Technology Development Challenges in Developing countries**

- **Lack of incentive, and capability to update existing technologies**
- **Limited fund to coordinate technological activities**
- **Poor networking of organizations and institutions in disseminating information on technologies.  
(specially SMEs)**
- **Shortage of trained and Skilled people and manpower**
- **Culture of IPR and patent issues**
- **Inadequate infrastructure required for technology creation**



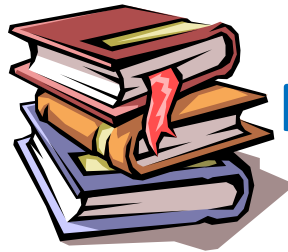
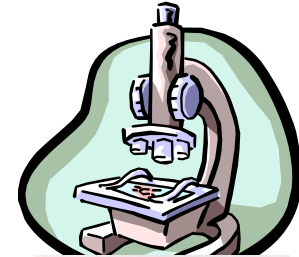
# **How to Overcome Challenges of Technology Transfer in Developing countries**

- **Establishment of Technology Centers in collaboration at international level**
- **Focus on specific industrial sectors**
- **Encourage application of technologies through awareness of need, economical requirements, & management**
- **Establishment of cooperative partnerships between key stakeholders**
- **Implementation of technology driven programmes**
- **Provide outreach programmes for SMEs for effective dissemination**
- **Focus on technology areas of national priorities.**
- **Design and implementation of technology transfer plans**
- **Dissemination of technology information**
- **Skill development activities**

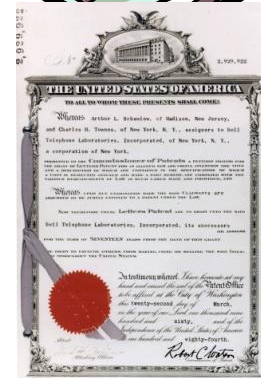
# Technology Development Challenges in Universities



Teaching vs. Applied Research



Publication vs. IP Protection



Academia vs. Industry



# **Importance of Technology Transfer & Innovation for Universities**

- **Recognition for Discoveries & Gaining status and prestige**
- **Enhancement of teaching programmes**
- **Improving market awareness & Enhancing private and public funding**
- **Increasing job opportunities**
- **Encourage & support research and multidisciplinary approach**
- **Generation of Income for Research**
- **Thinking longer term & Going global**
- **Outsourcing & Recruitment possibilities**
- **Establishment of cooperative and collaborative partnerships with key stakeholders**

# Preparing Graduates for the job market and certain services/support

The world changing  changing skill demands

- Automation
- Globalization
- Workplace change
- Demographic change
- Personal risk and responsibility (Job Security & Financial Planning)



# Automation

Any job where information can be digitized .....

Computers can follow directions better, faster, and cheaper than human beings, and the number of tasks computers can do grows every year.

Automation has big consequences for education



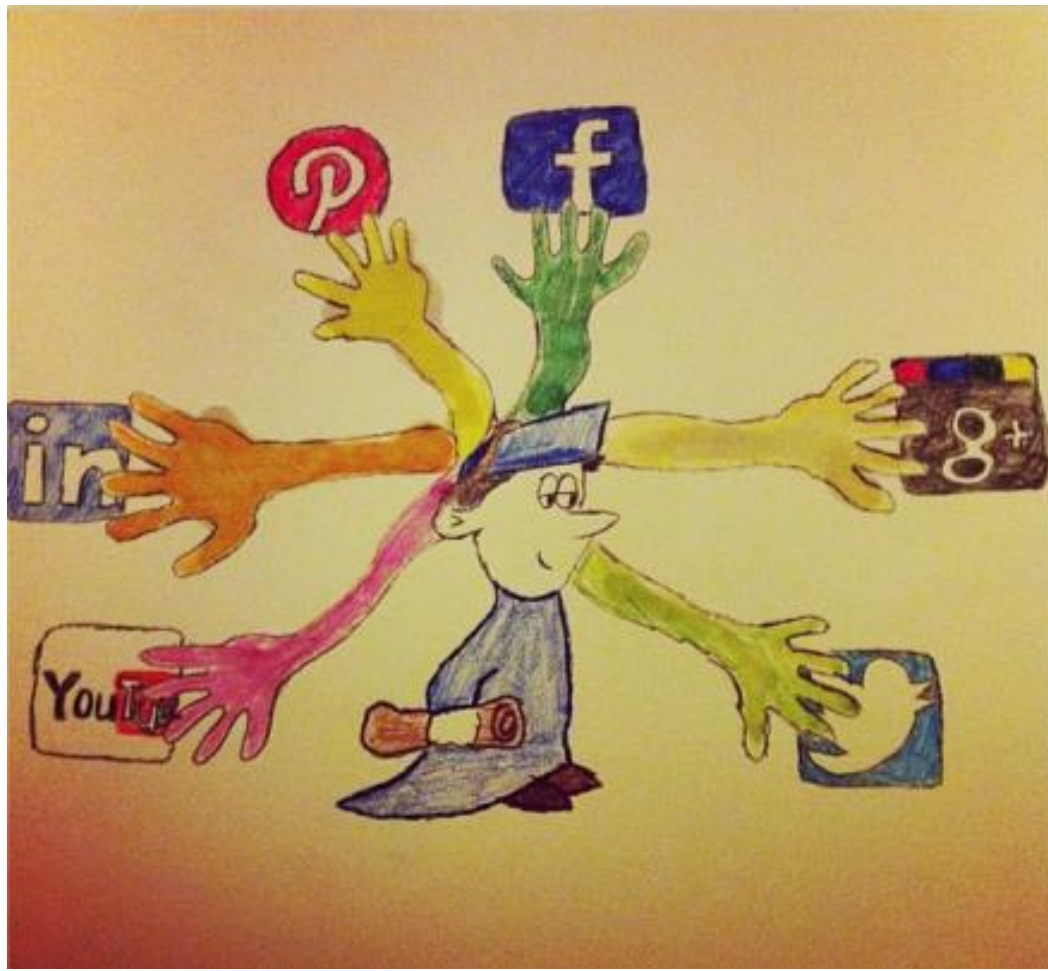
# Globalization

Technological advances (internet, interactive software, digital technologies) allow work to be done around globe



# Global Social Media Marketing

Cell phones for everyone, iPads, Kindles, Smart phones, iPod portable music and videos; Hand-held GPS, Text messaging, Blogs, Twitter, MySpace, FaceBook, Wikipedia, YouTube



# Workplace change

- More collaboration in the workplace (**Work teams are increasingly *global***)
- Jobs are less routine, predictable, and stable.

## Demographic change: More diverse population

Universities need to prepare students to interact in a diverse society and collaborate in a diverse work environment and global team work

### Collaborate with others:

Fill gaps in expertise and training

Add critical skills to the team

Recognition of contribution of full team





# Preparing Graduates for the job market and certain services/support

**What kind of knowledge and skills will graduates need?**

- **Postsecondary education and training** (Nearly two-thirds of new jobs will require postsecondary education or training)
- **Academic knowledge and skills**
- **The ability to use knowledge of math, English, science, civics etc. to meet real-world challenges.**
- **Broader competencies: Critical thinking and problem solving, communications and collaboration, creativity, self-sufficiency etc.**
- **Initiatives & Entrepreneurship**

# Good Practice for cooperation between Academia with industry

- ✓ Challenges in Industry-Academia Collaborations (awareness, identification, evaluation, protection and commercialization of ideas)
- ✓ Making Academia-Industry Interface Work
- ✓ Universities play a major role in the emergence of clusters in Industry (e.g patenting, venture funding, developing incubators and commercializing the ideas).
- ✓ Industry could be a Major source of research funding for academia
- ✓ Complementary capabilities and skill sets
- ✓ Industry trends and practices
- ✓ Create employable students “Industry-ready students”.

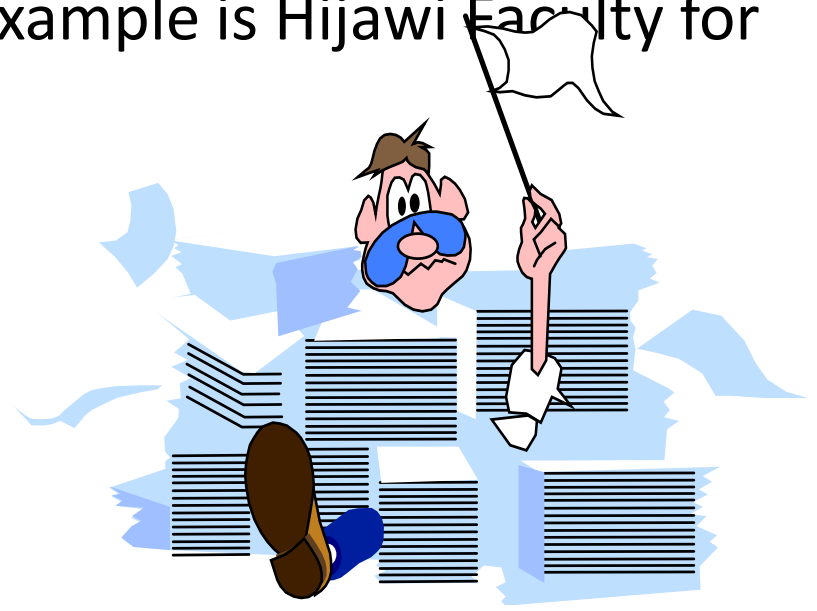
# Involving Industry in development of curricula

## ➤ Internship Program: A Win-Win Situation

Designed to help students develop vocational self-concept, acquire job relevant skills and provide informed career decision making ability .

➤ Designing the course curriculum and other value added programmes based on industry requirements.

➤ Curricula, faculty, infrastructure, pedagogy improvements in line with the industry's requirements ➡ demand skilled professional graduates (YU Best example is Hijawi Faculty for



# Yarmouk University

**Public, non-Profit HE organization  
Founded in 1976 by a Royal Decree**



# Yarmouk University



- **15 Faculties.**
- **2 Deanships**
- **18 Research Centers**
- **130 Research labs**
- **10 Incubators.**
- **42,000 students (62% females) (Including 5500 graduate students).**
- **4000 non-Jordanian students (~52 nationalities).**
- **1000 Faculty members (24% females).**
- **68 (undergraduate) programs.**
- **74 Master programs.**
- **18 PhD programs**

# Yarmouk University

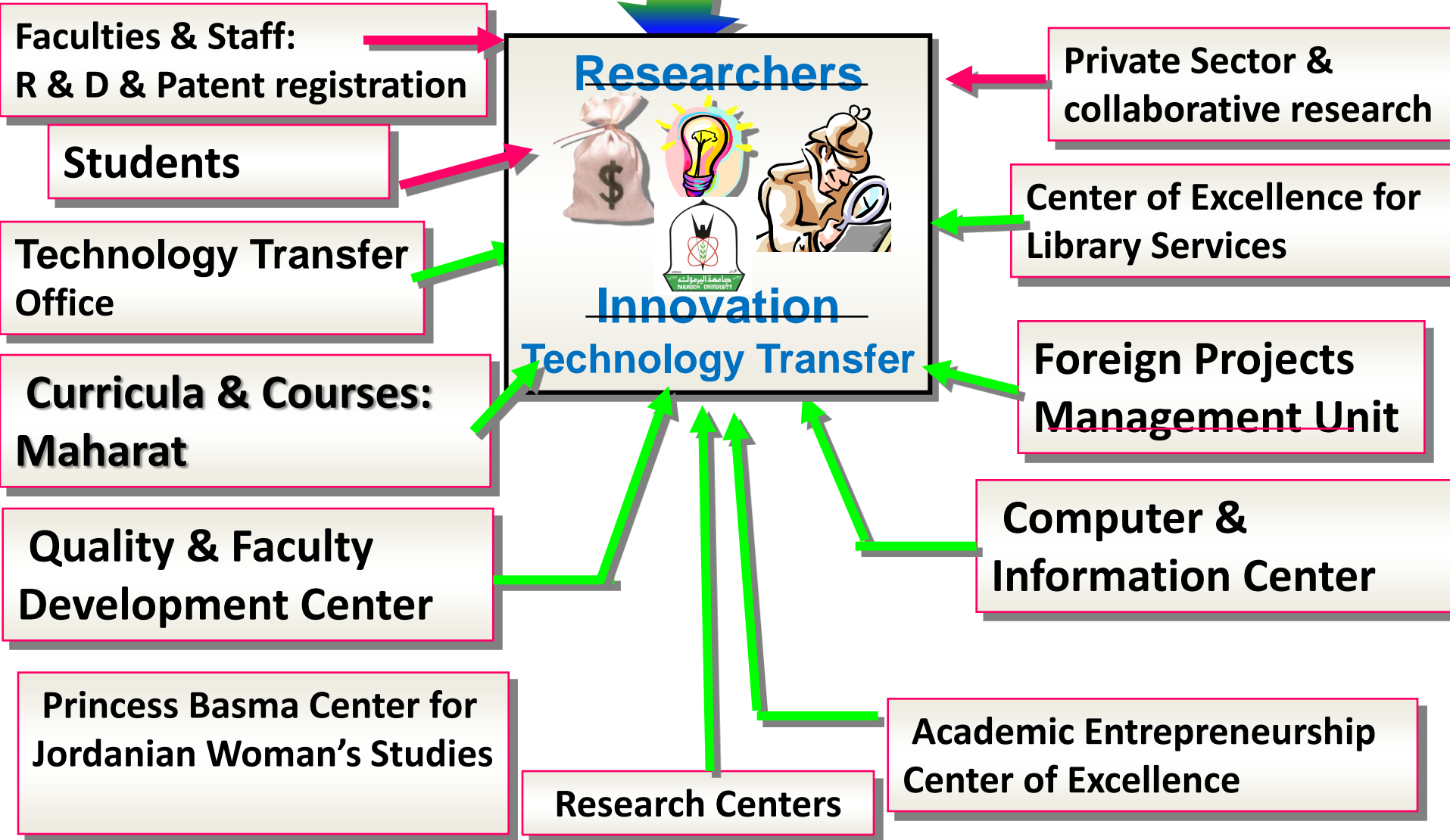


1. Faculty of Arts
2. Faculty of Sciences
3. Faculty of Education
4. Faculty of Physical Education
5. Faculty of Fine Arts
6. Faculty of Economics and Administrative Sciences
7. Hijjawi Faculty for Engineering Technology
8. Faculty of Law
9. Faculty of Shari's and Islamic Studies
10. Faculty of Archeology and Anthropology
11. Faculty of Information & Technology.
12. Faculty of Mass Communication
13. Faculty of Tourism & Hotels
14. Faculty of Pharmacy & Technological Pharmacy
15. Faculty of Medicine

## Deanships

- . Deanship of Scientific Research and Graduate Studies
- . Deanship of Student Affairs

# “Research & Technology Transfer at YU”



# “Research & Technology Transfer at YU

## Technology Transfer Office at YU (via HCST):

- Raises the visibility of University research, facilities and expertise
- Creates new funding opportunities through strengthened ties with industry & Bridging the Gap from Research to Commercialization
- Helps recruit and retain faculty interested in seeing their research translated into products
- Stimulates economic development: new products, new companies, new jobs
- Benefits the public





# “Research & Technology Transfer at YU Curricula, Courses & Job Market: Maharat

- ❑ Yarmouk University in collaboration with Business development Center (BDC) offer Maharat Course (3 credit hours) for students in their final year of graduation, where the graduates are trained and prepared for internships and employment opportunities at Jordanian businesses.
- ❑ It provides the right combination of motivation, opportunity and capacity building to empower students to compete in an increasingly competitive labor market. students are engaged in entrepreneurial activities, to enable them to shift from “job seekers” to “job creators” and become self-sufficient.



# “Research & Technology Transfer at YU

## Foreign Projects Management Unit



**Has executive responsibility for University research projects funded from outside the Univ.**

- 1. Project Development,**
- 2. Assist in Funding Resources,**
- 3. Training in Project Management and Related Competencies, Skills Competencies.**
- 4. Managing Funded Projects at the financial & administrative & reporting levels,**
- 5. Security and Ethics of Research,**
- 6. Technology Transfer & Marketing the Scientific Research Products.**
- 7. Education & Training (conducted several workshops about proposal writing & funding**



# “Research & Technology Transfer at YU

**Private Sector & collaborative research**

**Hijjawi faculty for Engineering Technology (Incubators)...9  
credit Hrs practical in Companies**

**Faculty of Economics and Administrative Sciences**

**Faculty of Sciences**

**Faculty of Fine Arts**

**Faculty of Information Technology and Computer Science**

**Faculty of Tourism and Hotel Management**

# “Research & Technology Transfer at YU

## Academic Entrepreneurship Center of Excellence

- ✓ Providing training opportunities for students and alumni through encouraging national companies and institutions to establish industrial incubators.
- ✓ Open communication and strengthening bridges of cooperation between the university and industry and business sectors to provide better services, and contribute to the quality towards a knowledge economy stronger.
- ✓ Process development for faculty and students to enhance their understanding and expertise in fact the work environment and foster a spirit of teamwork and the acquisition of technical skills and keep abreast of the latest developments.
- ✓ Encourage entrepreneurs to work with the latest technology and equipment to enable them to turn their ideas into industrial products, technical environment, serve the community and the national economy.



Thank You