



Towards a Future Vision for the Development of Higher Education in Jordan

**Professor Mohammad Amin Awwad
Vice President for Academic Affairs
Philadelphia University**

(English Version, Prepared on November, 2010)

The ultimate goal of this lecture is the development of higher education in Jordan to provide quality education for all students who complete successfully their secondary education. It should be cost effective for all, subject to public and private accountability on both governmental and civil levels, linked with society needs, and an effective factor in the development of science and knowledge nationally, regionally and internationally, according to international performance evaluation standards.

To achieve the above, the lecture will address the following:

1. Current scene of higher education and future expectations
 - 1.1 Quotation from His Majesty King Abdullah II Bin Al-Hussein's letter
 - 1.2 Fundamental standpoints and assumptions
 - 1.3 Statistics for embarking upon higher education in the world
 - 1.3.1 Statistics for the number of students joining higher education in the world
 - 1.3.2 Statistics for the number of students joining higher education in Jordan
 - 1.3.3 Statistics for the number of universities for each million in Jordan and selected countries of the world
 - 1.3.4 Statistics for the ratio of students to faculty members in Jordan and selected countries of the world
 - 1.3.5 Statistics for the ratio of administrators to faculty members in the Jordanian universities
 - 1.3.6 Statistics for the percentage of increase/ decrease in the number of students admitted to the Jordanian universities
 - 1.4 Statistics for the general secondary education certificate exam
 - 1.4.1 Statistics for students who sat for the General Secondary Education Certificate exam in the years from 98/99 to 2007/2008 and the annual pass percentage
 - 1.4.2 Statistics for the total number of students who sat for the General Secondary Education Certificate exam, the number of students who passed and the percentage of male and female students during the period 1998/1999-2007/2008.

- 1.4.3 Statistics for the pass percentage in the literary and scientific streams in ten years
- 1.4.4 Breakdown of General Secondary Education Certificate exam students in the literary and scientific streams during the period 1998/1999- 2007/2008 by sex and pass percentage
- 1.5 Ranking of the Jordanian universities on the map of the academic world
 - 1.5.1 Statistics for the top (100) universities in the Arab countries (according to Webometrics Ranking of world universities, 2009)
 - 1.5.2 Statistics for the ranking of world universities within top 50,100,150,200 universities according to the ranking conducted by Shanghai Jiao Tong university in 2008
 - 1.5.2.1 Indicators and weight in the Shanghai ranking list 2009
 - 1.5.3 Performance ranking of published scientific researches for some world universities
 - 1.5.3.1 2009 Performance ranking of papers for world universities
- 2. Human development indices
 - 2.1 Statistics for human development index and general expenditure on education and health
 - 2.2 Statistics for technology production and penetration in the Arab World and some countries
 - 2.3 Statistics for the patent grants and patents in force by origin and office, 2007
 - 2.4 Statistics for human development indices in the Arab World and some selected regions of the World
- 3. Online Education
 - 3.1 Its advantages and disadvantages
 - 3.2 Statistics for the number of students joining online education post secondary education in the USA
 - 3.3 Views and studies on online education
 - 3.4 Selected main online education universities in the USA
 - 3.5 Selected world open universities
 - 3.5.1 The National University of Korea
 - 3.5.2 Payame Noor University in Iran
 - 3.5.3 Anadolu University in Turkey
 - 3.5.4 The British Open University

- 3.5.5 Indira Gandhi National Open University
- 3.5.6 Harvard University Extension School
- 4. Open Course Ware
 - 4.1 MIT Open Course Ware
 - 4.1.1 Use scenario and percentage
 - 4.1.2 Comparison between 2005 Report and 2009 Report
 - 4.2 Open Course Ware Specializations at MIT
 - 4.3 Emergence of other open programmes, materials and media in America and some world countries
 - 4.3.1 China Open Resources for Education Project
 - 4.3.2 Dspace at MIT
 - 4.3.3 The Public Library of Sciences Project (PLOS)
 - 4.3.4 Microsoft Research in Collaboration with MIT
 - 4.3.5 Mirror Sites Project
- 5. Blended Learning
 - 5.1 Introduction
 - 5.2 Reasons for the prevalence of Blended Education
 - 5.3 Blended Education requirements
 - 5.4 Internet penetration speed
 - 5.5 Blended Education Economies / A Hypothetical Example
 - 5.5.1 Standpoints and Assumpoints
 - 5.5.2 Traditional / Face to Face education scenario
 - 5.5.3 Blended Education Scenario
- 6. Suggestions for the development of higher education

1. Current scene of higher education and future expectations

1.1 Quotation from His Majesty King Abdullah II Bin Al-Hussein's letter

"The necessity of adopting policies and programmes for the development of higher education, commensurate with the best international standards and practices. These policies and programmes should also contribute to enhancing the competitiveness of our educational sector in the region as well as the world, in addition to the importance of adopting advanced educational policies that would be reference to admission bases to our universities, and that would aim at modernizing curricula and teaching methods, with a view to improving the quality of higher education outputs in Jordan, and graduating specialized competencies that are capable of catering for the needs of the local, regional and international markets.

We hope that this conference will come up with strategies and funding sources that will constitute alternatives to formal universities with a view to maintaining high quality education and ensuring its ongoing development. We also hope that a well-established educational environment will be secured to ensure essential principles such as equal educational opportunities to the Jordanian youth".

(From His Majesty King Abdullah II Bin Al-Hussein's letter to His Excellency the ex-primier Ma'rouf Al-Bakheet on 8 Feb.2007, on the development of higher education)

1.2 Fundamental standpoints and assumptions

- Success indicator in the knowledge society in the twenty first century is closely linked with preparing highly educated and well-trained man power and its role in building human capacity.
- Labor market in the twenty first century requires man power that can use modern technology quite well, and that is capable of innovation and creativity, problem solving, communicating and working with others in a team spirit. This is what universities and higher education institutions should aim to realize.
- Investment in education in general, and in higher education in particular, is more important and more feasible because today's students are the society's leaders and businessmen, its scientists and doctors, its thinkers and the makers of its cultural and scientific future.
- It is not the duty of universities solely to build the human wealth of a country, and to effect technological transformation in it, but they are also the main actuator of its social and cultural transformation and placing it on the world map.
- Increasing investment in higher education now, despite the fact that the world suffers from economic slow down/regression, has become more necessary than any other time as universities and research centres in them are the competent parties to submit suitable solutions to go out of this crisis.
- The universities and educational institutions we want, must seek excellence in allowing stimulating opportunities for teaching and learning, conducting scientific researches which are based on national needs in particular, and man's needs wherever he is in general, dealing with more important issues to preserve public health, water, environment, and attain agricultural, industrial and medicinal development, and to keep abreast of all forms and fields of scientific advancement. They should be democratic institutions

in their governorship, believe in equal opportunities, and take into consideration the interests of all parties concerned with the educational process such as students, their parents, faculty members, administrative personnel, boards of trustees, local community and investors.

- Policies and practices which support/ increase our national investment in education and training may assist in promoting democracy and equality and at the meantime allow more economic opportunities.
- Higher education institutions enhance competition in thinking and innovation, in industry, and in expanding democracy base, and pave the way to governorship and sound management in economy, politics, and promote the culture of initiative taking, justice and equal opportunities.

1.3 Statistics for embarking upon higher education in the world *

1.3.1 Statistics for the number of students joining higher education in the world

Year	Number
1991	68 millions
2004	132 millions
2025	150 millions (estimated)

* *Kapur, Devesh and Mergan Crowley. (2008) Beyond the ABCs: Higher Education in Developing Countries.*

1.3.2 Statistics for the number of students joining higher education in Jordan **

Year	Total No.	Percentage of the Population	Public Universities	Private Universities
2007/2008	226401	3.77 %	167754	58647
2008/2009	235819	3.99 %	174542	61277

It is expected that the number of students joining higher education in Jordan by 2020 will mount to (353720) male and female students.

1.3.3 Statistics for the number of universities for each million in Jordan and selected countries of the world

Country	Universities #	Population in Millions	Total Universities #
Jordan	4	6	26
USA	17	308	5236
Arab Countries	1.18	330	390
China	0.88	1335	1174

*** Data included in this table and all tables in this study pertaining to higher education were computed by referring to the annual statistical report on education in Jordan 2007/2008 which was issued by the Department of Statistics and Information, Directorate of Information Technology 2009.*

1.3.4 Statistics for the ratio of students to faculty members in Jordan and selected countries of the world

Country	Ratio
Jordan	1:31 *
USA	1:12
UK	1:15
Arab Countries	1:29

1.3.5 Statistics for the ratio of administrators to faculty members in Jordanian universities

Institution	Number of Administrators	Faculty Members	Ratio
A All Universities	17806	7283	1:2.44
B Public Universities	14510	4772	1:3.04
C Private Universities	3314	2511	1:1.32
D Mu'tah University	2468	518	1:4.76
E Balqa Applied University	2819	374	1:7.5

The ratio of non-academic personnel to faculty members as shown in this table shows that it is too high. Accordingly, public universities

* 1:35 in public universities **

* 1:23 in private universities

** This means that public universities will need 7534 faculty members if accreditation standards will apply to them. This means an annual increase, starting from the academic year 2010/2011, of 2583 faculty members as the faculty members at public universities is 4951 and private universities is 2662.

should reconsider this issue and decrease this ratio gradually and in a well-considered manner until it reaches 1:1 which would decrease financial burden and accumulated indebtedness of these universities. If we assumed that the reasonable ratio is 1:1, the annual savings of the universities would be J.D. 51.315.000 (fifty one million, three hundred and fifteen thousand dinars) assuming that the cost of each employee is five thousand dinars per year.

1.3.6 Statistics for the percentage of increase/ decrease in the number of students admitted to the Jordanian universities *

S.No.	University	Percentage
1	The University of Jordan	94.82 % (4112/8011)
2	Yarmouk University	115 % (2996/6453)
3	Mu'tah University	124.5 % (2579/3212)
4	University of Science and Technology	71.18 % (2634/4509)
5	Hashimiya University	- (3.41) (4322/4175)
6	Al al-Bait University	- (32.5) (3402/2299)
7	Balqa Applied University	112.3 % (3603/7650)
8	Al-Hussein Bin Talal University	76.66 % (1024/1809)
9	College of Educational Sciences	4.6 % (152/159)

* Data about universities (1,2,3) are from 96/97 to 2007/2008, increase average is 82.47 % (9687/17676).

- Data about the University of Science and Technology are for the period 2002/2003-2007/2008.

- Data about the remaining universities are for the period 2002/2003-2007/2008. The percentage of the increase is 15.26 % (22747/26216).

- The total number of the students who were admitted in 2007/2008 is 48375 students (74.3 %) of the students who passed the general secondary education certificate exam, (65059) students.

1.4 Statistics for the General Secondary Education Certificate exam

**1.4.1 Statistics for students who sat for the General Secondary
Education Certificate exam during the period 1998/1999
- 2007/2008 and the annual pass percentage ***

School year		Total No. of students who sat for the exam	Total No. of students who passed the exam	Pass percentage	Difference from the preceding year
98-99	Total	97711	49143	50%	
	Males	47521	20474	43%	
	Female	50190	28669	57%	
99-2000	Total	104773	52652	50%	+ 7.2%
	Males	52030	22433	43%	+ 9.5%
	Female	52743	30219	57%	+ 5.1%
2000-2001	Total	103495	45187	44%	- 1.2%
	Males	52015	18355	35%	- 0.02%
	Female	51480	26832	52%	- 2.4%
2001-2002	Total	117371	46117	39%	+ 13.4%
	Males	59669	18900	32%	+ 14.7%
	Female	57702	27217	47%	+ 12.1%
2002-2003	Total	134758	50856	38%	+ 14.8%
	Males	69949	21377	31%	+ 17.2%
	Female	64809	29479	45%	+ 12.3%
2003-2004	Total	160897	56714	35%	+ 19.4%
	Males	81725	24401	30%	+ 16.8%
	Female	79172	32313	41%	+ 22.2%
2004-2005	Total	222685	62489	28%	+ 38.4%
	Males	114545	27708	24%	+ 40.2%
	Female	108140	34781	32%	+ 36.6%
2005-2006	Total	140326	65712	47%	- 37%
	Males	74982	29470	39%	- 34.5%
	Female	65344	36242	55%	- 39.6%
2006-2007	Total	144642	66844	46%	+ 3.1%
	Males	76692	29802	39%	+2.3 %
	Female	67950	37042	55%	+ 4%
2007-2008	Total	129822	65059	50%	-10.2%
	Males	68413	28841	42%	- 10.8%
	Female	61409	36218	59%	- 9.6%

** This Table and all other tables pertaining to secondary education included in this study have been prepared on the basis of statistics issued by the Ministry of Education.*

The percentage of the increase in the number of students who sat for the **General Secondary Education Certificate** exam in 98/99 and 2009/2010 is 43.79% and the number of students who sat for the exam in the current year is 140.000 students. This entails additional cumulative obligations on the part of universities.

1.4.2 Statistics for the total number of students who sat for the General Secondary Education Certificate exam, the number of students who passed and the percentage of male and female students for the years from 1998/1999 to 2007/2008

Students who sat for the exam		Students who passed the exam		The percentage of students who passed the exam	
Male	Female	Male	Female	Male	Female
697541	658931	241761	319012	34.65%	49%
Total					
1356480		560773		41.34%	

It becomes evident from the above table that:

- The pass percentage (41.34 %) is too low which indicates, among others, a major drawback in the curricula or in the teaching methods or in both of them.
- It is necessary to reconsider the teaching material constituents and their teaching methods. It is also necessary to rehabilitate the teaching staff.
- It is incumbent to enhance the teachers' competencies. This can be achieved not only through their training in the teaching methods but also through enhancing their knowledge of the subjects and sciences they teach.
- There is a noticeable preponderance in the pass percentage among female students in comparison with the pass percentage among

male students. This motivates female students to pride themselves on their success, and it becomes incumbent upon male students to exert more efforts and improve their performance. This fact may be one of the reasons for the increase of the number of female students in comparison with male students at the Jordanian universities especially the public ones where the percentage reaches about 60 %.

1.4.3 Statistics for the pass percentage in the literary and scientific streams in ten years

School year	Literary			Scientific		
	Taker	Pass	Pass Percentage	Taker	Pass	Pass Percentage
1998-1999	47686	23171	49 %	31605	17760	56 %
1999-2000	53066	26108	49 %	33344	18451	55 %
2000-2001	55907	28038	50 %	28467	15948	56 %
2001-2002	66304	24320	37 %	29998	16040	53 %
2002-2003	73135	26651	36 %	37351	18189	49 %
2003-2004	85152	29765	35 %	47352	18759	40 %
2004-2005	104062	26995	26 %	66046	21114	32 %
2005-2006	61189	26110	43 %	40084	22790	57 %
2006-2007	58126	23271	40 %	39099	23999	61 %
2007-2008	45255	19521	43 %	36570	23226	64 %
Total	649882	253950	%40.8	389916	196276	%52.3

**1.4.4 Breakdown of General Secondary Education Certificate exam
students in the literary and scientific streams for the years 1998/1999
to 2007/2008 by sex and pass percentage**

School Year		Literary			Scientific		
		Taker	Pass	Pass Percentage	Taker	Pass	Pass Percentage
1998-1999	Total	47686	23171	49 %	31605	17760	56 %
	Male	19719	7364	37 %	17888	9117	51 %
	Female	27967	15807	57 %	13717	8643	63 %
1999-2000	Total	53066	26108	49 %	33344	18451	55 %
	Male	22868	8728	38 %	19272	9698	50 %
	Female	30198	17380	58 %	14072	8753	62 %
2000-2001	Total	55907	28038	50 %	28467	15948	56 %
	Male	24919	9549	38 %	16653	8260	50 %
	Female	30988	18489	60 %	11814	7688	65 %
2001-2002	Total	66304	24320	37 %	29998	16040	53 %
	Male	30380	7789	26 %	17659	8181	46 %
	Female	35924	16531	46 %	12339	7859	64 %
2002-2003	Total	73135	26651	36 %	37351	18189	49 %
	Male	33886	8975	26 %	22395	9289	41 %
	Female	39249	17676	45 %	14956	8900	60 %
2003-2004	Total	85152	29765	35 %	47352	18759	40 %
	Male	38393	10707	28 %	28020	9781	35 %
	Female	46759	19058	41 %	19332	8978	46 %
2004-2005	Total	104062	26995	26 %	66046	21114	32 %
	Male	46688	9780	21 %	37320	10819	29 %

	Female	57374	17215	30 %	28726	10295	36 %
2005-2006	Total	61189	26110	43 %	40084	22790	57 %
	Male	28365	9012	32 %	22515	11485	51 %
	Female	32824	17098	52 %	17569	11305	64 %
2006-2007	Total	58126	23271	40 %	39099	23999	61 %
	Male	25668	7642	30 %	21549	11923	55 %
	Female	32458	15629	48 %	17550	12076	69 %
2007-2008	Total	45255	19521	43 %	36570	23226	64 %
	Male	18840	5891	31 %	20111	11311	56 %
	Female	26415	13630	52 %	16459	11915	72 %

These statistics show that the pass percentage among female students (number of passes / number of takers) is very much higher than that of male students in each year, and in both literary and scientific streams. This bolsters the scientific advancement in the Kingdom, particularly when female students join bachelor's degree and graduate studies programmes. The decline in the pass percentage among male students goes back to many reasons and needs careful consideration.

1.5 Ranking of the Jordanian universities on the map of the academic world

1.5.1 Statistics for the top (100) universities in the Arab countries (According to Webometrics Ranking of world universities, 2009*)

Country	Number of Universities
Kingdom of Saudi Arabia	18
Egypt	15
United Arab Emirates	7
Lebanon	6
Kuwait	2
Palestine	8
Jordan	10
Morocco	12
Bahrain	2
Sultanate of Oman	1
Qatar	1
Sudan	3
Yemen	1
Libya	2
Syria	3
Algeria	8
Tunisia	1

* <http://www.webometrics.info/top100continentGSP?cont=aw>

1.5.2 Statistics for the ranking of world universities within the top 50,100,150,200 universities according to the ranking conducted by Shanghai Jiao Tong University in 2008

S.No.	Country	50	100	150	200
1	USA	36	54	70	89
2	United Kingdom	05	11	16	22
3	Japan	02	04	07	09
4	Switzerland	01	03	05	06
5	Israel	00	01	04	05
6	Canada	02	04	06	06
7	France	02	03	07	08
8	Denmark	01	02	02	03
9	Sweden	00	04	04	04
10	Netherlands	01	02	05	09
11	Germany	00	06	10	14
12	Norway	00	01	01	01
13	Finland	00	01	01	01
14	Australia	00	03	05	07
15	Russia	00	01	01	01
16	Belgium	00	00	04	04
17	Italy	00	00	03	05

1.5.2.1 Indicators and weight in the Shanghai ranking list 2009

Criterion	Indicators	Weight
Quality of education	1. Number of alumni who earned a Nobel Prize or Fields Medal since 1901.	10 %
Quality of staff	2. Number of researchers who earned a Nobel Prize in physics, chemistry, medicine or economics and/or the Fields Medal in mathematics since 1911.	20 %
	3. Number of highly cited researchers in the fields of life science, medicine, physics, engineering and social sciences.	20 %
Research Output	4. Number of articles published in Nature and Science between 2004-2008.	20 %
	5. Number of articles listed in Thompson Scientific's <i>Science Citation Index Expanded</i> and its <i>Social Sciences Citation Index</i> in 2008. Added to the article count in 2006, listings in <i>Social Sciences Citation Index</i> the count double.	20 %
Size of the institution	6. The weighted score of the above five indicators divided by the number of full-time equivalent academic staff. If the number of academic staff for institutions of a country cannot be obtained, the weighted scores of the above five indicators is used.	

* http://www.universityrankings.ch/en/methodology/shanghai_jiao_tong

1.5.3 Performance ranking of published scientific researches for some world universities

(According to the study conducted by the Higher Education Evaluation and Accreditation Council of Taiwan 2009)

Country	1-100	101-200	201-300	301-400	401-500
USA	57	87	115	139	162
Germany	02	18	29	36	45
UK	08	19	26	34	36
Japan	04	08	12	20	29
France	02	05	11	15	20
China	00	03	07	10	15
Korea	01	02	05	08	10
Finland	01	01	02	05	06
Israel	00	03	04	05	02
India	00	00	00	01	02
Singapore	01	01	02	02	02
Thailand	00	00	00	00	01
Russia	00	00	01	01	01

We notice here that USA and UK universities are more advanced in general, particularly in the field of scientific research. This may be the reason that lies behind the fact that India and China dispatch more than 50 % of their scholarship holders to join graduate studies in these two countries.

1.5.3.1 2009 Performance ranking of papers for world universities

Criteria	2009 Overall Performance Indicators	Weighting	
Research productivity	Number of articles of the last 11 years (1998-2008)	10	20
	Number of articles of the current year (2008)	10	
Research impact	Number of citations of the last 11 years (1998-2008)	10	30
	Number of citations of the last 2 years (2007-2008)	10	
	Average number of citations of the last 11 years (1998-2008)	10	
Research excellence	H-index of the last 2 years (2007-2008)	20	50
	Number of Highly Cited Papers (1998-2008)	15	
	Number of articles of the current year in high-impact journals (2008)	15	

2. Human development indices

2.1 Statistics for human development index and general expenditure on education and health *

No.	Country	Human Development Index Ranking	Percentage of Expenditure on Health from Gross National Product (2004)	Percentage of Expenditure on Education from Gross National Product (2002-2005)
1	Iceland	1	8.3	8.1
2	Sweden	6	7.7	7.4
3	Japan	8	6.3	3.6
4	USA	12	6.9	5.9
5	UK	16	7.0	5.4
6	Israel	23	6.1	6.9
7	Kuwait	33	2.2	5.1
8	Qatar	35	1.8	1.6
9	UAE	39	2.0	1.3
10	Libya	56	2.8	2.7
11	Oman	58	2.4	3.6
12	China	81	1.8	1.9
13	Turkey	84	5.6	3.7
14	Jordan	86	4.7	4.9
15	Lebanon	88	3.2	2.6
16	Tunisia	91	2.8	7.3
17	Iran	94	3.2	4.7
18	Algeria	104	2.6	-
19	Syria	108	2.2	-
20	Egypt	112	2.2	-
21	Moroco	126	1.7	6.7
22	India	128	0.9	3.8
23	Sudan	147	1.5	-
24	Saudi Arabia	61	2.5	6.8

* *Human Development Report 2007-2008*, Table 19 : 294 - 297

We notice here that expenditure on education in Tunisia is the highest among the Arab countries, and that Jordan ranks 5th after Tunisia, Saudi Arabia, Morocco, and Kuwait. But we have to take into consideration that the gross national product of the Arab countries referred to in this table is as follows (in million dollars):

Saudi Arabia : 469	Jordan : 20	Algeria : 159
Kuwait : 158	Lebanon : 29	Sudan : 57
Qatar : 102	Tunisia : 40	Egypt : 162
Libya : 89	Syria : 54	UAE : 262
Oman : 53	Morocco : 89	

World Monetary Fund Statistics 2008

Consequently, the individual's share of the expenditure on education in the Kingdom of Saudi Arabia (its population is three times Tunisia's population) is much higher than the individual's share of the expenditure on education in Tunisia. We also notice that expenditure on health in the developed countries is more than the expenditure on education.

2.2 Statistics for technology production and penetration in the Arab World and some countries *

S.No.	Country	Mobile Phone (for each one thousand persons) 2005	Internet Users (for each one thousand persons) 2005	Percentage of expenditure on Research and Development from total gross national product (2000-2005)	Researchers (for each million) (1990-2005)
1	Finland	997	534	3.5 %	7832
2	USA	680	630	2.7 %	4605
3	Israel	1120	470	4.5 %	--
4	Kuwait	939	276	0.2 %	--
5	Qatar	882	269	--	--
6	UAE	1000	308	--	--
7	Bahrain	1030	213	--	--
8	Libya	41	36	--	361
9	Oman	519	111	--	--
10	Saudi Arabia	575	70	--	--
11	Turkey	605	222	0.7%	341
12	Jordan	304	118	--	1927
13	Lebanon	277	196	--	..
14	Tunisia	566	95	0.6	1013
15	Iran	106	103	0.7	1279
16	Algeria	416	58	--	--
17	Palestine	302	67	--	--
18	Syria	155	73	--	29
19	Egypt	184	68	0.2	493
20	Morocco	411	152	0.6	..
21	Developing countries	86	..	1.0	--
22	Arab Countries	88	0.9	--	--
23	Countries of the Organization	785	445	2.4	3096

	for Cooperation and Economic Development (OCED)				
24	The World	340	136	2.3	--

This table reveals that Jordan surpasses each of Turkey, Tunisia, Algeria, Libya, Iran and Syria in respect of the number of researchers for each million of the population. It also reveals that the highest expenditure on research and development is in Israel followed by Finland then USA, whereas it does not reach 1 % in the Arab countries. This must be one of the main reasons that non of the Arab universities appeared within the top 500 universities in scientific research (vide 1.5.3).

** Human Development Report 2007-2008, Table 13:273-276 (in Arab Human Development Report 2009, Table 12:240)*

2.3 Statistics for the patent grants and patents in force by origin and office, 2007 *

According to National Office				According to Country of Origin	In force in National Office
Country	No.	Resident	Non-Resident		
1. Algeria	214	--	--	1	852
2. Egypt	300	80	220	93	300
3. Jordan	--	--	--	15	--
4. Kuwait	--	--	--	8	--
5. Lebanon	--	--	--	13	--
6. Morocco (2006)	699	128	571	133	--
7. Sultanate of Oman	--	--	--	1	--
8. Saudi Arabia	274	17	257	73	--
9. Syria	--	--	--	1	--
10. Tunisia	--	--	--	3	--
11. UAE	--	--	--	26	--
12. Bahrain	--	--	--	1	--
13. Iran	--	--	--	6	--
14. Turkey	628	296	332	391	9015
15. USA	157283	79527	77756	146065	1815531
16. China	67948	31945	36003	33410	271917
17. Japan	164954	145040	19914	232449	1206335
18. Israel	2489	372	2117	2473	--
19. Malaysia	6983	338	6645	572	--
20. Norway	1774	429	1345	1550	17801
21. Finland	921	643	278	4555	44378
22. Russia	23028	18431	459	19009	129910
23. Korea	123705	91645	32060	106611	566965
24. Singapore	7478	469	7009	1244	--

This table reveals a noticeable weakness in the number of patents in the Arab World whether they were granted by the national offices or according to the country of origin. In Finland which population is 20 % of Saudi Arabia's population, and 7.8 % of Egypt's population, the number of patents mounted to (4555) compared with (73) in Saudi Arabia and (63) in Egypt.

-
- *World Intellectual Property Indicators, 2009, Table ST.2, pp.92-94*

2.4 Statistics for human development indices in the Arab World and selected regions of the world*

Country	Percentage of Literacy for the Age Group After Fifteen (1995-2005)	Percentage of Joining Basic, Secondary, and Post Secondary Education (2005)	Education Index	Gross National Product Index
Kuwait	93.3	74.9	0.871	0.93
Lebanon	--	84.6	0.871	0.671
Jordan	91.1	78.1	0.868	0.67
Qatar	89	77.7	0.852	0.938
UAE	88.7	59.9	0.791	0.925
Tunisia	74.3	76.3	0.75	0.739
Syria	80.8	64.8	0.755	0.607
Egypt	71.4	76.3	0.32	0.629
Saudi Arabia	82.9	76	0.806	0.844
Organization for Cooperation and Economic Development (OCED) Countries	--	88.6	0.888	0.912
High Income OCED Countries	--	93.5	0.906	0.961
Medium Income OCED Countries	89.9	73.3	0.843	0.619
All World Countries	78.6	67.8	0.750	0.761

This table shows that Jordan comes in the second position after Kuwait in respect of literacy, and it is likely to reach the saturation point (95), and it comes 3rd in respect of post secondary education intake and in education in general.

* UNDP, HDR 2007-2008, Table 1: pp229-232, in Arab Human Development Report 2009, p.229

3. Online Education

3.1 Its advantages and disadvantages

Advantages	Disadvantages
Providing distinguished learning materials prepared by specialized groups	Absence of face to face interaction between the instructor and students
Adopting distinguished learning methods and media	Society's culture towards online education
Exceeding time and place restrictions	Teaching structure and software are fundamental issues for the success of online education, but this is a costly issue
Allowing learning and training opportunities to large numbers of learners	
Focusing on answering questions, creative thinking, and learning skills	
Eliminating shyness factor among students and allowing them the opportunity to interact with their peers through the internet and other alternate media	
Facilitating constant communication among instructors and students themselves through e-mail	
Students learn at the time that suits them inside and outside classrooms and at work places	
Enabling educational institutions to evaluate performance in a better and faster way	
The possibility of reviewing and developing course materials as all data are available and accessible to students, educationists and academic experts	
Providing distinguished educational services and student counseling through modern communication systems among students and between students and instructors	

3.2 Statistics for the number of students joining online education post secondary education in the USA *

Year	Number
2000	194580
2001	315219
2002	483113
2003	701295
2004	936727
2005	1214000
2006	1518750

The number of distance learning students in the world in 2002/2003 was nine millions, four millions of them were in Online Education in the Commonwealth countries, but their number in 2005 mounted to (6) millions. *

* Foster and Carnevale ,2007 .URL :<http://chronicle.com/weekly/v53/34a04901/htm>.

3.2 Views and studies on Online Education

- The study carried out by Professor Bob Bernard and his colleagues of the education technology team at Concordia University in Montreal, in which they conducted an analytical study of hundreds of cases wherein students were dealt with electronically in different ways to differentiate among three patterns of interaction, showed that the increase of interaction between the student and the subject matter content has a major impact on learning, and this was followed by the interaction between the student and the student, and finally between the instructor and the student. *
- A survey study of two thousand American colleges and universities showed that 3.2 million students studied one subject or more electronically in 2005, while the number was 2.3 millions a year ago. In the same study, 62 % of the senior academics stated that the results of online education were of the same quality of face to face education if not better. 57 % of them re-affirmed that online education was an indispensable part of their long term strategy. **
- The American Ministry of Education has recently announced (in 7/2009) the findings of an analytical study and review of about 1100 studies pertaining to online education post the secondary stage and K-12 students, according to objective measurement standards of learning. Despite the fact that the findings were dissimilar, they tended to prefer online and blended learning which

* Kanwar, Asha and Sir John Daniel, ---" Quality in Distance Education", a paper presented at a meeting of Private Universities, Puna, India (2008)

** *BizEd.* (2007) "*More Students Choosing On Line Ed*" Volume 6, Issue 2:59

prompted the Minister of Education to say, "This report emphasizes the necessity that efficient instructors include the digital content in their lectures, and that they take into account using open source learning management systems which have been proven to be of economic feasibility at schools and university colleges throughout the United States. He added, "We have to avail ourselves of this historic opportunity to manipulate the financial resources which were predestined by the American decree relating to economic convalescence, and to regain investment to provide the citizens with the necessary pace and potential, from the Bandwidth and eventually the online education. ***

- A survey on American universities in 2003, showed that 81 % of all American higher education institutions offer no less than one electronic or blended subject, and that 24 % of them offer complete online programmes that lead to obtaining academic degrees, and that 97 % of the government/ public universities and institutions, all feel the soaring effects of compatibility between society's happiness on one hand and expenditure on learning on the other hand offer no less than one subject electronically, and 49 % of them offer no less than a complete programme electronically.

***[http://thejournal.com/Articles/2009/07/01/Meta-Analysis-Is-Blended-](http://thejournal.com/Articles/2009/07/01/Meta-Analysis-Is-Blended-Learning-Most...)

Learning-Most...

* Allen, I. Elaine and Seaman J. *Sizing the Opportunity: the Quality and Extent of Online Education in the United States, 2002 and 2003*, the Sloan Consortium.

3.4 Selected main Online Education universities in the USA **

There are 177 accredited colleges and universities in online education in the USA. Some of them are:

1. Arizona State University
2. Boston University
3. Brandeis University
4. Colorado Technological University
5. Indian Public University
6. New Jersey Technological Institute
7. New York University
8. Ohio University
9. Philadelphia University
10. Rutgers College of Business Administration
11. Syracuse University
12. George Washington
13. Cincinnati University
14. Florida University
15. University of Illinois at Chicago
16. Maryland University
17. Phoenix University
18. Wisconsin-Superior University
19. Vanderbilt University

** <http://e.learners.com/colleges/colleges.asp>

3.5 Selected World Open Universities

3.5.1 The National University of Korea

It was established in 1972, and it graduated 300.000 students. The number of its students is 200.000.

3.5.2 Payame Noor University in Iran

It was established in 1987. With 431.480 students enrolled, it offers 59 programmes leading to university degrees. It has 257 offices throughout the country.

3.5.3 Anadolu University in Turkey

Anadolu University was created in 1982 from the union of four existing higher education institutes: the Academy of Economics and Commerical Sciences, the State Academy of Architecture and Engineering, the Institute of Education, and a medical school. It runs 88 centers in various regions in the country. And it is the national provider of online education according to a special decree issued in 1981. In 1982/1983 it had thirty thousand students, but in 2005/2006 student enrollment mounted to 87.000.

3.5.4 The British Open University

* The idea of this university goes back to the support by Harold Wilson who appointed Jennie Lee as the Minister of Arts in 1964 and entrusted this project to her.

* It was established in 1969 and the first students enrolled in 1971. Student enrollment in that year was 25 thousands.

* Student enrollment in 2006/2007 mounted to (224.276).

* It has eight thousand associate lecturers in addition to (1218) academics, (1654) assistant academics, and (1847) administrators, technicians and secretaries.

* Teaching and learning process is conducted through printed and audio materials, internet, CD software and digital TV programmes.

* The university has five hundred researchers and (1200) research students in 25 research areas. And it spends 20 million sterling pounds on research and development per year.

* It ranked 280th among the world universities in research and development and surpassed the following universities according to Webometrics Ranking of R&D, 2008:-

Manchester	291
London School of Economics	296
Kings College, London	327
Liverpool	350
William and Mary	352

- It ranked 5th among the British universities in the field of teaching according to the Sunday Times Universities Guide, 2004.
- It surpassed Oxford, Cambridge, universities and Imperial College in the quality of instruction in the field of general engineering according to the UK evaluation standards.
- There is no university in the UK that does not use the open university materials.
- The University's success refers to : excellence in scholarship, in teaching, in research, and above all, in the systems which help people to learn and succeed.

The British senator Iain Macleod described the idea of the British Open University in 1969 as "blithering non-sense".

3.5.5 Indira Gandhi National Open University

It was established in 1985. Student enrollment is 1.5 million students in India and 35 other countries through 1400 offices in India and 41 offices outside India.

Teaching is conducted through a multi-media learning system comprising print, audio, video, radio counseling, internet based learning, and face counseling. It offers (38) different programmes leading to Ph.D. degrees in various specializations, (43) Master's degree programmes, and (30) Bachelor's degree programmes.

3.5.6 Harvard University Extension School

It offers online programmes leading to the Master's degree in (29) diverse fields such as arts, sciences, business-administration, education, religion, government, legal studies, design, and administration. It offers (80) courses for the Spring Term 2010 and likewise for the current First Term 2009.

4. Open Course Ware

4.1 MIT Open Course Ware

MIT Open Course Ware project was established by the honorary president of Massachusetts Institute of Technology, assisted by the William and Flora Hewlett Foundation, and the Andrew W. Mellon Foundation.

MIT places the constituents of all courses offered such as lectures, written and recorded audio and visual materials, examinations and answers on the internet. These are accessible and usable free of charge. It is noteworthy mentioning that:

- The cost of each course is (10-15) thousand dollars and courses that incorporate communication through video conferencing cost double.
- The constituents of MIT Open Course Ware are used by educational parties.

4.1.1 Use scenario and percentage

MIT OpenCourseWare is being successfully used for a wide range of purposes.

USE SCENARIO		% OF USE
Educators	Improve personal knowledge	31%
	Learn new teaching methods	23%
	Incorporate OCW materials into a course	20%
	Find reference material for my students	15%
	Develop curriculum for my department or school	8%
Students	Enhance personal knowledge	46%
	Complement a current course	34%
	Plan a course of study	16%

USE SCENARIO		% OF USE
Self Learners	Explore areas outside my professional field	40%
	Review basic concepts in my professional field	18%
	Prepare for future course of study	18%
	Keep current with developments in my field	17%
	Complete a work-related project or task	4%

These statistics show that 80 % of the site visitors said that it had a very positive influence, and 96 % of the educationalists and academics said that it helped and will help them very much in improving and developing their courses.

The following table gives more details about this site.

Shiple D 1995 transforming community colleges using a learning outcomes approach electronic database

<http://ocw.mit.edu/about/site-statistics/>

4.1.2 Comparison between 2005 Report and 2009 Report

	Year 2005 *	Year 2009 **
Number of site visits in millions	8.5	86.8
Number of courses translated to other languages	350	791
Mirror Sites	70	220
Number of universities that put their course materials on the internet	50 + (30 under processing)	100 + (150 under processing)
Number of courses on the internet	2000 (667 of them are from MIT)	13000 (1950 of them are from MIT)
Course specializations	Electrical engineering, computer science, mathematics, administration, physics, economics, and mechanical engineering courses constitute 33 % of all courses, and they are visited by 62 % of the site visitors	
Parties that enter the site and benefit from the offered courses	61 % from outside USA (East Asia 22 %, Western Europe 15 % , South Asia 6 %, Latin America 5 %, other regions 13 %)	54 % from outside USA (East Asia 17 %, Western Europe 11 % , South Asia 9 %, Latin America 4 %, other regions 13 %)

*http://ocw.mit.edu/ans_7870/global/05_Eval_Summary.pdf

** http://ocw.mit.edu/ans_7870/global/09_Eval_Summary.pdf

4.2 Open Course Ware Specializations at MIT*

- Biological Engineering
- Chemical Engineering
- Civil Engineering and Environment Engineering
- Mechanical Engineering
- Music and Theatre
- Nuclear Sciences

http://ocw.mit.edu/OcwWeb/courses/courses_index.htm

4.3 Emergence of other open programmes, materials and media in America and some world countries*

4.3.1 China Open Resources for Education Project

China created a similar project called China Open Resources for Education through which MIT project materials were translated to Mandarin Chinese, the formal language in China. (In addition, 840 universities in Spanish speaking countries established a union to translate MIT OCW to Spanish.)

4.3.2 Dspace at MIT

* Another project called Dspace was created to put all MIT scientific research production within the reach of others such as MIT OCW, in collaboration with Hewlett-Packard Company.

4.3.3 The Public Library of Sciences Project (PLOS)

The public Library of Sciences project was initiated in 2000 as an initiative of:

- Harold Varmus, President of the Memorial Sloan-Kettering Cancer Center
- Patrick Brown, Stanford School of Medicine
- Michael Elisen, UC Berkeley

as an Open Access Journal to be issued in the fields of life sciences, medicine, computer sciences, genetics and pathogens.

* Vest, Charles M. (2006) "Open Content and the Emerging Global Meta University" in *EDUCAUSE Review*, vol.41, no.3 (May/June) 2006:18-30

4.3.4 Microsoft Research in Collaboration with MIT

MIT in collaboration with Microsoft Research created the E-Lab to enable MIT students to operate experiment appliances and equipment from their bedrooms according to the saying that runs: If you were unable to go to the lab, it would come to you. It has been used in UK, Sweden, Greece, Singapore and Taiwan.

A Student can operate very expensive experiment appliances and equipment available at MIT from any part of the world (or others).

4.3.5 Mirror Sites Project

Due to the fact that making good use of internet services requires a wide band of electromagnetic frequencies (known as Broadband) on one hand, and the fact that many underdeveloping countries are unable to bridge the digital barrier because of its high financial cost on the other hand, MIT put 76 mirror sites on local colleges and universities networks throughout all underdeveloping countries, their number became (220) in 2009.

Benefiting from these sites by the Jordanian universities would contribute to putting them in an advanced position on the world map of university education, science and technology, and would enable them to assume a noticeable, effective and positive role in allowing faculty members and students wherever they are to become familiar with the outputs of knowledge world, make good use of them and promote them as expressed by Professor Charles M. Vest of Massachusetts Institute of Technology: _
" (It) will give teachers and learners everywhere the ability to access and share teaching materials, scholarly publications, scientific works in progress, teleportation of experiments, and world wide collaborations, thereby achieving economic efficiencies and raising the quality of education through a noble and global endeavor".

Vest Charls M (2006) "Open Content and the Emerging Global Meta-University", EDUCAUSE Review, vol 41 no. 3 (May/June 2006):18:30

5. Blended Learning

5.1 Introduction

- In 2004, Professor Jim Taylor, Deputy Vice Chancellor of the University of Southern Queensland (USQ), one of the most innovative dual mode universities in Australia, went even further in posing the question, “Will universities become extinct in the networked world? (Taylor, 2004) He argued that the present traditional approaches based on conventional classroom teaching and learning and a hierarchical, bureaucratic academic structure would not be capable of meeting the escalating demand for higher education in the knowledge society, and that universities must therefore adapt or face the fate of the dinosaurs.*
- Blended learning is a pattern of teaching and learning that is characterized by using various techniques through the internet and/or the computer in addition to face to face meetings, and it combines the advantages of these two techniques as it preserves the traditional learning techniques to which students are accustomed and it is supported by online education which observes individual differences in learning methods and knowledge accumulation.

* Hope, Andrea (2006) "Factors for Success in Dual Mode Institutions"
(col.org/SiteCollectionDocuments/06_Dualmodeinstitutions.pdf)

5.2 Reasons for the prevalence of Blended Education

- It motivates social communication among students themselves, students and teachers, and teachers themselves.
- It allows students the opportunity to fulfill the requirements of online courses at students' pace, capacities and circumstances at any time and place.
- It enhances students' ability to work in small groups and in a team spirit, to review issues and find out their solutions, and it focuses on self-dependence on one side, and dealing with others on the other side.
- It provides quality and excellent teaching materials, and objective evaluation, review and development methods that ensure attainment of programme outcomes and focus on all teaching and learning skills.

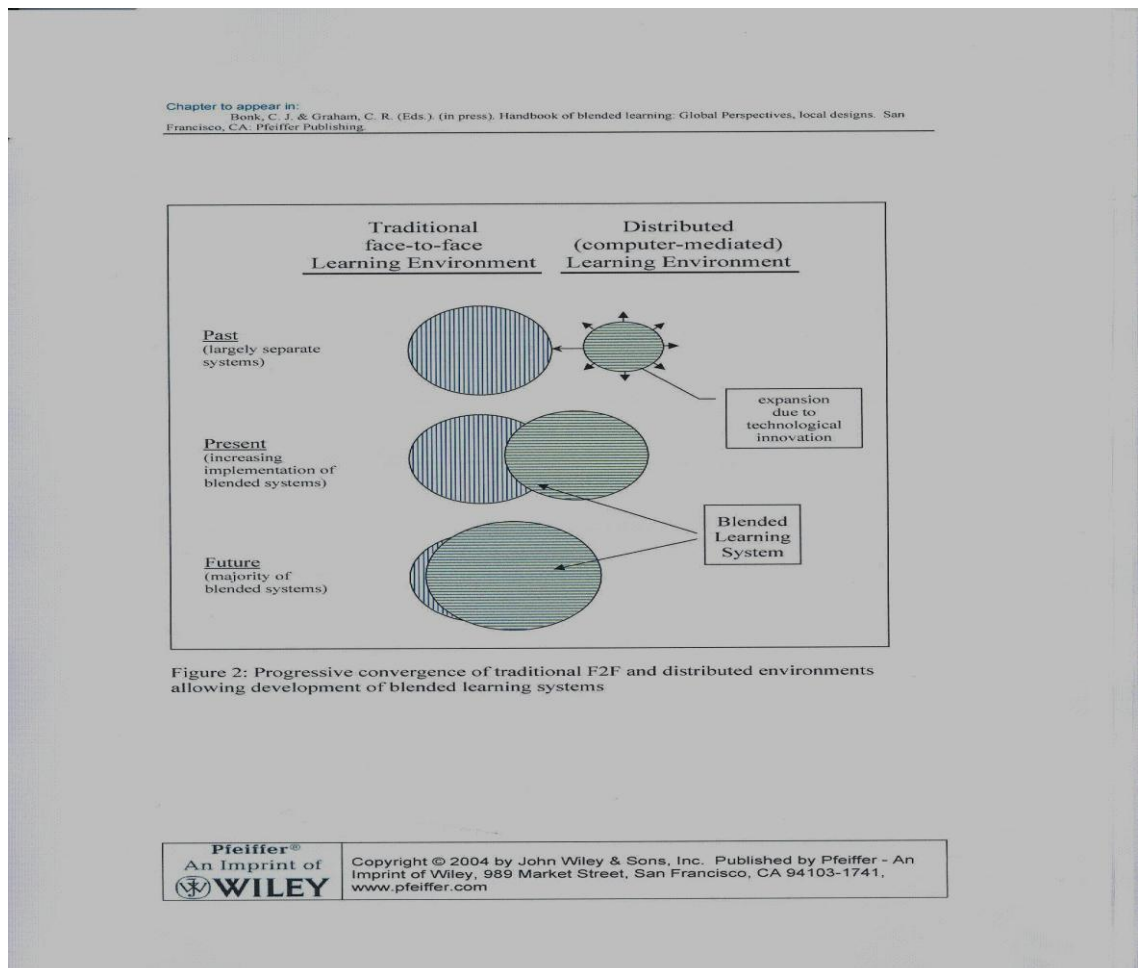
5.3 Blended Education requirements

- Experts in curricula planning, preparation and developments.
- An advanced technological structure particularly in respect of what is known as "Bandwidth" to be used to measure the average of information communication through the internet. It is usually used to identify the potentials available for the individual to receive information and transmit it through satellites, Fiber Optics networks.....etc. This bandwidth is used for all media in spite of the fact that speed differs for each.
- Academically and professionally qualified academic staff members specially in using technology in the teaching learning process through advanced modern media.

5.4 Internet penetration speed

- Internet recall speed, transmission and reception, in USA, Canada, Singapore, UK and Japan, is one billion kilobits per second or more, but it does not exceed 1024 kilobits per second in the Arab World.
- The individual's share of the communication band through the internet by bits per second is as follows:

Jordan (5795), Qatar (953), UAE (923) according to the World Bank Database Knowledge Assessment (Methodology /KAM), June 2009.



5.5 Blended Education economies / a hypothetical example

* The Cost of teaching 27 credit hours, i.e.(9) university required courses to eight thousand new students at a public or private university, face to face on one side, and according to blended education on another.

5.5.1 Standpoints and Assumpoints

A. The number of the offered sections is computed by dividing the total number of students by (40) in face to face learning and by (25) in blended learning.

B. An academic staff member is given four sections in face to face learning and eight sections in blended learning. The need for academic staff members is worked out by dividing the total number of sections by double the amount of sections to be taught by a faculty member in one semester

C. Teaching Cost = The number of the academic staff by the total annual salary of the academic staff.

D. The number of face to face meetings in blended learning is (12), out of (48) class hours allocated to the course, (3) credit hours.

5.5.2 Traditional / Face to Face education scenario

A. $8000/40 \times 9 = 1800$ sections distributed across 1st and 2nd semesters

B. $1800/8 = 225$ academic staff members

C. $225 \times 12000 = \text{J.D. } 270000$

5.5.3 Blended Education Scenario

$8000/25 \times 9 = 2880$ sections

$2880/16 = 180$ academic staff members

$180 \times 12000 = \text{J.D } 2160000$

Saving = 540000 Jordanian Dinars.

This is an addition to the possibility of increasing the capacity of the classrooms and other university utilities which would enable the

university theoretically to double the number of the students. We notice the following: _

- The total number of students taught by the faculty member in face to face education = 160
- The total number of students taught by the faculty member in blended education = 200
- The number of meetings according to face to face learning = 160 hours, 50 minutes each (40 X4)
- The number of meetings according to blended learning = 96 hours (8 X 12)

- The cost of conducting blended education in respect of specialization courses and other required courses in so much as (108) credit hours to all admitted students to the Jordanian universities in so much as (44200) students would be as follows:_

Traditional Education:

- A. $44200 / 35 \times 12 * = 15154$ sections
- B. $15154 / 6 ** = 2525$ academic staff members
- C. $2525 \times 18000 = 45450000$ Jordanian Dinars

** Current and Future Trends in Higher Education, P.9 (A study by Hof Wittenberg commissioned by the Austrian Federal Ministry of Education, Science and Culture)*

Blended Education :

A. $4400 / 25 \times 12 = 21216$ sections

B. $21216 / 16 = 1326$ academic staff members

C. $1326 \times 18000 = 23868000$ Jordanian Dinars

Savings = 21582000 Jordanian Dinars

This is computed on an annual basis, but the savings in four years would be as follows:

- University required courses year in so much as (27) credit hours = 2.98 million Jordanian Dinars
- Three years of specialization in so much as (108) credit hours = 64746000 Jordanian Dinars

Total = 67726000 Jordanian Dinars.

6. Suggestions for the development of higher education

* Reconsidering the quality of education, the number of the subjects, students study, and the required credit hours for obtaining academic degrees.

* Maintaining a balance between applied sciences and social sciences, between teaching and training, between theory and application, between academic research and instruction, between academic freedom and social accountability, between education for education and learning for work, between imitation and innovation, between autonomy and surveillance, and between education for all and education for the elite. *

* Arabicization of education as a first and contributory step towards its globalization in a limited framework stemming from Jordan's needs, aspirations and strategies to formulate knowledge society.

* Defining a general description of the university graduate including:

- Ability to analyze and perceive correlations, and find suitable solutions for the cases and problems that face him/her.
- Ability to communicate with others.
- Ability to adapt to the latest developments.
- Ability to learn constantly and have access to information sources.
- Ability to take the initiative, plan, organize and evaluate.
- Ability to work in a team spirit.

* Adopting the blended/ hybrid education method for its favorable impact on the quality of instruction and teaching and learning economies.

* Defining the outputs of each educational programme leading to academic certificates so that they may be on the level of the country not the university, provided that it be like a contract between universities and

* *Current and Future Trends in Higher Education, p.9 (A study by Hof Wittenberg commissioned by the Austrian Federal Ministry of Education, Science and Culture.*

students commensurate with what is applicable in the developing world and American, British and Canadian quality control institutions and organizations and according to academic programmes and certificates compatibility proceedings in the Bologna Process* which is currently incorporating (46) European countries, with the aim of creating a European educational zone through: reaching the highest possible degree of harmony and integration among the educational programmes offered by (5600) European universities representing 25 % of the world universities which have (31) million students.

* Harmony between the number of administrators and faculty staff and attaining a ratio similar to that in the advanced world universities which is 1:1 not about three administrators to each faculty staff member.

* Considering the possibility of deciding a formula for the programmes cost that matches the professions graduates hold which may entail raising the fees of engineering, medicine, pharmacyetc. specializations.

* Abolishing what is known as the parallel education programme without any prejudice to the rights of students who are not financially well-off as the blended education programmes allow increasing the number of admitted students consequently decreasing their cost which would be reflected on students, and they observe the principle of equal opportunities instead of contributing to making learning limited to a financially well-off minority and eventually would contribute to the retreat of learning democracy and democracy in general.

* *Bologna Day 2008: A Summary of Proceedings*

* Allocating no less than two thousand scholarships to qualify two thousand faculty members, and maintaining a list of high caliber universities to which scholarship holders can be dispatched to effect the desired quality transition.

It may be useful to state that the number and distribution of the students sent by China and India to study abroad were as follows in 2004:

- The number of students sent by China to study abroad was 349506, 76 % of them joined universities in the countries shown in the table.
- The number of students sent by India to study abroad was 123559, 94 % of them joined universities in the countries shown in the table.**

Students' distribution across the countries where they study was as follows:

Dispatching Country	Destination Country				
China					
USA	Japan	UK	Australia	Germany	
87943	76130	47738	28309	25284	
India					
USA	Australia	UK	Germany	Newzealand	
79736	15742	14625	4237	1345	

70 % of them joined graduate studies.

* Working diligently to communicate, interact and integrate with commerce and businessmen sector concerning the production of science

** *Kapur and Crowley 2008, P.22*

and technology. Statistics show that this sector constituted 83.8 % of the patents submitted to Patent Cooperation Treaty (PCT) Corporation for the year 2008 despite their variation from one country to another as shown below*:

- Sweden	94.2
- Japan	93.6
- USA	83.3
- UK	79.6
- Israel	72.5
- India	69.6
- China	68.6
- Spain	51.1
- Singapore	45.2
- Brazil	45.1
- South Africa	40.9

* Bridging the gap between secondary education outputs and university education inputs.

* Optimal usage of the resources and their distribution across duties and works.

* Reconsidering the procedures for the appointment of academic staff, their training, evaluation of their performance, their financial and incorporeal remunerations according to objective, transparent and enunciated criteria.

* Working hard so that university education intake reaches 50% of the students who sit for the general secondary education certificate exam. This is the target percentage of the European countries joining Bologna Process.

* *World Intellectual Property Indicators, 2009*

- * Putting all constituents of the subjects taught by the academic staff members on a special accessible website so that their counterparts at other universities may benefit from them.
- * Universities and higher education institutions should join OCW consortium which has been stated before.
- * Establishing a Jordanian open university or an extended learning programme at one university or more, similar to Harvard university program, to identify the extent of blended learning effectiveness in terms of the quality of learning and its economies.
- * Instilling the culture of donation to universities through endowments similar to what exists in the American, European and other universities. This can be realized through public and non-profitable private universities (if any) and through transparency in the investment of these endowments in the areas for which they have been allocated.
- * Adopting a road map for teaching and learning based on defining the final outputs of the university certificate holder, and on the outputs of every course in the programme, each unit of the course, each lecture of the unit. The characteristic of outcomes-based curriculum design and implementation, compared with traditional education, are as follows:

The following table indicates the fundamental shifts that must occur in order for a traditional program or course to become outcomes-based. It also reveals the advantages of an outcomes-based program design.

Program Design or Course Design

Traditional	OBE
Inputs are important. Time-based; courses are specified by time and subject with number of hours per week/term.	Results are important. Outcomes based; courses are linked to outcomes and imply flexible use of time, resources, and space.
Learners are grouped in classes and move through the courses/subjects together.	Learners advance through the courses in various ways to achieve outcomes.
Subjects and sections are assigned to teachers who prepare and teach classes and evaluate learners.	Teachers are responsible for a set of outcomes related to a course or program.
Learners accumulate courses and grades over a set number of terms which eventually lead to a credential.	Learners demonstrate achievement of outcomes over time and according to their own abilities.

Teaching Roles

Faculty prepare, teach, evaluate with respect to their own subjects/courses (learners learn what is taught).	Teachers design, plan, instruct, facilitate, demonstrate, assess, evaluate related to a set of predetermined, community based outcomes.
Teachers stand and deliver in class; are seen as repositories of information which they disseminate.	Teachers advise, consult, coach, facilitate, provide resources, demonstrate, and instruct.
Most teacher-student "contact" is classroom-based.	Teacher-learner "contact" may be based on the number of learners a teacher as member of a teaching team has responsibility for.
Teachers provide teaching and usually work autonomously.	Teachers facilitate learning and usually work as members of teaching teams.

* Shipley, D. (1995) *Transforming Community Colleges Using A Learning Outcomes Approach*. (Electronic Database: ERIC # 388346).