Technology Based Learning Analysis of CBCS Model at KKU

Case Study of College of Computer Science King Khalid University, Saudi Arabia

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***Abstract*—The higher education frame works are attempted to develop the human capital of the country thinking of the next generation technology. The Kingdom of Saudi Arabia is prioritized the higher education sector is one among the segment in current scenario. The establishment of new universities and the business schools are evidence that the Kingdom of Saudi Arabia is providing higher education with the Islamic culture and values to build up the upcoming young generation. While providing the higher education model, mostly focused on the four sectors namely Islamic culture and values, basic science for life enhancement, higher education for technology and prepare the potential young youth for employment to buildup the human resource of the country. As part of the national mission and the vision of the country, the educations sectors are distributed the higher education frame work as Choice Based Credit System (CBCS) curriculum into these above stated four sectors. The study is made to analysis the Higher Education frame work of College of Computer Science curriculum, King Khalid University, Abha, Kingdom of Saudi Arabia. It evaluates the learner's suitability potential to meet the enhancement of higher education in the same major subject and Employability in the specified filed with Islamic culture and values.**

***Index Terms*—Choice Based Credit System (CBCS), Higher Education Curriculum KSA, Higher Education Frame work, Islamic Values and Culture**

I. INTRODUCTION

The modern education pedagogy is highly focused to retain and secure the socio culture values for the next generation through reforming technology oriented educational system. The high demands of human values are provided in the education system previously .In modern era; the educational system incorporates the technology and struggle to balance the technology and human social values. In this scenario, the academic people and wise personalities are viewed that educational system is the only process to build the technology based human value system. Keeping this ideology, the Kingdom of Saudi Arabia educational system is viewed and analyzed in this work. The case study of King Khalid University, College of Computer Science curriculum adopted for evaluation and analysis to prove technology based human value transformation process in the higher education system of KSA. The few highlights of Higher Education system is presented below as part of the introduction.

The Ministry of Higher education focused on contemporary Saudi society, in culture, economy, technology and daily life-style, necessitate parallel educational change. The 20th century witnessed the resurgence of learning and the sciences in many Islamic countries. Education has been one of the first and most prominent benefits accompanying the development of the modern society. Saudi Arabia devoted special attention to foster higher education. The objectives are established in 1975, the Ministry of Higher Education embarked on a long-term master plan to enable the Saudi educational system to provide the highly trained manpower necessary to run the country's increasingly sophisticated economy.

UNESCO directed the Ministry of Education (2004-2014) into "Engendering a new generation of male and female youth who embody the Islamic values in their persons, both theoretical as well as practical, are equipped with necessary knowledge, skills, and endowed with the right orientations, capable of responding positively to, and interact with the latest developments, and deal with the latest technological innovations with ease and comfort. They should be able to face international competition both at the scientific as well as technological levels to be able to meaningfully participate in overall growth and development. This is to be achieved through an effective and practical system of education which is capable of discovering the potentials and predispositions, and, create the spirit of action. All this, in an environment of education and training, charged with the spirit of instruction and edification"[1].

The Kingdom is trying to provide education for next generation on technological basis with the above mentioned vision. Nolan [2] stated that higher education reform for Saudi Arabia with its religious, political, and regional stakeholders is perhaps the most difficult among the GCC countries due to its accelerated pace of development, deep religious traditions, and the complex political dynamics of the Kingdom. The challenges of the providing value based education are achieved in the current higher education curriculum maintaining socio culture value of the Islam. Kingdom of Saudi Arabia higher educational system is integrated with social science and physical science to provide technical education. The education system provides the culture values to use the modern technology for the sustainable empower of human values. This paper is an attempt to analyze the current education system model and the distributed weight of the sustainable approach based on *Choice Based Credit System (CBCS)* model [3]. It provides the technology based education to the current and upcoming leaner's to build up the nation to face the next century.

II. SCOPE AND OBJECTIVE

The traditional education system aims to provide the socio cultural values to the next generation. In KSA, international community is involved in the development of higher education system to the building process of next generation in a sustainable manner. The cultural values of Islam and the integration of technological development is attempted to balance in the Higher education framework. This paper is aimed to study the *Choice Based Credit System (CBCS)* model and the rapid growth of Saudi Educational Systems frame work on Islamic Culture values, basic science for life style, adaptation of Technology for Higher education and employability in their university curriculum. However, the weightage given by the each segment is analyzed with the priority and the option for enhancement.

III. BACKGROUND OF STUDY

The Saudi education transfer the value based educational approach since *maktab* (small local schools) and *madrasahs* (places of learning) educational system. The Prophet Mohammad (Peace be Upon Him) united the Peninsula and established a seat of learning in Makkah in the seventh century, CE. Since then, learning took place in maktabs described first by Ibn Sina in the eleventh century, and madrasahs heled in mosques to study the Quran [4]. Different types of educational institutes became available free of cost to all Saudis after the formation of Kingdom in 1932. The Saudi education revolution is summarized as a table-1 below

TABLE I.
EDUCATIONAL DEVELOPMENT IN KSA

Year	Educational Reformation	Source
1932	Small educational program comprising 12 schools with 700 students	[5]
1953	Ministry of Education was established	[6]
1957	First University was established i.e. King Saud University with nine lecturers and 21 students	[7]
1975	Ministry of Higher Education was established to manage seven universities	[7]
2004-2010	Public universities has increased significantly from eight universities in 2004 to 24 universities in 2010	[8]

The Ministry of Higher Education is a centralized authority responsible for directing university education in accordance with the adopted policy, supervising the development of university education in all sectors, coordinating among universities especially in the field of scientific departments and degrees, encouraging research, and formulating rules and regulations for compliance by all institutions of higher learning.

The population in Saudi Arabia is growing rapidly, and over 60 per cent are under the age of 25 years. The number of public universities has increased significantly from eight universities in 2004 to 24 universities in 2010.In the education reformation, King Khalid University was born to strengthen the Education system in the Asser region of south west of Kingdom.

A. King Khalid Univesity

King Khalid University (KKU) is a public university established in 1998 by merging King Saud University and Imam Muhammad Ibn Saud Islamic University in the Asser Province of South-West Saudi Arabia with the below vision and mission.

a) Vision: King Khalid University strives for a leading role with regional roots, international dimensions, knowledge and research excellence and effective community contribution through qualitative competence

b) Mission: King Khalid University commits to providing relevant academic environments for high-quality education, conducting innovative scientific research), providing constructive community services, and maximizing the employment of knowledge techniques.

King Khalid University has around 70,000 students in 21 different colleges and faculties separate for boys and girls. It is one of the biggest centers of learning portal in the Middle East region with a reputation as a major provider of both continuing and higher education. The university has various colleges to provide Islamic culture and Arabic language, Social Science, Education, Engineering and medical courses. All the courses are aimed to build up the nation with professionals in their respective fields. The university maintained the Islamic culture and value while providing the higher education to the learners in their respective fields. As a case study, the college of computer science degree programs are analyzed and discussed as part of the paper. The analysis methodology for the evaluation of distribution of culture values, basic science and technology transformation is described below.

IV. SCOPE AND OBJECTIVE

The methodology aimed to analysis the offering curriculum frame work to identify the weightage of Islamic culture and values, basic science for the life survivability and technology for social empowerment. The following steps are described:

Step 1: Adopt the offering courses and formalize the courses according to the level and semester

Step 2: Group the offering courses according to the nature of the content and relevant to the identified four segments namely

a) Islamic culture and values
b) Basic Science and Technology Awareness
c) Higher Education courses
d) Employability Courses

Step 3: Classify the courses based on the evaluation of content and segment them in the next level

a) The Islamic culture and value classified into Islamic Culture and Arabic Languages
b) The basic Science classified into Mathematics, physics which belongs to physical science and Introduction to technologies
c) The major subjects are classified into Subject major fundamental and major advanced subjects. The fundamental subjects are providing technology introduction, principles and concepts. The advanced subjects are providing technical applications and possible enhancement

in the fundamental subjects. The advanced courses are mostly buildup with the fundamental subject as a prerequisite.

d) The major subjects are designed to provide employability to the learners as part of the objectives. If the courses are skill oriented then it provides the job market. These subjects are classified under employability courses. The English language skills and technical skill courses are classified under this category.

Step 4: Identify the equivalent teaching hours and the credit for each subject as per the assigned category.

Step 5: Assign the weight for each coursed product of teaching hours and the assigned credit

Step 6: Construct the layer based model for the combination of offering subjects and the obtained sum for suitable category

Step 7: Substitute the secured grade or mark for the leaner and identify the suitability of higher education and the Employability indicator.

The above mentioned seven steps are executed in the college of computer science under graduate curriculum and the obtained intermediate and indicator results are discussed as part of the findings. The data source is described below the discussion of result and findings .

V. SOURCE OF DATA

The Department of Computer Science, College of Computer Science, King Khalid University is identified as a stakeholder of higher education system of Kingdom of Saudi Arabia. The department of Computer science is offering

a) Bachelor of Science in Computer Science(BS CS)
b) Bachelor of Science in Information System(BS IS)
c) Bachelor of Science in Computer Network and Communication (BS CNC)
d) Bachelor of Science in Computer Engineering(BS CE)

The course formwork and the learner's performance sample are collected and processed. The evaluation is focused on the offering courses and structure of the courses. As a sample, the final year transcript is fetched from the registrar of the college and the evaluation is tested. The course credit hours and weight for each course are computed with the proposed steps and the following results are obtained.

VI. COURSE FRAMEWORK ANALYSIS

The colleges of computer science courses are famed on semester base system of ten semesters for the entire adopted curriculum. The courses are having a credit based approach. All the courses are weighted with credit inline to the number of teaching hours and the importance of the subjects as part of curriculum. All the four courses are offering the subjects to fulfill the above discussed four segments namely Islamic culture and values in addition to the Arabic language, the basic science for social applications and the major subject's inline to the offering courses. The major courses are classified as a foundation subjects and advanced subjects related to their higher education program and the subjects related to provide the job opportunity in the industry. The following table -2 shows the classification and distribution of Bachelor of Science in Computer Science as a sample given below. We will use following symbols referred in the rest of paper as

- Sem - semester
- IC -Islamic Culture
- AL - Arabic Language
- MP -Mathematics – Physics.
- BS- Basic Science
- TA - Technology Awareness
- MFS-Major Fundamental Subject
- MAS-Major Advanced Subjects
- EE- English for Employability
- MES - Major Employable Subjects

TABLE II.
DISTRIBUTION OF SUBJECTS

	Culture and Value		Basic Sciences		Higher Education		Employability		Total
Sem	*IC*	*AL*	*MP*	*TA*	*MFS*	*MAS*	*EE*	*MES*	
1	1		1	1			1		4
2	1		1		1		1		4
3	1	1	2		1				5
4	1	1	1	1	2				6
5			1		1	3			5
6			1		2	2			5
7			1		3	1			5
8				1	1	3			5
9						4		1	5
10	1					2		3	6
Total	**5**	**2**	**8**	**3**	**11**	**15**	**2**	**4**	**50**
	7		**11**		**26**		**8**		

In the ten semesters, the learners are famed to learn from 50 subjects. Out of the 50 subjects 7 subjects are belongs to Culture value and Arabic languages. Out of 7 subjects the highest weightage is given to Islamic Culture. There are 11 subjects assigned for the basic Science and technology awareness and the remaining are allotted for the major subjects and employability subjects. In the major subjects are classified with the more or less equal weightage of fundamentals and advanced subjects. The subjects weighted according to the number of credit assigned to the subjects. The credit allotment and the distribution of subjects in the semester and the segments are presented as a table-3.

The same process is carrier over all the four courses of the four departments and the summary is presented below table 4.

The distribution shows that all the departments are offering 5 subjects as an average in each semester to the learners. The percentage of the offering subject for each course is computed and presented table-5.

The departments are offering the minimum of 7.41 percentage of the curriculum in each semester and the maximum of 12.96 % . The first year learning weightage is less because the leaner's are new to the university and under-

stand the system of university. The remaining semesters learning weightage is high. The learners weightage according to number of subjects and the identified segments are calculated and presented table-6.

The distribution of subjects and its weightage is calculated on percentage and presented below table -7.

As per the analysis, the Islamic culture and Arabic Language is taught to the learners in 13% and the basics Science is taught in 17.91 %, 59.4 % is assigned for major courses for Higher Education and the remaining 9.67% is allotted for the employability subjects. The following figure-1 shows the distribution of weightage for department of computer science curriculum according to the identified segments.

The table-7 shows that entire departments are importing the educational system at the higher educational level in the combination of Islamic Culture value along with Arabic languages. The basic science subjects are covered offering mathematics, physics and fundamentals of technology such as introduction to computers, internet etc. The major courses are unique in each major courses but the weightage is similar one with another.

TABLE III.
DISTRIBUTION OF CREDIT HOURS

	Culture and Value		Basic Sciences		Higher Education		Employability		Total
Sem	*IC*	*AL*	*MP*	*TA*	*MFS*	*MAS*	*EE*	*MES*	
1	2		3	3			6		14
2	2		3		3		6		14
3	2	2	7		4				15
4	2	2	3	3	7				17
5			3		4	9			16
6			3		7	6			16
7			3		10	3			16
8				3	3	9			15
9						12	2		14
10	2					6		7	15
Total	**10**	**4**	**25**	**9**	**38**	**45**	**14**	**7**	**152**
	14		**34**		**83**		**21**		

TABLE IV.
LEARNING WEIGHT DISTRIBUTION ACCORDING TO NUMBER OF SUBJECTS

Sem	1	2	3	4	5	6	7	8	9	10	Total
BS CS	4	4	5	6	5	5	5	5	5	6	50
BS IS	4	4	5	6	5	5	5	5	5	6	50
BS CNE	4	4	6	7	6	6	5	5	5	6	54
BS CE	4	4	6	7	6	5	6	6	5	5	54

TABLE V.
LEARNING WEIGHT DISTRIBUTION ACCORDING TO PERCENTAGE OF SUBJECTS

Semester	1	2	3	4	5	6	7	8	9	10
BS CS	8.00	8.00	10.00	12.00	10.00	10.00	10.00	10.00	10.00	12.00
BS IS	8.00	8.00	10.00	12.00	10.00	10.00	10.00	10.00	10.00	12.00
BS CNE	7.41	7.41	11.11	12.96	11.11	11.11	9.26	9.26	9.26	11.11
BS CE	7.41	7.41	11.11	12.96	11.11	9.26	11.11	11.11	9.26	9.26

TABLE VI.
CLASSIFICATION OF OFFERING SUBJECTS

	Culture and Value		Basic Sciences		Higher Education		Employability		Total
Sem	*IC*	*AL*	*MP*	*TA*	*MFS*	*MAS*	*EE*	*MES*	
BS CS	5	2	8	3	11	15	2	4	50
BS IS	5	2	7	3	10	18	2	3	50
BS CNE	5	2	6	2	9	25	3	2	54
BS CE	4	2	6	2	8	28	2	2	54

TABLE VII.
DISTRIBUTION OF SUBJECTS AND ITS WEIGHTAGE

	Culture and Value		Basic Sciences		Higher Education		Employability		Total
Sem	*IC*	*AL*	*MP*	*TA*	*MFS*	*MAS*	*EE*	*MES*	
BS CS	10.0	4.0	16.0	6.0	22.0	30.0	4.0	8.0	100
BS IS	10.0	4.0	14.0	6.0	20.0	36.0	4.0	6.0	100
BS CNE	9.3	3.7	11.1	3.7	16.7	46.3	5.6	3.7	100
BS CE	7.4	3.7	11.1	3.7	14.8	51.9	3.7	3.7	100
Average	9.17	3.85	13.06	4.85	18.37	41.04	4.31	5.35	
Sum	13.02		17.91		59.41		9.667		100

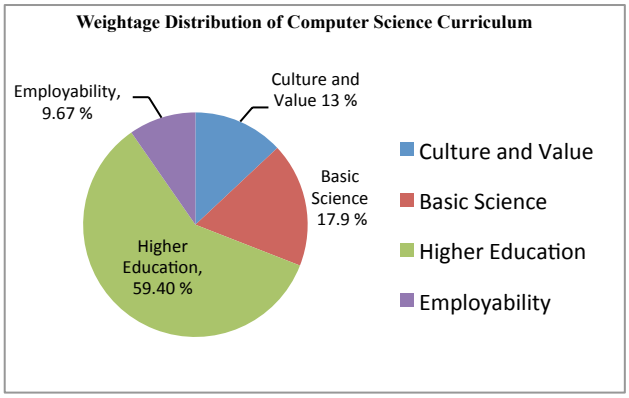

Figure 1. Weightage Distribution of Computer Science Curriculum

VII. FINDINGS AND DISCUSSION

The each course subjects are evaluated to the learner's secured score of the subject which is the combinations of theory and the laboratory program other than language and Basic skill courses. The sample calculation of a student is presented below along with his obtained marks. The table-8 shows that the percentage of framed weightage of the curriculum and secured weightage of the learner's in the analyzed segment.

The student is secured 4250 marks out of 5000 marks in the total learning period of 5 years. The curriculum is designed for above mentioned weightage but he is secured 88.57% on the Islamic culture, 77.73% on the basic science, 87.31 % on the major higher education subjects and 84.17 % on the employment skills.

TABLE VIII.
LEARNERS PERFORMANCE ACCORDING TO THE SECURED SCORE

	Culture and Value		Basic Sciences		Higher Education		Employability		Total
Sem	*IC*	*AL*	*MP*	*TA*	*MFS*	*MAS*	*EE*	*MES*	
1	90		80	75			85		330
2	90		75		80		80		325
3	95	85	120		80				380
4	90	85	75	80	150				480
5			75		80	270			425
6			90		175	180			445
7			90	95	265	90			540
8					90	265			355
9						355		70	425
10	85					190		270	545
	450	170	605	250	920	1350	165	340	4250
SUM	**620**		**855**		**2270**		**505**		
Obtained	11.53		13.92		51.87		8.14		85.45
Designed	13.02		17.91		59.41		9.67		
% of fulfillment	88.57		77.73		87.31		84.17		

The suitability analysis process, Islamic culture and Basic science are consider 25 % weight and the major higher education and the employability consider for 50 % with the below calculation is executed in equation (1) and equation (2).

Suitability for Higher Education =

$(((88.57 + 77.73)/2) + 87.31)/2 = 85.23\ \%$ (1)

Suitability for Employability =

$(((88.57 + 77.73)/2) + 84.17)/2 = 83.67\ \%$ (2)

As per the obtained suitability value he is eligible for both employability and higher education but according to the highest score he is recommended for higher educations.

VIII. CONCLUSION

This paper analyzed the higher education framework of kingdom of Saudi Arabia. The courses are designed to provide the technology learning program with the Islamic Culture and values. All the designed and implementing curriculums are balanced with the objectives of national vision. The current curriculums are highly designed to motivate the students to continue their higher education, therefore more than 50 % of the curriculum covered on the major courses. The education system adopted the technology tools as part of importing higher education to the learners. The further research works continue to evaluate the usage of technology tools such as E-Learning and Computer Aided teaching at the Higher Education of Kingdom of Saudi Arabia.

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REFERENCES

[1] World Data on Education. 7th edition, 2010/11, Saudi Arabia Chapter, Compiled by UNESCO-IBE. Available at http://www.ibe.unesco.org/fileadmin/userupload/Publications/WDE/2010/pdf-versions/Kyrgyzstan.pdf

[2] Nolan, L. E. (2011, 16 March). Keeping the kingdom: the politics of higher education reform in Saudi Arabia, Paper presented at the annual meeting of the International Studies Association Annual Conference: global governance: political authority in transition, Montreal, Quebec.

[3] Clementking, Mohamed Sulaiman, Study on CBCS : A Neural Network Model, International Journal of Computer Science and Applications,2010, ISSN 0974-0767 PP 202-205

[4] Asimov, M., & Bosworth, C. (Eds.) (1998). History of civilizations of central Asia, vol. IV: the age of achievement: AD 750 to the end of the fifteenth century. Part 1: the historical, social and economic setting. New Delhi, India: Motilal Banarsidass Publishers for UNESCO.

[5] Simmons, C., & Simmons, C. (1994). English, Israeli-Arab and Saudi Arabian adolescent values. *Educational Studies*, 20(1), 69-87. http://dx.doi.org/10.1080/0305569940200106

[6] Hamad I. Al Salloum, Saudi Arabian Cultural Mission to the United States, *Education in Saudi Arabia* (Beltsville, MD: Amana Publications, 1995), 2nd edition, pp. 7-8.

[7] Alebaikan, R. (2010). *Perceptions of blended learning in Saudi universities*. PhD thesis, University of Exeter, Exeter, England. KSA.(2012)

[8] Saudi Arabian Cultural Mission to Washington DC,(2011), http://www.sacm.org/Publications/58285_Edu_complete.pdf

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