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Assessing Employability skills in curriculum of Chemical Engineering Programs

Dr.Muhammad Usman Awan

Assistant Professor

IQTM, University of the Punjab, Pakistan

CONTENTS

- Background of the study
- Outcome Based Education
- Employability Skills (ES)
- Methodology
- Results
- Assessing missing core employability skills in curriculum
- Missing employability skills in curriculum
- Conclusion of the study

BACKGROUND OF THE STUDY

- Globalization
- Competent Manpower
- Unemployment
- Role of Higher education commission-Outcome based education
- Imparting competent employability skills
- Improving Productivity of organization
- Boosting Country's Economy

OUTCOME BASED EDUCATION

Outcome Based Education is a *management philosophy* by which institutions have to *focus and organize everything* that possibly results of the *learning of students* (WG & Spady, 1994).

STEP by STEP Approach:

1)Need of essential competent skills→ **2)**Organize in curriculum→ **3)**Integrating pedagogy of teaching→ **4)**Assessing improved competence level of skills in students for continual improvement

OUTCOME BASED EDUCATION cond..

According to WG & Spady definition, there are two approaches to outcome based education:

- Traditional Outcome Based Education→ Imparting subject related skills/Bookish knowledge
- Transitional Outcome Based Education → Imparting cross discipline skills/ Soft skills/Employability skills

NOTE: Most successful outcome of educational institutions is the employment of their graduates-more or less *Bookish Knowledge* remains same but competitive edge would come imparting *Employability Skills* in particular subject curriculum.

EMPLOYABILITY SKILLS

A set of attributes and skills that make graduates more likely to gain employment and be successful in their chosen occupations, which benefit themselves, the workforce, the community and the economy is called *employability skills* **(Yorke, 2006).**

First time the term used by Secretary's Commission on Achieving Necessary Skills (SCANS, 1991) for Americans Workforce to boost up competence level for enjoying productive, full and satisfying lives.

METHODOLOGY

Comparison among Current Competence Level (CCL) employability skills vs. Expected Competence Level (ECL) employability skills.

CCL Employability Skills

These are competence level of skills which students and graduates currently have in them.

ECL Employability Skills

These are the skills which HR managers looks in students.

Competent Employability Skills for chemical engineers would be selected using Focus Group Discussion (FGD) Approach discussed by Morgan in 1993.

METHODOLOGY (contd..)

Focus Group Discussion Approach:

1)Selecting Questionnaire→ **2)**Adding or Removing construct and items for integrating questionnaire with new population→ **3)**Subject Specialist Review→ **4)**Peer's Review→ **5)**Finalize questionnaire for new population

SAMPLING:

Quantitative Sampling Technique *was used to collect Data from respondents*

- ***CCL EMPLOYABILITY SKILLS DATA*** was collected manually-meeting students, graduates and teachers of 5 educational institutions imparting chemical engineering
- ***ECL EMPLOYABILITY SKILLS DATA*** was collected by using Google docs from 100 human resource managers of 86 chemical organizations belongs to Petrochemical, Fertilizer and General sector of Pakistan.

METHODOLOGY (contd..)

FINALIZATION OF CONSTRUCTS AND THEIR ITEMS AFTER FGD APPROACH

1.	**Management Skills**	**(MS)**	**(4 Items)**
2.	**Leadership Skills**	**(LS)**	**(6 Items)**
3.	**Interpersonal Skills**	**(IS)**	**(4 Items)**
4.	**Critical Thinking Skills**	**(CTS)**	**(6 Items)**
5.	**Numeracy &Communication Skills**	**(NCS)**	**(3 Items)**
6.	**Technological Skills**	**(TS)**	**(3 Items)**
7.	**Work Ethic Skills**	**(WES)**	**(3 items)**

Reliability test of Cronbach's Alpha and **Mean Results** were used to analyse the gap of CCL vs. ECL employability skills using SPSS and Microsoft Excel for prioritization of data.

RESULTS

Likert Scale showing the degree of Employability skills requirement:

1=Strongly Agree, **2**=Partially Agree, **3**=Agree, **4**=Partially Disagree and **5**=Disagree

Mean Statistics Results of Management Skill

- CCL Management skills (MS) of Student = 2.268
- CCL Management Skills (MS) of Graduates = 1.960
- ECL Management skills (MS) of HR Manager = 1.375

HR Managers expect to have more Management Skills in students and graduates as compared to current level of employability skills they have been imparted by Educational Institutions in them.

AND

Prioritization of skills after mean statistical results are in the order:

WES > MS > NCS > CTS > LS > IS > TS

ASSESSING MISSING CORE EMPLOYABILITY SKILLS IN CURRICULUM

Assessing core employability skills in higher education commission proposed chemical engineering curriculum was progressed using steps:

STEPS TO FOLLOW:

1. Proposed HEC curriculum have subjects with detailed objectives/learning outcome
2. Subjects imparting traditional knowledge and transitional knowledge will be separated
3. All the transitional skills separated from curriculum in 2nd step would be matched with the transitional skills present in questionnaire. Arrange all with their categories
4. The transitional skills in questionnaire which would be empty or having no category is not present in curriculum

ASSESSING MISSING CORE EMPLOYABILITY SKILLS IN CURRICULUM (contd..)

- Critical evaluation was done to check the root cause of comparison between CCL and ECL employability skills.
- 29 core employability skills proposed by Human Resource Managers for Chemical Engineers was compared with the objectives set by Higher education commission in form of outcome based education
- It was concluded that out 29 core employability skills 17 were not present in curriculum.
- Moreover, out of 7 Constructs items, 4 construct items were almost totally disappeared in curriculum.

MISSING EMPLOYABILITY SKILLS IN CURRICULUM

Leadership Skills:

1) Team Building
2) Performance Management
3) Counseling
4) Strategic Management
5) Decision Making

Interpersonal Skills:

6) Customer Service
7) Problem Solving
8) Negotiation
9) Stress Management

Critical Thinking Skills:

10) Analyzing
11) Logical Reasoning,
12) Comparing & Contrasting and
13) Transformation & Innovation

Technology Skills:

14) Database Management System

Work Ethic Skills:

15) Time Management
16) Socialization
17) Emotional Stability

CONCLUSION

- There exist a difference between Current competence level employability skills of students & graduates vs. Expected competence level of Human Resource Managers(HRM)- HRM expect high level of skills from students and graduates.

- Out of 29 employability skills proposed by HRM, 17 employability skills were not present in curriculum.

Dr. Muhammad Usman Awan
Assistant Professor
Institute of Quality & Technology Management
University of the Punjab, Lahore, Pakistan
Email: *Usman.iqtm.pu.edu.pk*
Mobile: *+923009402748*

Thank You

Q & A