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TECHNOLOGICAL TRANSFORMATION: THE EMERGING TRENDS IN EMPLOYABILITY SKILLS AMONG ENGINEERING GRADUATES: AN EMPIRICAL ANALYSIS

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ABSTRACT
We are living in a fast-paced competitive world where new technologies are being introduced almost every day, trends are evolving, manual jobs are becoming obsolete, and new tech jobs are on the rise. Technology has eased its way into our lives, it has given rise to uncertainty. The rapid changes in the technologies have also transformed the need for in-demand skills in the industries. In addition, newer domains are emerging in the market and this is fuelling the demand for talent with the required skills that are capable of driving the organizational growth. Organizations and educational institutes need to cater to the requirements of the industry for upcoming generations and lay foundations for devising solutions that support rapid skill development. Industry 4.0 was in the recent past in 2011, its focus was on digitalization and included automation, artificial intelligence (AI) technologies, connected devices, data analytics, cyber-physical systems, digital transformation, and more., India needs to invest in constant upskilling of human resources and stay agile. Industry 5.0, seems to have already set in, 2020. The focus is personalization and humanization, emphasizing collaboration between humans and machines to create sustainable products and services and to deliver value-added tasks to customers. Hence, it is essential for us to keep learning and constantly upskill ourselves. The importance of upskilling for leaders by stating, "When a person stops learning, they start falling behind." Therefore, we must learn new skills in such uncertain times to adapt to rising jobs in the era of industrial transformation. Over the past few years, the world is experiencing rapid changes in every sector. New employment avenues have opened and due to this, the demand for tech-savvy new-age skills has also grown. Keeping this in view this article is focus on to study the emerging trends in reskilling, upskilling and capacity building programmes.

KEY WORDS: *Uncertainty, Technological Transformation, Artificial Intelligence, Data Analytics, Digital Transformation, Upskilling, Reskilling, Capacity Building.*

1. INTRODUCTION

Over the past few years, the world is experiencing rapid changes in every sector. New employment avenues have opened and due to this, the demand for tech-savvy new-age skills has also grown. This has also led to a positive shift in terms of working and increased the demand to attain new skills. However, not every employee can adapt to these shifts, and the globe is experiencing a shortage of skilled talent. As per The International Labour Organization (ILO), the situation is severe. The body anticipates a talent shortage of 29 million will hit the world by the year 2030. The education system has undergone significant transformation, focusing on making education accessible, high-quality, and future-ready. The COVID-19 pandemic has further accelerated this transformation. As the industry grows quickly and navigates sudden shifts and technological disruptions, it is essential for stakeholders to interpret the needs of the learners. In doing so, they can find innovative solutions to bridge educational gaps and improve learning outcomes.

Even in India, the scenario is the same and the talent skill gap is significant. According to a survey conducted by Statista, the number of employable personnel in the country is 46.2% as of now in 2022. The major reason for the unemployable talent not being able to secure employment opportunities is the lack of skill-based education and skill development. To solve this issue, skill development is a crucial factor that will help cope with the rapidly

changing environment. As skill development is emerging to be the need of the hour, it is the key focus of the organizations. The rapid changes in the technologies have also transformed the need for in-demand skills in the industries. In addition, newer domains are emerging in the market and this is fuelling the demand for talent with the required skills that are capable of driving the organizational growth.

Organizations and educational institutes need to cater to the requirements of the industry for upcoming generations and lay foundations for devising solutions that support rapid skill development. The Industry 4.0 was in the recent past in 2011, its focus was on digitalization and included automation, artificial intelligence (AI) technologies, connected devices, data analytics, cyber-physical systems, digital transformation, and more., India needs to invest in constant upskilling of human resources and stay agile. Industry 5.0, seems to have already set in, 2020. The focus is personalization and humanization, emphasizing collaboration between humans and machines to create sustainable products and services and to deliver value-added tasks to customers.

It's impossible to dispute that global patterns have shifted dramatically during the last few years. These developments have also resulted in a slew of positive changes in the workplace. Traditional employment has given way to a plethora of entertaining jobs ranging from photography, web design, travel, blogging, medical management, and journalism, among others. The Indian workforce, on the other hand, is not yet prepared to deal with these rapid changes, with more than half of prospective professionals failing to meet the requirements for 'high employability.' Even though 53% of Indian enterprises were unable to hire qualified people due to a lack of skills, the International Labour Organization anticipates a talent shortage of 29 million by 2030. This glaring lack of future abilities is cause for serious concern. The talent gap affects a variety of businesses, but it has the common denominator of placing India among the top five countries with acute skill shortages. Several facts and studies explain why this gap exists, yet the rising workforce that is meant to fill those positions lacks the skills that are sorely needed across the business.

2. SKILL DEVELOPMENT A PREROGATIVE FOR NATION BUILDING

Over time, the focus has shifted from conventional schooling to a more practical approach. The growth of additional learning aggregators, in addition to offering traditional coaching programmes, offers accessible learning classes to the youth. About a decade back, many of the jobs that we see today still needed to be created. As a matter of fact, we don't know how many of the current jobs will remain intact by the next decade. Some estimates suggest that this figure can easily exceed the 80%-mark by 2030. India is currently on the threshold of transformation. The wheels are moving, and change is inevitable. Every year around 28 million youth get added to the workforce. The National Sample Survey conducted a study that revealed that India's employment rate in 2018 was at a 45-year high of 6.1%. The Pandemic had put the country under economic slowdown, disrupting the nation's economic landscape. According to the Centre for Monitoring Indian Economy (CMIE), an astonishing 121.5 million jobs were lost in the first few months of the lockdown. However, this loss was narrowed down to 100.3 million in May 2020 to just 11 million in July 2020 and the urban employment rates in April, May, and June 2021 were 9.78%, 14.72%, and 10.08% respectively.

Today, automation and cost optimization measures have meant semi-skilled or unskilled people cannot get employment opportunities. The threshold of employability can only be crossed by people who are skilled in certain vocations, technologies, or activities. It is a fact that digitalization and globalization have brought about a significant shift in the nature of work. The lack of skills among the Indian workforce has resulted in high unemployability, so much so that around 53% of businesses in India are not able to hire suitable candidates. In an emerging economic landscape driven by digitization, the lack of skills, especially digital, is of serious concern. Estimates suggest that the lack of skills among aspiring candidates across industries leads to unemployment and a lack of productivity in business. To ensure the workforce retains its competitive edge and the gap between talent and unemployment is reduced, skill development training should be given a fillip.

The Main Objective of skill development is to:

- Provide industry-specific and in-demand training to unemployed and underemployed youth of the region and country.
- Enhance an individual's employability by developing skills to adapt to changing technologies and labour market demands.
- Improve the living standards of the people, and encourage more employment opportunities.
- Create lakhs of skill-based job opportunities for all.

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Skills in High-Demand in 2023

A report by **McKinsey & Company** estimates that by 2030, up to 375 million workers (about 14% of the global workforce) may need to switch occupational categories and learn new skills to adapt to changing job requirements. These numbers indicate a significant shift towards skill-oriented jobs in the job market, highlighting the need for individuals to continuously develop and update their skills.

Here are a few skills in which we see a huge shift & growth in coming years:

Data Science: Data Science is a rapidly growing field that combines statistical analysis, machine learning, and domain expertise to extract insights from data. It involves collecting, cleaning, and analysing large sets of data to identify patterns and make predictions. The scope of data science is vast, with applications in healthcare, finance, retail, social media, and more.

Python: Python is a high-level programming language that is popular for its simplicity, readability, and versatility. It is used for web development, data analysis, artificial intelligence, scientific computing, and more. Python has a large and active community that creates libraries and tools to simplify complex tasks and increase productivity.

Artificial Intelligence and Machine Learning: Artificial Intelligence (AI) and Machine Learning (ML) are subsets of computer science that involve the development of algorithms that can learn from data and make predictions or decisions. AI and ML have a wide range of applications, including autonomous vehicles, healthcare, finance, and more.

Digital Marketing: Digital Marketing is the practice of promoting products or services using digital technologies, such as social media, email, and search engines. It involves developing a marketing strategy, creating content, and analysing performance metrics to optimize campaigns.

Business Management: Business Management involves planning, organizing, and controlling the resources of an organization to achieve its goals. It encompasses a wide range of activities, including finance, marketing, operations, and human resources.

Google Ads and Analytics: Google Ads and Analytics are tools provided by Google that enable businesses to advertise and analyse their online presence. Google Ads enables businesses to create and display ads on Google and its partner sites, while Google Analytics provides insights into website traffic and user behaviour.

Communication Skills: Communication Skills refer to the ability to convey information effectively and efficiently. It includes verbal and non-verbal communication, as well as written communication. Good communication skills are essential in almost every profession, from business to healthcare to education.

Health Care: Health Care is the practice of preventing, diagnosing, and treating illnesses and injuries. It includes a wide range of professions, such as doctors, nurses, pharmacists, and healthcare administrators. The healthcare industry is constantly evolving, with new technologies and treatments emerging.

Cyber Security: Cyber Security involves protecting computer systems and networks from unauthorized access or attacks. It includes a wide range of activities, such as risk assessment, vulnerability testing, and incident response. Cybersecurity professionals are in high demand due to the increasing threat of cyberattacks.

Software and Product Development: Software and Product Development involve designing, developing, and testing software applications and products. It includes a wide range of activities, such as project management, programming, and quality assurance. Software and product development is a rapidly growing industry, with new technologies and innovations emerging every day.

Sales and Marketing: Sales and Marketing involves promoting and selling products or services to customers. It includes activities such as market research, product development, branding, and sales. Good sales and marketing skills are essential for businesses to succeed in a competitive marketplace.

Automation: Automation involves using technology to perform tasks automatically, without human intervention. It includes a wide range of activities, such as process automation, industrial automation, and home automation. Automation is becoming increasingly important in many industries, as it can increase efficiency, reduce costs, and improve safety.

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3. APPROACHES/TRENDS IN SKILL DEVELOPMENT

In today's rapidly evolving job market, academic qualifications alone are not enough to secure a good job. Employers are looking for candidates who possess relevant skills that can help them to perform better on the job. To keep up with this trend, individuals need to continuously update and develop their skills.

3.1 Hybrid Learning: The education system has undergone significant transformation, focusing on making education accessible, high-quality, and future-ready. The COVID-19 pandemic has further accelerated this transformation. Hybrid learning is a blended learning approach that combines both traditional in-person and online methods. It allows learners to learn depending on their preferences or circumstances. This type of learning approach offers a student-centric learning experience with flexibility and personalization. The goal of the hybrid learning system is to integrate both online and offline modes of learning seamlessly. Hybrid learning offers flexibility, personalization, and a more student-centric learning experience. Hybrid learning provides a more student-centric and effective learning experience while also enhancing the efficiency of the educational system.

3.2 Adaptive Learning: One sector that strongly repels the concept of 'one size fits all' is education. Over the decades, learners have been forced to adjust to learning or education systems or models which fixate on outcomes and not on the individual growth of students. It focuses on the requirements of the learners and uses a personalized teaching approach. Its models or platforms adjust the delivery of education and learning outcomes according to the student's progress. Four core elements of this type of learning enable a personalized teaching and learning style: individual traits, individual performance, personal development, and adaptive adjustment. With the global adaptive learning market size expected to grow to $5.3 billion by 2025.

3.3 Microlearning: Differentiate and learn: Microlearning involves breaking down complex topics into smaller, bite-sized chunks of information that are easier to digest. In this process, the data is differentiated into small chunks and then approached to learn. The capabilities and functionalities of every brain are different. A learned skill is advantageous only if it is recalled at the needed time. Therefore, to tackle this issue, microlearning involves supplying only the needed data to the individual that is going to be the base of the skill. Thus, with microlearning, learners learn the concept rapidly to accelerate the process of skill development. With its innovative approach, this concept is expected to be one of the unique trends in the skill development domain in the times to come.

3.4 Upskilling and Reskilling: In the era where technological advancements are at their peak, there is an increased demand for skilled individuals in the industry. The companies are ready to provide an employee-friendly working environment, but at the same time, they wish to promote upskilling and reskilling as well for their employees' growth. In upskilling, an employee cultivates additional skills or improvises the existing skills that could bring value to the organization. Reskilling requires the person to learn fresh talents for the existing role in a new domain. Upskilling and reskilling are the dire need of the hour in today's times to attract quality talent and retain the existing workforce. This is the reason why they will be a key element of the skill development strategy. Organizations can facilitate this process by giving opportunities such as On-Job-Training (OJT) and the option for employees to gain e-certifications in the desired skillset via the Hybrid learning model.

3.5 Investing in transferable soft skills development: While joining a company, an individual must have a professional set of skills like hard work, enthusiasm, honesty, and integrity to maintain a position and conduct organizational tasks. Possessing domain knowledge and hard skill is indeed important. Along with it, businesses nowadays, consider soft skills such as leadership, managerial, crisis management, problem-solving, analytical thinking, etc. to be equally important parameters while hiring talent. With the global paradigm shift in education, the emphasis has switched to developing skills at a young age. The 4Cs - communication, creativity, critical thinking, and character development — are commonly used to describe these abilities.

3.6 Inculcating in Entrepreneurship Education: Entrepreneurs are an inevitable part of a country's economy. During an economic survey by the Department for Promotion of Industry and Internal Trade (DPIIT), 14000 new startups were formed during the fiscal year 2022. With the incremental growth of new startups, demand for skilled labour will surge in the market. Additionally, these entrepreneurs will generate new employment opportunities that will support the thriving economy of India on a global scale. Furthermore, to create such future entrepreneurs, imparting skills in entrepreneurship right now is important and hence this will be one of the focus areas in skill development in the times to come. In the Indian MSME sector, the skilled resources are not up to the mark, which has affected the sector's growth. Skill shortages is a primary concern and need to be addressed. For any nation to progress, the young population must be the driving force and actively participate in nation-building.

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3.7 Gamification in organizations and Institutions: Gamification is set to the next thing in skill development. It leverages the engagement of employees or students to learn better and meet the goals efficiently. Gamification is the use of game design elements in non-game contexts, such as education. People tend to acquire skills efficiently when provided with a suitable environment. Therefore, gamification should be a part of the skill development program to accelerate the learning process and boost motivation. In addition, the concept supports learning with peers that connect students with other veteran learners who can train and motivate them in attaining a new skill.

3.8 Skill development: A priority for businesses: The rapid changes in the technologies have also transformed the need for in-demand skills in the industries. In addition, newer domains are emerging in the market and this is fuelling the demand for talent with the required skills that are capable of driving the organizational growth. Skill development is thus the priority for businesses. And five trends will emerge and will enhance the skill development programs of organizations. Organizations and educational institutes need to cater to the requirements of the industry for upcoming generations and lay foundations for devising solutions that support rapid skill development. For taking complete advantage of the growing industrial revolution 4.0 and 5.0, India needs to invest in constant upskilling of human resources and stay agile.

Objectives of the study

- To study the need for skills among the B.Tech graduates to obtain good placements.
- To list out skills required for B.Tech graduates.
- To examine significance of skills in the study area.
- To put forth suggestions based on the findings.

Sample and data collection

A quantitative approach was followed in this exploratory study. The participants selected for this study consisted of B.Teh graduates of various engineering colleges in Krishna and Guntur districts. 700 questionnaires were distributed among the selected college students. Simple random technique was deployed in the sample selection. The respondents were solicited to complete the google form. The resultant response rate of useable questionnaires was 91.7% (642).

Data Analysis

Table- 1: Correlation Matrix[a] of Job Skills in the Study Area

Correlation Matrix[a]												
	1	2	3	4	5	6	7	8	9	10	11	12
Grooming place an important role during interviews	1.000	.887	.858	.816	.806	.845	.707	.696	.627	.715	.721	.710
Mock interviews in the colleges boosts the confidence of students	.887	1.000	.900	.829	.814	.881	.723	.698	.610	.689	.694	.692
Advanced courses certificates are needed to get good placement	.858	.900	1.000	.870	.853	.915	.757	.758	.626	.710	.724	.707
Strong technical skills are needed to get good placement	.816	.829	.870	1.000	.911	.810	.674	.647	.622	.665	.672	.649
Communication skills are important for	.806	.814	.853	.911	1.000	.847	.694	.669	.628	.672	.684	.661

good placements												
My college is providing sufficient training for interviews	.845	.881	.915	.810	.847	1.000	.812	.786	.628	.747	.753	.752
Online teaching is more useful	.707	.723	.757	.674	.694	.812	1.000	.948	.748	.906	.899	.886
Class room presentations gives confidence	.696	.698	.758	.647	.669	.786	.948	1.000	.750	.896	.896	.881
Off line teaching is more useful	.627	.610	.626	.622	.628	.628	.748	.750	1.000	.735	.761	.701
Hybrid mode of teaching is more useful	.715	.689	.710	.665	.672	.747	.906	.896	.735	1.000	.978	.981
Project works and case studies are helpful in learning	.721	.694	.724	.672	.684	.753	.899	.896	.761	.978	1.000	.978
Teaching aids are useful in learning	.710	.692	.707	.649	.661	.752	.886	.881	.701	.981	.978	1.000
a. Determinant = 2.449E-8												

(Source: Primary Data)

The first part of output concerns data screening, assumption testing and sampling adequacy. Second part follows with hypothesis testing. In first part none of the values are more than 0.9 and in second part all the values are below 0.05 and determinant is more than 0.00001. Therefore, both are found to be significant.

KMO (Kaiser-Meyer-Olkin) and Bartlett's test

Kaiser-Meyer-Olkin (KMO) test is a proportion of how fit present information is for Factor Analysis. The test estimates sampling sufficiency for every factor in the model and for the total model. The measurement is a proportion of extent of variance among variance. The lower the extent, the more fit information is for Factor Analysis. Following Table- 1 shows the results of the KMO and Bartlett's test.

Table- 2: KMO and Bartlett's Test Relating to Job Skills in the Study Area

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.924
Bartlett's Test of Sphericity	Approx. Chi-Square	14078.407
	df	66
	Sig.	.000

(Source: Primary Data)

The above Table- 2 reveals that KMO value i.e., .924 is neither nearer to zero nor close to one. So, the range is found to be good. Bartlett's test for Sphericity compares correlation matrix (a matrix of Pearson correlation) to the identity matrix. In other words, it checks if there is a redundancy between variables that can be summarized with some factors. Therefore, this test should be momentous (i.e., have a significant value less than 0.05). A significant value from chi-square test shows that for the present data R-matrix is not an identity matrix. Here Bartlett's test for Sphericity is highly significant ($p<0.001$), therefore it is concluded that the factor analysis is appropriate.

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Table- 3: Anti-image Matrices for Job Skills in the Study Area

Anti-image Matrices												
	1	2	3	4	5	6	7	8	9	10	11	12
Grooming place an important role during interviews	.960[a]											
Mock interviews in the colleges boosts the confidence of students	-.435	.945[a]										
Advanced courses certificates are needed to get good placement	-.066	-.310	.922[a]									
Strong technical skills are needed to get good placement	-.078	-.094	-.359	.909[a]								
Communication skills are important for good placements	-.044	.048	.046	-.629	.920[a]							
My college is providing sufficient training for interviews	-.123	-.174	-.430	.199	-.332	.926[a]						
Online teaching is more useful	.142	-.102	.143	-.046	.032	-.300	.914[a]					
Class room presentations gives confidence	.000	.113	-.286	.154	.013	.031	-.632	.925[a]				
Off line teaching is more useful	-.048	-.089	.106	-.078	-.063	.062	-.060	-.154	.941[a]			
Hybrid mode of teaching is more useful	-.110	.061	.070	-.131	.020	.114	-.237	-.043	-.049	.928[a]		
Project works and case studies are helpful in learning	-.057	.124	-.148	.032	-.086	.130	-.046	-.048	-.354	-.265	.918[a]	
Teaching aids are useful in learning	.062	-.149	.106	.057	.053	-.193	.126	-.029	.302	-.581	-.551	.899[a]
a. Measures of Sampling Adequacy (MSA)												

(Source: Primary Data)

Table- 3 shows KMO, Bartlett's test of Sphericity and anti-image matrix. As per Kaiser's (1974) recommendations .000 to 0.49 unacceptable, 0.50 to 0.59 miserable, 0.6 to 0.69 mediocre, 0.7 to 0.79 middling, 0.8 to 0.89 meritorious, 0.9 to 1.00 marvellous. In the table KMO values for individual factors are formed on the diagonal of the anti-image correlation matrix. After the observation it is identified that all the factors the values are above 0.5. Thus, all the factors should be considered for communalities analysis. The off-diagonal values represent the partial correlation between factors. Therefore, off diagonal elements been scanned to ensure that they are lesser than diagonal values and found off diagonal values are lesser than diagonal values.

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Communalities

Initial communalities estimate the differences among each factor accounted for, from all the variables. Extraction communalities values are estimates of the differences in each factor accounted for the variables in the factor solution. Below Table- 4 shows the particulars of communalities of Job Skills in the Study Area.

Table- 4: Communalities- Job Skills in the Study Area

Communalities		
	Initial	**Extraction**
Grooming place an important role during interviews	1.000	.851
Mock interviews in the colleges boosts the confidence of students	1.000	.884
Advanced courses certificates are needed to get good placement	1.000	.921
Strong technical skills are needed to get good placement	1.000	.888
Communication skills are important for good placements	1.000	.881
My college is providing sufficient training for interviews	1.000	.874
Online teaching is more useful	1.000	.917
Class room presentations gives confidence	1.000	.904
Off line teaching is more useful	1.000	.768
Hybrid mode of teaching is more useful	1.000	.951
Project works and case studies are helpful in learning	1.000	.963
Teaching aids are useful in learning	1.000	.947
Extraction Method: Principal Component Analysis.		

(Source: Primary Data)

The above table-4 gives the communalities of initial and extraction. Principal component analysis deals with the initial hypothesis that all factors are common; so, in the table, values for the initial communalities are 1 for all the factors. The value in the column titled extraction shows the common differences in the data structure. For, "Project works and case studies are helpful in learning" explains 96.3 percent of variance observed is common difference. There is second dimension for observing these communalities is in terms of the ratio of difference explained by the underlying variables.

To understand about the exact level of difference among factors is initially assumed as all communalities are "1". But after the analysis the differentiated values for each variable are found. "Grooming place an important role during interviews" has 85.1 per cent, "Mock interviews in the colleges boosts the confidence of students" has 88.4 per cent, "Advanced courses certificates are needed to get good placement" has 92.1 per cent, "Strong technical skills are needed to get good placement" has 88.8 per cent, "Communication skills are important for good placements" has 88.1 per cent, "My college is providing sufficient training for interviews" has 87.4 per cent, "Online teaching is more useful" has 91.7 per cent, "Class room presentations gives confidence" has 90.4 per cent, "Off line teaching is more useful" has 76.8 per cent, "Hybrid mode of teaching is more useful" has 95.1 per cent, and Teaching aids are useful in learning has 94.7 per cent. Above variables shows the variance in structure. It is shown in Total variance Explained table which is following.

Table- 5: Total Variance Explained- Job Skills in the Study Area

Total Variance Explained									
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	9.476	78.969	78.969	9.476	78.969	78.969	5.379	44.827	44.827
2	1.159	9.655	88.624	1.159	9.655	88.624	5.256	43.797	88.624
3	.399	3.329	91.953						
4	.271	2.259	94.212						
5	.240	2.001	96.213						

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6	.114	.946	97.160						
7	.111	.928	98.087						
8	.089	.745	98.833						
9	.065	.539	99.371						
10	.041	.342	99.714						
11	.020	.168	99.882						
12	.014	.118	100.000						
Extraction Method: Principal Component Analysis.									

(Source: Primary Data)

The above Table- 5 shows that Eigen values related with each factor displays the differences explained by that particular linear factor. This table also shows the Eigen values in terms of percentage of difference explain. So, factor 1 explains 78.969 per cent, factor 2 explains 9.655 per cent of total variance; it should be clear that these two factors explain relatively large amount of variance of 88.624. Finally, it is concluded that the initial two variables explain relatively major part of difference whereas subsequent variables explain only small part of difference. There are two variables among all with Eigen value greater than 1. The Eigen values related with these variables are again shown and the percentages of difference explained in the columns are labelled extraction sums of squared loadings.

Form the above table-5 it is identified that only first two factors in Job Skills in study area are highly impacting aspect and the residual were of not that much. Because it only exceeds Eigen value more than 1.

Table- 6: Rotated Component Matrix[a]— Job Skills in study area

Rotated Component Matrix[a]		
	Component	
	1	2
Hybrid mode of teaching is more useful	.898	
Project works and case studies are helpful in learning	.894	
Teaching aids are useful in learning	.887	
Class room presentations gives confidence	.852	
Online teaching is more useful	.842	
Off line teaching is more useful	.712	
Strong technical skills are needed to get good placement		.870
Communication skills are important for good placements		.856
Advanced courses certificates are needed to get good placement		.855
Mock interviews in the colleges boosts the confidence of students		.855
Grooming place an important role during interviews		.817
My college is providing sufficient training for interviews		.798
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

(Source: Primary Data)

Above Table- 5.6 shows the Rotated Component Matrix[a]- Job Skills in the study area. On the basis of Oblimin with Kaiser Normalization, two groups emerged. These two groups consist of all those factors that have factor loadings greater than or least equal to 0.5. Thus, the first group there are six dimensions and this group is titled as Classroom variables. For second component there are six dimensions and these six dimensions are combined together to get one group extracted and it is conceptualized as Interview variables. These two groups are considered for further study.

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Table- 7: Component Transformation Matrix- Job Skills in study area

Component Transformation Matrix		
Component	1	2
1	.712	.702
2	-.702	.712
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.		

(Source: Primary Data)

The final part of the factor analysis output is a component Correlation matrix between the factors. This matrix contains the correlation coefficients between the factors. From Table- 7 it is understood that all these factors are interrelated with each other to some degree. The fact that these correlations exists tells that the constructs measured can be interrelated. If the constructs are independent then the component correlation matrix should have been identity matrix. Therefore, from this final matrix it appears that the independence of the factors cannot be assumed.

Findings

- All the 12 factors found to be significant in the study area.
- Among all the factors respondents' felt Project works and case studies are helpful in learning.
- Twelve factors can be grouped into two dimensions. The first one is titled as classroom variables and second one is titled as Interview variables.
- Among classroom Variables Hybrid mode of teaching is more useful found to be more significant.
- Among the Interview variables Strong technical skills are needed to get good placement found to be more significant.

Suggestions

- ✓ In the study area also, the skills prescribed by the literature found to be significant. It can be understood that BTech student's perceptions in the different areas are same but the priorities are different. Therefore, before planning for students' skill development programmes students' current skill set and desired skill set should be kept in mind.
- ✓ Project works and case studies will keep the students in the real-world situations and during the problem-solving process students will learn lots of skills. Therefore, more case study discussions and projects work should be taken up by the BTech students for their skill development.
- ✓ The faculty can inculcate knowledge among the students but where to use that knowledge and how to use this knowledge is very difficult. All the technical skills and behavioural skills should be practised by the student outside the class. Therefore, acquiring other than classroom skills are equally important for the student.
- ✓ Gen Y students are technocrats and electronic aids will attract their attention very well. Therefore, teaching should also be in hybrid mode where off-line teaching will be accompanied with online-teaching.

Conclusion

The research is conducted to identify the skills required by BTech students in the study area. Twelve factors are identified form the literature and same is considered for this study. From the analysis it is found that all the twelve factors considered for the study are significant in the study area as well. for the better understanding these twelve factors are grouped into two variables. The first one is classroom variables and second on is interview variables. According to the student's perception there is a need for more projects works and case studies so as to answer real life situations in the working area. The teaching should be done in the hybrid mode for better understanding. Many students felt that there is a need for certificate courses on advanced skills, the reason could be that in the engineering sector many advancements are coming-up more frequently and the same sometimes may not be included in the student's curriculum. The one more important problem is lack of qualified faculty in the engineering steam. Therefore, government should focus on the upgradation of the syllabus and faculty enrichment programmes so that both faculty and curriculum can meet the needs of the engineering sector.

REFERENCES

1. *Abdulwahed, M., Balid, W., Hasna, M. O., & Pokharel, S. (2013, August). Skills of engineers in knowledge-based economies: A comprehensive literature review, and model development. In 2013 IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE) (pp. 759-765). Bali, Indonesia: IEEE. https://doi.org/10.1109/TALE.2013.6654540.*
2. *Abell, S., & Napoleon, J. (2008). Moving up to management: leadership and management skills for new supervisors. Medford, OR: Inside Jobs Coaching Co.*

3. *Bennett, N. & G.J Lemione, (2014). "What VUCA really means for you?" Harvard Business Review, January – February 2014*
4. *Berger, K., Surovek, A., Jensen, D., & Cropley, D. (2014, October). Individual creativity and team engineering design: A taxonomy for team composition. In 2014 IEEE Frontiers in Education Conference (FIE) Proceedings (pp. 1-4). Madrid, Spain: IEEE. https://doi.org/10.1109/FIE.2014.7044131*
5. *Blom, Andreas and Hiroshi Saeki. (2011), "Employability and Skill Set of Newly Graduated Engineers in India", World Bank Policy Research Working Paper, 5640: 2*
6. *Blom, Andreas, and Hiroshi Saeki. Employability and Skill Set of Newly Graduated Engineers in India. 2011.*
7. *Carnevale, A. P., & Smith, N. (2013). Workplace basics: The skills employees need and employers want. Human Resource Development International, 16(5), 491-501.*
8. *CBSE JEE Main 2016: Check out the result analysis here!" (2016, April 27). India Today. Retrieved from www.indiatoday.intoday.in/*
9. *Chaita, Mercy V. Developing Graduate Employability Skills: Your Pathway to Employment. Universal-Publishers, 2016.*
10. *Coplin, B. (2012). 10 Things employers want you to learn in college, revised: The skills you need to succeed (Rev. ed.). Berkeley, CA: Ten Speed Press.*
11. *Coplin, Bill. 10 Things Employers Want You to Learn in College, Revised: The Skills You Need to Succeed. Ten Speed P, 2012.*
12. *Council for industry and higher education. Student Employability Profiles: A Guide for Employers. 2005.*
13. *Ernst & Young FICCI Report on Higher Education in India (2014), Available online at https://www.ey.com/Publication/vwLUAssets/EY_- _Higher_education_in_India/$FILE/EY-higher-education-in-india.pdf Prashant R. Nair / Procedia Computer Science 172 (2020) 831–837 837 Prashant R. Nair/ Procedia Computer Science 00 (2019) 000–000 7*
14. *Finch, E., & Fafinski, S. (2014). Employability skills for law students. Oxford, UK: Oxford University Press.*
15. *Fowler, A. (1998). Negotiating, persuading and influencing. London, UK: Chartered Institute of Personnel and Development.*
16. *Gerson, S., & Gerson, S. (2014). Technical communication: Process and product (8th ed.). New Dehli, India: Dorling Kindersley.*
17. *Greiff, S., Wüstenberg, S., Csapó, B., Demetriou, A., Hautamäki, J., Graesser, A. C., & Martin, R. (2014). Domain-general problem-solving skills and education in the 21st century. Educational Research Review, 13, 74-83.*
18. *Hansen, R. S., & Hansen, K. (n.d.). What do employers really want? Top skills and values employers seek from job-seekers. Quintessential Careers. Retrieved from www.livecareer.com/quintessential/*
19. *Higher Learning Research Communications Llorens, A., Llinàs-Audet, X., Ras, A., & Chiaramonte, L. (2013). The ICT skills gap in Spain: Industry expectations versus university preparation. Computer Applications in Engineering Education, 21(2), 256-264.*
20. *Holmes, Karen. What Employers Want: The Employability Skills Handbook. 2017.*
21. *Holtgreive, J. (2016, August 16). Too smart to fail? Inside Higher Ed. Retrieved from https://www.insidehighered.com*
22. *ICPC Factsheet (2019), Available online at https://icpc.baylor.edu/worldfinals/pdf/Factsheet.pdf*
23. *Kotter, J. P. (2013, January 9). Management is (still) not leadership. Harvard Business Review. Retrieved from https://hbr.org/*
24. *Laker, D. R., & Powell, J. L. (2011). The differences between hard and soft skills and their relative impact on training transfer. Human Resource Development Quarterly, 22(1), 111-122.*
25. *Lakshminarayanan, R., Kumar, M., & Ramanakumar, K. V. P. (2014, May). Six sigma methodology for addressing employability issue of engineering graduates. International Journal of Modern Education Forum, 3(2), 59-66. dx.doi.org/10.14355/ijmef.2014.0302.04*
26. *Leicester University. (n.d.). What are enterprise skills? Retrieved from www.2.le.ac.uk/projects/*
27. *Majumdar, A. (2017), "MacACM: Encouraging competitive programming via mentorship and outreach", XRDS 24(1): 14-15*
28. *Manoj, P., Raghu Raman, Krishnashree Achuthan and Bharat Jayaraman (2014), "Preparing Global Engineers: USA-India Academia & Industry-led approach", 44th ASEE/IEEE Frontiers in Education Conference Proceedings*
29. *Markes, I. (2006). A review of literature on employability skill needs in engineering. European Journal of Engineering Education, 31(6), 637-650.*
30. *Naimpally, A., Ramachandran, H., & Smith, C. (2012). Lifelong learning for engineers and scientists in the information age. Waltham, MA: Elsevier.*
31. *Nanda, P.K. (2019), "India's Higher Education Student Population grows by 8 lakhs", Live Mint, 21 September, 2019. Available online at https://www.livemint.com/education/news/india-s-higher-education-student-population-grows-by-8-lakh-hrd-ministry-1569081600712.html*
32. *NASSCOM, FICCI & EY Report , "Future of Jobs in India: A 2022 perspective. Available online at https://www.ey.com/Publication/vwLUAssets/ey-future-of-jobs-in-india/%24FILE/ey-future-of-jobs-in-india.pdf*
33. *National Employability Report Engineers (2019), Aspiring Minds, Available online at*

https://www.aspiringminds.com/researchreports/national-employability-report-for-engineers-2019

34. *National Skill Development Corporation Annual Update (2015), Available online at https://www.nsdcindia.org/sites/default/files/files/NSDC_Annual_Update_2014-15.pdf*
35. *Nguyen, D. Q. (1998). The essential skills and attributes of an engineer: A comparative study of academics, industry personnel and engineering students. Global Journal of Engineering Education, 2(1), 65-76.*
36. *Only 18% engineering grads are employable, says survey. (2014, July 15). Times of India Retrieved from www.timesofindia.indiatimes.com/*
37. *Ortiz, L. A., Region-Sebest, M., & MacDermott, C. (2016). Employer perceptions of oral communication competencies most valued in new hires as a factor in company success. Business and Professional Communication Quarterly, 79(3), 317-330. http://dx.doi.org/10.1177/2329490615624108*
38. *Puranik, A. (2015, August 8). 97% engineering graduates cannot speak English fluently: Survey. Hindustan Times. Retrieved from www.hindustantimes.com/*
39. *Radermacher, A., & Walia, G. (2013, March). Gaps between industry expectations and the abilities of graduates. In Proceeding of the 44th ACM technical symposium on Computer science education (pp. 525-530). Denver, CO: ACM.*
40. *Radermacher, A., Walia, G., & Knudson, D. (2014, May). Investigating the skill gap between graduating students and industry expectations. In Companion Proceedings of the 36th International Conference on Software Engineering (pp. 291-300). Hyderabad, India: ACM.*
41. *Ramesh, M.V., Renjith Mohan and Soumya Menon. (2016) "Live-in-Labs: Rapid Translational Research and Implementation-Based Program for Rural Development in India", IEEE 2016 Global Humanitarian Technology Conference Proceedings, pp.164-171*
42. *Rao, M. S. (2010). Soft skills: Enhancing employability: Connecting campus with corporate. New Delhi, India: I.K. International Publishing House.*
43. *Rao, M. S. Soft Skills - Enhancing Employability: Connecting Campus with Corporate. I. K. International Pvt, 2013.*
44. *Salas, E., Sims, D.E. and Klein, C. (2004), "Cooperation at work", Encyclopedia of Applied Psychology, Vol. 1, pp. 497-505.*
45. *Shokri, N. M., Lin, E. Y. E., Radzi, H. M., Mokhtar, R., Ghazali, F., Muslimen, M. A., & Tarmizi, M. A. A. (2014). Communication skills: A-must-have skills for today's leaders. In Proceedings of the 2nd Conference on Innovative Trends in Multidisciplinary Academic Research (ITMAR2014). Istambul, Turkey: Global Illuminators.*
46. *Singh, D. (2016, February 22). Most engineering students in India lack basic skills: Varun Aggarwal of Aspiring Minds. Retrieved from www.businesstoday.in/*
47. *Skills. (n.d.). Business dictionary. Retrieved from www.businessdictionary.com/*
48. *Skills. (n.d.). Cambridge dictionary. Retrieved from www.dictionary.cambridge.org/*
49. *Sommers, M. A. (2008). Great interpersonal skills. New York, NY: Rosen Publishing Group.*
50. *Stavenga de Jong, J. A., R.F.A Wierstra and J. Hermanussen, J. (2006) "An exploration of the relationship between academic and experiential learning approaches in vocational education", British Journal of Educational Psychology 76(1):155-169.*
51. *Tricot, A., & Sweller, J. (2014). Domain-specific knowledge and why teaching generic skills does not work. Educational Psychology Review, 26(2), 265-283.*
52. *Trought, Frances. Brilliant Employability Skills: How to stand out from the crowd in the graduate job market. Pearson UK, 2017.*
53. *Tulsi, P. K., & Poonia, M. P. (2015). Expectations of industry from technical graduates: Implications for curriculum and instructional processes. Journal of Engineering Education Transformations, 28(4), 42-49.*
54. *Tyson, Will. Teaching and Learning Employability Skills in Career and Technical Education: Industry, Educator, and Student Perspectives. Springer Nature, 2020*
55. *Veres, J. F. III, & Sims, R. R. (1999). Keys to employee success: What skills are really important for success in the future? In R. R. Sims & J. G. Veres. (Eds.), Keys to employee success in coming decades (pp. 223-245). Westport, CT: Quorum Books.*
56. *What Employers Want: The Employability Skills Handbook. 2017.*