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Contents

From the Desk of National President

In the ever-changing landscape of industries and institutions, the significance of research becomes increasingly pronounced, offering insights into pathways for advancement and growth. As we embark on this voyage through the domains of organizational dynamics, educational frameworks, and innovative strategies, we stand at the intersection of exploration and enlightenment. This collection of papers presents a diverse array of scholarly exploration and empirical investigation, each shedding light on distinct aspects of contemporary challenges and opportunities. From examining the intricate relationship between organizational climate and managerial effectiveness in the IT sector to highlighting the pivotal role of higher education institutions in honing the professional skills of graduate students, these works provide invaluable perspectives into modern endeavours. Among the various topics explored, the endeavour to forecast safety culture more accurately underscores our collective commitment to fostering safer work environments. Similarly, the integration of artificial intelligence tools in revolutionizing the recruitment process marks a significant advancement in talent acquisition and management, promising efficiencies and effectiveness previously unimaginable.

Digging deeper into specific industries, the analysis of the correlation between training participation, incident-based damages, and maintenance costs in the mining sector presents a compelling narrative of the connection between human capital development and operational excellence. Likewise, the importance of employability skill development in bridging the academia-industry gap emphasizes the need for holistic education in nurturing future-ready professionals. Themes of transportation and knowledge management recur throughout, highlighting their crucial roles in shaping infrastructural frameworks and fostering intellectual capital. From integrating sustainability into higher education to envisioning a global education system that transcends borders, these inquiries encourage us to rethink traditional paradigms and embrace innovative solutions. The resilience of entrepreneurship in the digital era is showcased through a compelling case study, offering valuable lessons in adaptation and perseverance amidst disruption and uncertainty. Similarly, the exploration of innovative HR practices underscores the transformative potential of human resource management in driving organizational excellence and enhancing employee engagement. As we navigate the complex terrain of employee training and development, these papers serve as guiding lights, steering us toward a future characterized by progress, prosperity, and purpose. This compilation sparks dialogue, fosters discovery, and inspires meaningful action, encouraging scholars, practitioners, and policymakers alike to embark on a journey of continuous learning and evolution.

We don't just teach, we are transforming our nation. We are committed to serving individuals on a journey of self-discovery and growth, we unlock their potential to make meaningful contributions to our nation through Learning & Development. We follow the art of giving by tapping into the essence of humanity, by sharing knowledge, resources, and compassion, we build a society characterized by empathy and unity.

Anita Chauhan

From the Desk of Chief Editor

Demand for skilled and Trained Professionals

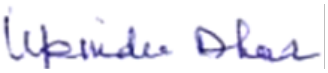
In October 2023, the global count of social media users reached 4.95 billion, constituting 61.4 percent of the entire global population. Between April 2022 and April 2023, the number of new social media users reached 150 million, marking a 3.2% year-over-year increase. At the same time, the pace of technological change is becoming faster to the point where seemingly imperceptible trends can have a significant effect on business. Innovation may well be a primary force behind these changes, but many of the effects are also social in nature. Ever since the industrial revolution, social impact has been considered an important factor in technological decisions. In the early days of capitalism, public opinion formed an important part of the decision making process. The size of corporations and the social power they controlled was also a factor in technological decisions. The advent of railroads and the ability to send telegrams revolutionized the way businesses were conducted. The speed at which information could be transmitted and processed was quickly altering the way people lived their lives.

Technological change has had a significant impact on how people interact with each other. The widespread use of automobiles has led to greater mobility. This has increased the range of opportunities available to people and increased social interaction. The ease at which people can access the internet and maintain secure web connections has broadened the scope of real-world. Interactions. Technological change has also had a profound impact on education. The spread of the computer and the accompanying technologies, such as the internet has led to a dramatic expansion of the educational establishments. As more people were able to take advantage of advanced technology, higher education has followed the trend. At the same time, the rapid spread of the internet has reduced barriers to entry for smaller businesses and the creation of new businesses. This combination has led to the increased number of businesses that are available to consumers online. Technological change has also had a profound impact on the employment market.

The advent of the internet and associated technology has led to an expansion of the work force. This has increased the demand for skilled and trained professionals. At the same time. The internet has created new forms of communication between employees, leading to the growth of the social impact of technology. The social impact of technology is also seen in its influence on the economy. The widespread use of technology by companies and individuals has led to a decrease in the cost of doing business. The internet has also reduced the cost of disseminating information across the country. Because of this, the economy has been able to increase economic activity throughout the country. The impact of technology on the social networks available to users is particularly strong. Over the past two years, there has been a consistent rise in the count of social media users. The 2023 user count reflects a 4.5% growth compared to 2022. Between August and October 2023, there was an average of 9.6 per second newly joined social media users.

The growth of social media has led to an expansion of the internet and an increase in internet users. Additionally, the internet has provided users with the ability to form forums and communicate with one another. These forum activities have helped to create and build cohesive communities across various geographical locations. In the context of the global economy, these kinds of communities have helped the economy to grow. Technological change is always occurring and it continues to impact society in many ways. However, the social impact of technology is becoming more pronounced as people's lives become more digitally connected. As technologies continue to advance, society will benefit as more opportunities are made available to those who are prepared to take advantage of them.

The readers of IJTD are requested to go through the contents of the journal and help us in improving the usefulness of this publication by offering suggestions based on their critical review and constructive observations. The prospective contributors to this journal are advised to follow APA pattern (7th Edition) for presenting the references.



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Effect of Dysfunctional Organisational Climate on Managerial Effectiveness in IT Sector

R. Kherde*
D. Christian**

ABSTRACT

This research was carried out in different information technology companies throughout India, with a total sample size of 311 participants. The study utilised the MAO-C (Motivational Analysis of Organisation-Climate) survey questionnaire, developed by Pareek, to evaluate the Organisational Climate of the workplace. The PE-G (Personal Effectiveness Scale-General) developed by Pareek was used to measure Managerial Effectiveness. The study focused on the Dysfunctional Climate motives such as Control, Dependency, and Affiliation to determine their relationship with Managerial Effectiveness. The findings indicate a negative correlation between Dysfunctional Climate and Managerial Effectiveness.

KEYWORDS

Affiliation climate, Dependency, Organisational dynamics, Personal Effectiveness, Performance evaluations

INTRODUCTION

The Organisational Climate plays a pivotal role in shaping the attitudes and perceptions of employees toward their work environment, job roles, and management practices. In the context of the Information Technology (IT) sector, the functional aspect of the Organisational Climate holds significant importance as it profoundly influences both managerial and employee behaviours and performance. A functional Organisational Climate can foster higher motivation, job satisfaction, and commitment among employees, leading to improved overall performance outcomes. To comprehend and analyse the organisational climate effectively, the motivational linkage framework proposed by Likert in 1967 provides a relevant and comprehensive approach. Within this framework, understanding the interplay of six key motives or needs—namely, Achievement, Affiliation, Expert influence,

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Control, Extension, and Dependency—becomes crucial in deciphering human behaviour within organisational settings. Among these motives, some are considered functional, contributing positively to the work environment, while others are classified as dysfunctional, with the potential to yield adverse effects.

In this research article, our focus is specifically directed towards exploring the impact of Dysfunctional motives as independent variables on Managerial Effectiveness, which is treated as the dependent variable. Given the significance of managerial roles in the IT sector, understanding the relationship between Dysfunctional motives and Managerial Effectiveness is essential. The insights derived from this study will enable us to gain a deeper understanding of how certain aspects of the Organisational Climate can influence managerial performance, offering valuable implications for fostering a more functional work environment in the IT sector. Consequently, this research seeks to contribute to the body of knowledge aimed at enhancing Managerial Effectiveness and promoting overall organisational success.

REVIEW OF LITERATURE

Several studies have been conducted to investigate the impact of Organisational Climate on Managerial Effectiveness in the IT sector. For instance, Steenbergen & Van Der Hulst (2015) found that a positive functional Organisational Climate was positively associated with the job satisfaction of IT professionals. The study suggests that when employees perceive a positive Organisational Climate, they are more likely to experience greater job satisfaction, which can improve their motivation and commitment to the organisation. Saini & Kadian (2018) found that a positive organisational culture and supportive work environment can enhance employee commitment and job performance. Effective communication, as found in Hamed et al. (2019), positively correlates with job satisfaction and employee engagement. Supportive leadership, as discovered by Nielsen et al. (2017), is also essential in creating a positive Organisational Climate and fostering employee motivation, commitment, and performance.

Fair performance evaluations are also important in building a positive functional Organisational Climate. A study by Kim & Lee (2016) found that fair performance evaluations were positively associated with employee job satisfaction and commitment. The study suggests that when employees perceive that their performance is being evaluated fairly and objectively, they are more likely to be motivated to perform better and contribute to the organisation's success. In summary, a functional Organisational Climate is essential for enhancing Managerial Effectiveness in the IT sector. Studies have shown that a positive Organisational Climate, characterised by clear communication, supportive leadership, fair performance evaluations, opportunities for growth and development, and a collaborative work culture, can improve employee job satisfaction, engagement, and commitment, leading to better performance outcomes.

Organisational Climate refers to the prevailing attitudes, behaviours, and values that characterise a workplace. A Dysfunctional Organisational Climate is one in which employees feel unsupported, undervalued, and disconnected from their colleagues and the organisation's goals. Dysfunctional Organisational Climate can have significant negative impacts on employee morale, motivation, and productivity, and can ultimately lead to turnover and

poor organisational performance.

Negative work environments can cause stress, burnout, turnover, and reduced job satisfaction and commitment. A culture promoting open communication, mutual trust, and employee empowerment can prevent Dysfunctional Organisational Climates. Leadership behaviours promoting trust, communication, and employee empowerment can prevent negative work environments. Overall, literature reviews on Dysfunctional Organisational Climate highlight the importance of addressing factors such as poor communication, lack of trust, and micromanagement in order to create a positive work environment that supports employee well-being, job satisfaction, and organisational performance.

RATIONALE

The rationale of this study is based on recognising the crucial role that the Organisational Climate plays in influencing Managerial Effectiveness within the IT sector. By investigating the impact of Dysfunctional motives as independent variables, the research aims to address practical relevance by understanding potential challenges faced by managers in the dynamic IT industry. Additionally, it seeks to explore how Dysfunctional motives may affect employee well-being, optimise overall organisational performance, and influence strategic decision-making processes. By shedding light on these aspects, the study intends to inform interventions and contribute valuable insights to the field of organisational psychology, ultimately leading to a more supportive work environment and improved managerial outcomes.

OBJECTIVES

Following objectives are taken for this study,

To study the strength of relationship between Dependency Dominant Climate and Managerial Effectiveness.

To investigate the relationship of Affiliation Dominant Climate with Managerial Effectiveness.

To study the relationship of Dysfunctional Climate motives on Managerial Effectiveness.

HYPOTHESES

1. There is a significant negative relationship between Control Dominant Climate and Managerial Effectiveness.
2. There exists a significant negative relationship between Dependency Dominant Climate and Managerial Effectiveness.
3. A significant negative relationship exists between Affiliation Dominant Climate and Managerial Effectiveness.
4. There is a significantnegative relationship between Dysfunctionalclimatemotives (Control, Dependency and Affiliation) and Managerial Effectiveness.

METHOD

Sample: This study selected its sample from various IT companies across India and involved managerial-level employees as participants, with a total sample size of 311. The researchers used a purposive random sampling method and allowed each participant to choose whether or not to participate in the study.

Statistical Treatment

At the first stage, Mean and Standard Deviation has been computed. Secondly, in order to search the strength of relationship between independent variable and dependent variables Pearson's Product Movement Correlation was computed. Further, to

find the predictor effect on criterion, Regression Analysis was computed.

Tools: The following tools have been used for the purpose of data collection:

(i) **Organisational Climate Measure**

Pareek (1979) developed Motivational Analysis of Organization (MAO-C) to gather data on three dimensions of Organisational Climate: Control, Dependency, and Affiliation. Control-dominant climates prioritise orderliness and personal power, Dependency-dominant climates prioritise seeking assistance and maintaining relationships based on approval, while Affiliation-dominant climates prioritise establishing and maintaining personal relationships and emotional expression. There are six statements for each task dimensions and in so far total 72 statements comprise this instruments. These 6 statements in each dimension are to be ranked from 6 as most likely to 1 as least likely,

Reliability and Validity

Reliability

Retest reliability of MAO-C has been reported by Sen (1982) and by Surti (1983).

The internal consistency of the MAO-C has been assessed using Cronbach's alpha, which is a measure of the correlation between different items on the scale. Studies have consistently found high levels of internal consistency for the MAO-C, with alpha coefficients ranging from .81 to .96, indicating a high degree of reliability.

Validity

Construct validity has been established on the basis of factor analysis of MOA-C data from large multi-location company in information technology (415 respondents). A 12-factor solution was attempted, using principle components analysis with Quartimax rotation. Factor 1 had high loadings on five achievement and five extension items, and negative loadings on five dependency and eight control items. This factor is a general achievement with human concern. It also had high loadings on orientation and interpersonal relationships. Clean factors emerged for expert power (Factor 4), dependency (Factor 2), and affiliation (Factor 6). Regarding organisational processes, there were clear factors (given in parenthesis) for IP relationship (12), supervision (3), problem management (12), managing mistakes (5), decision-making (2), along with dependency climate), trust (8), reward management (7), risk-taking (11), and innovation (9). Construct validity is also provided by other authors (see Parekh, 1989b)

(ii) Managerial Effectiveness Questionnaire:

This questionnaire-cum-scale has been developed by Prof. Udai Pareek (Pareek, 2014). Basically this is a Personal Effectiveness Scale-General (PES-G). It is to be used for various groups such as managers, counsellors, students and teachers. This test gives personal effectiveness types in terms of self-disclosure, feedback, and perceptiveness. It contains 15 statements, five for each of the three aspects. A respondent checked each statement, indicating the extent to which it is true of him or her on 5 point scale.

Reliability and norms: Alpha for group of 68 managers was found to be 0.90.

Mean and SD values based on responses of 68 managers are

1. Self-disclosure - 10.0 and 3.0

2. Openness to feedback – 14.0 and 3.0

3. Perceptiveness- 13.0 and 3.0

RESULTS AND DISCUSSION

In present study, all dysfunctional motives of Organisational Climate viz. Control, Dependency, and Affiliation were separately tested with Managerial Effectiveness. Further an effect of Dysfunctional Climates on Managerial Effectiveness was also measured. At first stage, mean and standard deviation were computed to see the normality of the sample. As mentioned in Table 1-1, mean value and SD were 39.86 & 6.36 for Control, 38.23 and 5.73 for Dependency, and 39.08 & 5.98 for Affiliation dominant climate respectively. The mean and SD for Dysfunctional Climate were found to be 39.06 and 3.79 respectively. The data then treated for finding relationship between Climate as an independent variable and Managerial Effectiveness as dependent variable. To see the predictability of the variable, the regression analysis was further undertaken. The findings and their discussion are as follows.

Control Climate with Managerial Effectiveness

The findings reveal a negative and statistically significant Correlation Coefficient of -0.602, surpassing the threshold p-value of 0.148 required for significance at the 0.01 level (Garrett, 1981). This Correlation Coefficient of -0.602 suggests a substantial 60% level of non-agreement between the two variables, emphasising that this observed relationship is not a mere coincidence. It denotes a negative correlation, implying that as the Control Climate variable increases, there is a concurrent decrease in the Managerial Effectiveness variable. This statistical significance highlights a linear association between Control Climate and Managerial Effectiveness, suggesting that the two are closely related.

However, it's essential to recognise that drawing conclusive insights solely based on the Correlation Coefficient is not advisable. Therefore, regression analysis was employed to further validate the significance of this relationship. This analysis led to the creation of regression equation, which can potentially predict one variable's score based on the other. The regression equation for Control Climate (X) and Managerial Effectiveness (Y) as Y = -0.3083X + 51.04 reinforces the negative inclination observed in the Correlation Coefficient. It essentially means that as Control Climate (X) increases, Managerial Effectiveness (Y) is predicted to decrease by -0.3083 units for every one-unit increase in Control Climate. The constant term 51.04 represents the 'Y' intercept, signifying the value of Managerial Effectiveness when Control Climate is at zero.

In the study, the Correlation Coefficient of -0.602 between Control Climate and Managerial Effectiveness led to a Coefficient of Determination of 0.36. This figure means that 36% of the information about Managerial Effectiveness can be attributed to variations in Control Climate. In simpler terms, Control Climate does contribute significantly to Managerial Effectiveness but is not the sole predictor. The weak effect of Control Climate on Managerial Effectiveness suggests that other factors beyond Control Climate play a crucial role in shaping effective managerial practices.

Numerous supporting studies in the realm of organizational behaviour and leadership provide context for these findings. Sinha (1980) conducted a study on organisational dynamics in the form of leadership styles and Organisational Climate in different organisations, highlighting that a

change from authoritarian or control style to participative style had the main positive influence on Organisational Climate. Similarly, an investigation by Purohit and Wadhwa (2012) noted that organisations with rigid control structures struggled to adapt changing practices, negatively impacting functional effectiveness. This study underscores the importance of a balanced organisational climate within the dynamic IT sector. While Control Climate has a notable impact on Managerial Effectiveness, it's essential to consider the broader context of leadership. Effective management in this sector requires a nuanced approach, recognising that various factors interact to influence Managerial Effectiveness.

Dependency Climate and Managerial Effectiveness

The data (Table No.1-1), unveiled a significant negative correlation, with a coefficient of -0.531, deemed statistically significant at the 0.01 level. This correlation indicates a moderate relationship where 53% of the variability aligns in a negative direction between Dependency Climate and Managerial Effectiveness, while 47% represents non-agreement, firmly establishing this connection as more than mere chance. The negative correlation suggests that as Dependency Climate increases, Managerial Effectiveness tends to decrease. However, the study exercised caution against drawing definitive conclusions based solely on the Correlation Coefficient.

To delve deeper and validate this relationship, study employed regression analysis. While the Correlation of Coefficient of -0.531 underscores a significant and meaningful relationship between Dependency Climate and Managerial Effectiveness, the ensuing regression analysis unveiled a more nuanced understanding. Dependency Climate indeed have an influence over Managerial Effectiveness, but it's not the sole determinant. Other factors may also be at play. Therefore, a comprehensive approach is essential for a holistic grasp of the impact of Dependency Climate on Managerial Effectiveness.

The regression equation, represented as Y = -0.7951X + 69.556, suggests that for every unit increase in Dependency Climate (X), Managerial Effectiveness (Y) is predicted to decrease by approximately 0.7951 units. The intercept of 69.556 indicates the predicted Managerial Effectiveness when Dependency Climate is zero. Furthermore, the Coefficient of Determination, which quantifies the extent to which Dependency Climate explains variations in Managerial Effectiveness, was computed as 0.28. This means that 28% of Managerial Effectiveness variability can be attributed to changes in Dependency Climate. While this indicates a low influence, it also highlights the need for a more comprehensive approach to understanding managerial effectiveness within the IT sector.

The outcomes of this study resonates with earlier research. Study by Jain et al. (2007) on the motivational climate in ITC education and training institutes, emphasises an excessive Dependency Climate can hinder autonomy, creativity, and proactive decision-making management, thus potentially impacting effectiveness. Similarly, research by Purohit and Wadhwa (2012) found that a balanced Dependency Climate can enhance collaboration and collective problem-solving, aligning with the notion that too much dependency might impede effectiveness.

Affiliation Climate and Managerial Effectiveness

The study explores the relationship between Affiliation Climate and Managerial Effectiveness, with results presented in Table No 1-1. The Correlation

Coefficient, which stands at -0.559, is statistically significant at the 0.01 level, surpassing the required threshold ($p < .01$), as determined by Garrett (1981). This coefficient signifies a above moderate negative correlation, demonstrating that 56% of the variability aligns negatively between Affiliation Climate and Managerial Effectiveness, while 44% represents non-agreement, firmly establishing this connection as more than mere chance.

This negative correlation implies that as Affiliation Climate increases, Managerial Effectiveness tends to decrease, indicating a proportional inverse linear relationship between the two variables. While this points to a productive connection, we are cautious not to draw definitive conclusions solely based on the Correlation Coefficient. To search further and validate this relationship, regression analysis was done. The regression equation, $Y = -0.3636X + 53.144$, underlines the negative acceleration of both variables, implying that of every unit increase in Affiliation-oriented Climate (X), Managerial Effectiveness (Y) is predicted to decrease by approximately 0.3636 units. The intercept of 53.1444 indicates the predicted Managerial Effectiveness when Affiliation Climate is Zero.

To quantify this relationship further, the Coefficient of Determination calculated, which yielded a value of 0.31. This means that 31% of the variability in Managerial Effectiveness can be explained by changes in Affiliation Climate. Although Affiliation Climate significantly influences Managerial Effectiveness, it's vital to recognise that other variables play a role. Therefore, a holistic understanding of the impact of Affiliation Climate on Managerial Effectiveness should consider additional factors.

Supporting studies by Khanna (1985) highlight that Affiliation Climate can sometimes foster an environment that overly values consensus and harmony, potentially leading to slower decision-making, a lack of adaptability and subsequently, negatively correlated with total effectiveness. Similarly, researches emphasise that while collaboration is important, an excessive emphasis on affiliation can hinder autonomy and innovation, ultimately affecting Managerial Effectiveness.

Dysfunctional Climate and Managerial Effectiveness

The study delves into the association between Dysfunctional Climate and Managerial Effectiveness, with findings summarised in Table 1-1. The computed Correlation Coefficient of -0.346 is both statistically significant ($p < 0.01$) and negative, more than required p-value of 0.148 at the 0.01 level (Garrett, 1981). However, this relationship is characterised as weak. This negative Correlation Coefficient of -0.346 signifies a limited agreement, explaining only 35% of the negativity between the two variables, with the remaining 65% representing discordance. Importantly, this connection is not attributable to random chance. It suggests that as one variable increases in value, the other tends to decrease, indicating opposite directions of movement.

Further, regression analysis was applied to the data. This process aims to determine whether an individual's score on one variable can predict their score on the other. The strength of the relationship is gauged by the Correlation Coefficient. To delve deeper into this relationship and assess its predictive value, the regression equation as $Y = -0.247X + 68.117$ was formulated. This equation exhibits negative acceleration, indicating that as Dysfunctional Climate (X) increases, Managerial Effectiveness (Y) decreases. For every unit increase in Dysfunctional Climate,

Managerial Effectiveness is predicted to decrease by approximately 0.247 units. The intercept of 68.117 indicates the predicted Managerial Effectiveness when Dysfunctional Climate is zero.

Quantitatively, the Coefficient of Determination was computed, yielding a value of 0.12. This suggests that only 12% of the variability in Managerial Effectiveness can be explained by changes in Dysfunctional Climate, indicating a very weak effect. It's crucial to acknowledge that while Dysfunctional Climate is a contributor to Managerial Effectiveness, other factors should be considered to comprehensively assess its impact. Dysfunctional Climate demonstrates a statistically significant but very weak effect on Managerial Effectiveness. To gain a holistic understanding of its influence, it is imperative to account for additional contributing variables.

The findings of this study find resonance in existing research. Studies by Lehal (2007) underscore the adverse impact of a Dysfunctional Climate on Managerial Effectiveness. Similarly, research by James et al. (2008) highlights the detrimental effects of excessive dysfunction on communication, and ultimately decision-making, and goal attainment influencing Managerial Effectiveness. In another study of public sector entities, Rantanen et al. (2007a) identified many of the inherited weaknesses such as ineffective leadership, poor management skill, lethargic decision-making process amongst other as the attributes of Dysfunctional Climate.

CONCLUSION

The study delved into the relationships between different Organisational Climates (Control Climate, Dependency Climate, Affiliation Climate, and Dysfunctional Climate) and Managerial Effectiveness in the IT sector. The findings indicated significant correlations, revealing nuanced insights for effective management.

Control Climate: The study revealed a strong negative correlation, highlighting the impact of control on Managerial Effectiveness. Overemphasis on control hindered Managerial Effectiveness, emphasising the need for a balanced approach to leadership styles.

Dependency Climate: The moderate negative correlation suggested that dependency can foster collaboration but may hinder autonomy. Balancing collaboration with individual freedom is essential for effective managerial practices.

Affiliation Climate: A substantial negative correlation pointed out the influence of affiliation on Managerial Effectiveness. While collaboration is crucial, an excessive focus on consensus might slow down decision-making processes. Striking a balance is key.

Dysfunctional Climate: Despite a weak correlation, dysfunctional aspects negatively impacted Managerial Effectiveness. Even minor dysfunctions disrupted communication and decision-making. Proactive intervention is necessary.

IMPLICATIONS

In the dynamic IT sector, effective management is essential for organisational success. To achieve this, leaders must embrace adaptive leadership styles that balance control and empowerment. Encouraging teamwork is vital, but it's equally crucial to grant individuals the freedom to make decisions, fostering a sense of ownership and responsibility. Streamlining decision-making processes is key to ensuring prompt responses to challenges. Delays caused by excessive consensus-seeking can hinder progress. Identifying and promptly addressing dysfunctional aspects within the organisation is crucial. Interventions and

corrective measures are necessary to maintain a healthy Organisational Climate.

Furthermore, ongoing research is fundamental. Exploring how these Organisational Climates interact with other factors provides a comprehensive understanding. This continuous learning approach enables organisations to adapt to evolving challenges effectively. Implementing these strategies can transform Organisational Climates, creating a conducive environment for effective managerial practices in the ever-changing landscape of the IT sector. Leaders who embrace these principles pave the way for their organisations to thrive amidst complexity and change.

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Higher Education Institutions: The Key Players in Training and Developing Professional Skills among Graduate Students

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ABSTRACT

Industries and the corporate world grapple to address the changes initiated by technology and business practices by assimilating people with the required skills to take the organizations forward. As the productivity and performance of the workforce depend on the skills of the employees, educational systems that supply the required human resources to industries must imbibe the necessary skills among the students. This paper addresses the challenges and issues related to the field of higher education while developing skills among graduate students. The primary objective is to make the students job-ready on day one, but the long-term goal is to enable the graduates to contribute to the success of the organizations where they work or which they create, leading to the welfare of society. Educationists must clearly understand the challenges and issues and develop the curriculum and other academic activities to imbibe those skills as demanded by the user systems. This paper illustrates the skill requirements in the current context and exposes the difficulties and challenges facing higher education institutes. Using the frameworks developed by several countries and following the best practices, the paper culminates in solutions and recommends an action plan.

KEYWORDS

Critical thinking, Industry-linked projects, Performance, Productivity, Social setting

INTRODUCTION

Higher education institutions play a crucial role in developing professional skills among graduate students. These institutions provide students with a structured learning environment, access to expert faculty and resources, and opportunities to engage in experiential learning activities. Quite often, the degree offered by these institutions (HEIs) prove to be terminal degrees for most students. Naturally, these graduates look toward opportunities to start and establish their careers, although a smaller number of them may continue their family business or opt for setting up their enterprises. Regardless of the path chosen, it is essential that these graduates possess a minimum set of skills, which would enable them to succeed in their professional life.

Considering the changes occurring regularly in the industries and corporate world, it is obvious that people selected to work in these organizations should possess the necessary skills to meet the company's objectives. The graduates who desire to become employable expect higher education institutions to equip them with the skills demanded by the industries. With this background, the present paper sets the objectives as follows:

a) Finding out the skills to be acquired by the graduates, particularly those coming out fresh from higher education institutions, (HEIs).

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b) Trying to create a common agreement or consensus as to what these skills mean and how to train the students to meet those expectations from the industries

c) Critically examining the issues and challenges in the HEIs in accomplishing the skills-related aspirations.

d) Developing solutions to provide a learning environment in the HEIs that result in ingesting those skills as demanded by industries and the corporate world.

Next, the paper proceeds with the relevant literature review and uses empirical research methodology to dissect the issues and develop solutions. The points addressed are more related to management education but nonetheless applicable to HEIs imparting graduate and post-graduate education in general. Later critical analysis of the issues and challenges is carried out, followed by discussion and conclusions. Based on the studies, recommendations are provided at the end, followed by references citing the sources.

REVIEW OF LITERATURE

One of the primary ways higher education institutions develop professional skills among graduate students is through academic coursework. Graduate programs typically include courses that are designed to provide students with the necessary theoretical and practical knowledge to succeed in their chosen fields. These courses may focus on specific technical skills or broader skills like critical thinking, communication, and problem-solving.

Higher education institutions also offer students access to career services, which can help students develop a range of professional skills such as networking, interviewing, and resume writing. Career services may also provide students with opportunities to engage in internships or other experiential learning activities that allow them to gain practical experience in their chosen fields. The context-oriented climate in which business works is in steady transition because of computerization and globalization, which has implications for graduate employability (Mohamed & Lashine, 2003). Hence, a prescriptive list of skills applicable across all industries or businesses tends to be elusive. But some skills like interpersonal and managerial skills, which include self-management, communication, team development, conflict resolution, and motivation, are in constant demand in the user systems (Beenen & Pichler, 2016). Besides, problem-solving, the ability to work with others, ethics, and integrity, are the most preferred skills among management graduates (Barrie, 2006). Although there might be disagreements about the skills not matching with the jobs in different industries (Lichy & Khvatova, 2019), the HEIs need to strive hard to imbibe these skills through a variety of interventions and ensure their graduates are “employable” at the time of recruitment (Jonck & Minnaar, 2015)

Industries and businesses see the obligation regarding the improvement of such abilities lying with educational institutions (Cassidy, 2006). This obviously puts the onus on the HEIs to incorporate such learning and training opportunities in their academic programs to meet the employers’ expectations. If skills required by the industries are well known or clearly defined, then the skill development among the graduates can be tackled in a better way. But, there is a lack of commonly agreed definitions of these skills and thus interpretations could vary among educators and industries (Rubin & Dierdorff, 2009). Therefore, practitioners and educators must have precise definitions or consensus before embarking on any initiative to imbibe the required skills. Since the primary aim of the graduates is employability, the HEIs should understand what the industry and the corporate leaders expect as skills among the graduates in different functional areas (GMAC, 2019).

Skills vary across job categories and hierarchical levels in an organization. Further, today's employees are expected to work in different environments which cross geographical boundaries. While earlier multilinguistic abilities were considered sufficient in such situations, now skills like "Deep Learning through focusing on the Global Competencies- 6Cs" are considered essential, which include the following ("The 6 Global Competencies", 2022):

i. Character – Personal attributes of the individuals to be successful in a complicated world like coarseness, tirelessness, constancy, strength, unwavering quality, and genuineness.

ii. Citizenship - Thinking like worldwide residents, to tackle complex issues that influence human and ecological supportability.

iii. Collaboration – the ability to work reliantly and synergistically in group-related abilities including powerful administration of group elements, pursuing considerable choices together, and gaining from and adding to the learning of others.

iv. Communication – The ability to convey ideas, thoughts, comments, and any other form of sending data and information to others in verbal, and non-verbal ways using conventional as well the digital systems.

v. Creativity – The ability to generate new ideas, methods, and systems, and to think differently to develop solutions.

vi. Critical Thinking - Basically assessing data and contentions, seeing examples and associations, developing significant information, and applying it in real-life situations.

The above qualities are listed as employability skills necessary to make the candidates eligible for global placements during the recruitment process. However, abilities designated as desirable inside the expression "employability abilities" are quickly turning into a necessity for work across the world (Unit, 2015).

Different industries have suggested or identified the required skills expected by them when hiring candidates. However, the U.S. Department of Education incorporated the "Employability Abilities Structure" and created related instruments, media, and assets, which are quite comprehensive and well-articulated (PCRN: Perkins Collaborative Resource Network). This is illustrated in Table 1. Under this classification, 26 skills under five major skill categories related to employability have been identified which cover all the essential requirements to succeed in any career.

Table 1: "Employability Skills" listed by the US Department of Education

No.	Skill category	Skill set
1	Applied academic skills	a) Reading b) Writing c) Math strategies d) Scientific principles
2	Critical thinking skills	a) Creative thinking b) Problem-solving c) Reasoning d) Decision making e) Planning f) Organizing
3	Interpersonal skills	a) Teamwork b) Leadership c) Negotiation d) Respecting differences e) Handling negative responses
4	Personal skills	a) Responsibility b) Honesty and integrity c) Willingness to learn d) Flexibility e) Positive attitude f) Absorbing criticism
5	Workspace skills	a) Time management b) Resource management c) Materials management d) Technology management e) Communication

Factors that influence employability among graduates from different perspectives (Malhotra, Iyer, & Dave, 2022), include the learning environment and such factors as the social and economic background of

the students, accessibility to facilities, alignment of pedagogy with the industry requirements, teacher-learner relationship, and the individual's own motivation and self-learning abilities. It is important to note that changes in technology demand new types of skills. For example, the global trend toward electric vehicles (EV) has led to a demand for EV-related skills, like expertise in battery technology. Hence, any skill-building initiative needs to investigate these factors before embarking on skill development programs.

ISSUES CONCERNING SKILLS AND IMPROVING EMPLOYABILITY

Higher education institutions also provide students with opportunities to learn and improve outside the classroom. Faculty members serve as mentors and provide guidance on how to develop specific professional skills. Students may also have access to resources like libraries, research centers, and workshops, which can help them develop technical and research skills.

Traditionally, in the process of teaching, learning, and assessment, the emphasis is on acquiring knowledge and its applications along with imparting some generic skills among the students. However, given the huge diversity of industry and business, it is certainly not possible to develop skills or abilities that would meet the expectations of all stakeholders. As a result, HEIs focused on building generic capabilities so that the graduates subsequently with the help of coaching and training specific to the job, would be able to work as per the expectations of the employers.

Observing this practice, the industries who hire the candidates through the campus selection process, used to conduct a training program consisting of different modules, some general in content, and some with a specific topic, before allotting the regular work to the candidates. This practice of induction training and subsequently upskill training has now become a standard pattern among industries. But on many occasions, the industry and corporate world have expressed their displeasure on the additional investment to be made and the time delay in getting the employees job-ready (Tess, 2017). Even though an understanding is missing on the most proficient method to upgrade employability and who ought to be providing it, all partners, or stakeholders, by and large, acknowledge that scholastic establishments, in a joint effort with industry, can take a few positive drives to build the graduates' employability (Tran, 2015; Yorke & Knight, 2007). HEIs need to acknowledge this responsibility and develop the necessary courses and adopt effective methodologies to impart the skills (Turner, 2014).

Technology with its rapid changes makes the skills acquired obsolete quickly and has a greater impact on the curriculum and the training methods. No doubt there has been a change in the required abilities requested by the market in the last twenty years due to globalization, innovation, and worldwide competitiveness among multi-national companies (Pumphrey & Slater, 2002). These changes have consequently demanded new types of skills to maintain the systems (OECD, 2021). The rise of information and communication technology brought out many new challenges as the new devices were yet to be understood or used, and the candidates needed a steep learning curve to master the new skills. In addition, the lack of experts and trainers severely hampered the process of upskilling.

Quite often enhancing the employability of the students has generally been contemplated as undergoing advanced or higher education, graduate training, special schooling, and internships and projects. These initiatives only partially help to improve employability, and hence HEIs must carry out a comprehensive study of the skills required for employability (Fajaryati et al., 2020).

A CRITICAL ASSESSMENT OF SKILLS

The importance of professional skills cannot be

emphasized enough as it forms the backbone of any successful career. As graduate students ready themselves to enter the professional world, they need to be equipped with not just academic knowledge, but also professional skills that will make them stand out to potential employers. Considering the plethora of skills demanded at different places, and looking at the growing list of skills due to market dynamics, it is first necessary to have a clear understanding of what is meant by "skills", how are they categorized, how they are affected or influenced, and whether any standardization exists. This helps in developing proper frameworks and deployment strategies to bring the desired changes in an organizational context. Along with skills, terms like "abilities", and "competencies", are also used to indicate the required traits or characters that match the demands of the industries.

The demand for skills is not static and keeps changing as per the variations in the job structure, job enlargement, job rotation, and job risks. Hence, at no point in time, skills possessed by a person can be regarded as complete or sufficient. This also makes the issue of skill-related training or coaching, a perpetual requirement in industries and corporate. Hence, the term "life-long learning" was coined to emphasize the learning process through active professional life. Acquiring skills requires periodical investment in resources to bridge the skill gap and becomes an inseparable part of professional life. Recognizing this point, industries typically set up in-house training centers and create a pool of trainers on a regular basis. But it is necessary to understand that motivation and attitude are the prerequisites of successful training in industries (Pellerin, 2009). Further, social setting is also important apart from people's abilities or capacities. Skills succeed only when applied in the proper context, coupled with motivation and attitude, and skills on their own do not bring the desired results. This is very clearly noticed when a team comprising brilliant performers fails to produce satisfactory results.

Soft skills include individual, social, correspondence, and self-administration ways of behaving. They cover a wide range of capacities and characteristics: being mindful, reliable, honest, showing versatility, decisive reasoning, disposition, drive, compassion, certainty, restraint, hierarchical mindfulness, agreeability, impact, and risk-taking (Klaus et al., 2009).

A study of the labor market of the UK, exploring the skill gap and requirements involving 1000 professions, has come out with a taxonomy of skills that will be beneficial to HEIs and other administrators (Popov et al., 2022). A taxonomy or a scientific categorization of skills has numerous purposes, going from the exceptionally broad to the very explicit. These include:

- Viable 'cutting edge' applications like vocation direction (what occupation will suit a specific range of abilities or what abilities are required for specific work);
- Educational program and preparing advancement;
- Giving an outline of abilities under different positions; and
- Figuring out authentic patterns in changing markets and projecting future changes.

An ideal scientific classification for the skills would do the following:

1) It would give an extensive outline of the necessities of a task across all aspects. As a result, instead of distinguishing the clearest and explicit prerequisites of a task, it would set more extensive necessities, giving a better comprehension of abilities.
2) It would permit work prerequisites to be communicated at various degrees of granularity, as they are not similar across various strategic applications.
3) It would identify the level at which a particular ability is required and whether the expertise

required is universal, discretionary, or related exclusively to a subset of occupations.

4) It would connect abilities to capabilities and other work market information. This would show abilities and the related monetary returns.

5) By and large, it would catch more extensive data on the supply of abilities, remembering the work categories and information available about the work.

6) It would be refreshed consistently to identify the developing abilities as prerequisites in existing occupations and to describe the prerequisites for new occupations.

Several countries have developed a skill taxonomy considering the job market, labor workforce available, socio-economic factors, and the creation of new jobs. This exercise is done more to assess the abilities required to perform various jobs adequately and to structure the wages payable to the different levels of the workforce. Finally, this enables improvement in productivity and contributes to the economy.

Some of the taxonomies of skills are as follows (OECD, 2021; Popov et al., 2022):

1) O*NET is a US-based framework that measures, for every occupation, the significance of various abilities and capacities. The framework estimates work prerequisites concerning 177 distinct components, covering around 1,000 occupations. O*NET was first distributed in 1998 and is deeply grounded in research contributed by experts and practitioners.

2) The European Abilities, Capabilities, Capabilities, and Occupations (ESCO) is a European Commission project, first distributed in 2017. ESCO has separate 'support points' for sorting and connecting occupations, abilities, and capabilities. Like O*NET, it draws on work assessment master input. In any case, the abilities are estimated at an elevated degree of granularity, with around 13,500 distinct abilities showing up in a staggered order usable by the industries.

3) Nesta abilities scientific categorization is determined utilizing a 'diagram bunching' examination of online work adverts in the UK, with abilities that show up in similar adverts being put in a similar group. Like ESCO, the Nesta scientific classification has numerous abilities (10,500), which are coordinated in a staggered ordered progression, likewise giving this a granular accentuation.

4) The Skills Framework for the Information Age (SFIA) is a skill system that depicts the abilities of computerized occupations. It is occasionally refreshed by area specialists and just covers advanced abilities. As an illustration, definite planning for Saudi Arabia has been created, which joins abilities to occupation codes.

5) The Singapore Abilities Scientific classification (SST) is inferred utilizing brain network examination of abilities system documentation. This is like the Nesta UK scientific classification in structure however enjoys the benefit of not depending on opening information, consequently staying away from representativeness or completeness.

6) Canada Abilities and Capabilities Scientific categorization is a framework, that draws on O*NET and public abilities systems, outlining a methodology.

It is strongly suggested to develop a skill taxonomy to identify and define the skills required at different professions, levels, and positions. In this context, it is better to check the following:

1) Could the scientific classification at any point give a more itemized description of abilities to supplant or supplement those in other taxonomies?

2) Does the scientific classification empower the planning of abilities to the required level?

3) Does the scientific classification offer the

possibility to consolidate new occupations, abilities, and advancements?

4) Does the scientific classification provide a framework for catching the explicit abilities currently lacking in the existing systems?

Positive responses to these questions would lead to better solutions in developing the skills.

TOWARDS SOLUTIONS – THE WAY AHEAD

It is reported in the literature that there are various methods to achieve a fruitful education of employability abilities. These incorporate the educational strategy, educator's credits, the consideration of expertise procurement, students' contribution and involvement, applicable setting, and accepting liability and independence on the part of the students (Cassidy, 2006).

A commonly administered way of assessment of progress in learning and improvement of skills is peer assessment, in which the students participate in the assessment process. Peer assessment has been advocated as a way of monitoring and assessing employability skills during the process of learning in graduate programs (Falchikov & Goldfinch, 2000; Kollar & Fischer, 2010). Another dimension is to take care of the differences in graduates coming out of HEIs in developed and developing countries because social status significantly affects the candidates' ability to acquire the skills demanded by the industries (Hossain et al., 2020).

One immediate question to be answered is how to decide upon the skills required and how to assess the same. For this purpose, frameworks for the assessment of literacy, numeracy, and adaptive problem-solving, each consisting of around 80 items (OECD, 2021), can be consulted, as they provide a comprehensive definition and the way the skill assessment is conducted. This elaborate assessment system gives a clear picture of what needs to be assessed as the skills that are in general demand across the world. The skills assessed are described in terms of a broad definition, under the following dimensions:

a) Cognitive processes: the psychological cycles that constitute a part of the expertise being referred to.

b) Content: the information, portrayals, and circumstances that comprise the 'object(s)' to which these mental cycles are applied.

c) Contexts: the settings where the expertise is utilized.

Once the assessment concepts are clear in the minds of assessors and practitioners, the students coming from HEIs can be appropriately examined to ascertain their skill levels. In addition to coursework, higher education institutions also offer a wide range of extracurricular programs that help students develop their professional skills. These programs include internships, mentorship, and networking opportunities. Career service centers are another valuable resource for students to develop professional skills. Through these centers, students can gain access to programs on professional development, such as resume writing, interviewing, and job search strategies. Career centers also help connect students with potential employers and prepare them for the job-seeking process.

Successful higher education institutions strive to create programs aimed at providing students with practical experiences. For instance, mentorship programs connect students with professionals in their field and can offer invaluable guidance and advice. Internships help students gain real-world experience in their chosen field while networking events allow for valuable connections and introductions. Other skill-building practices could be arranging regular interactive sessions with experts from the fields, taking up live projects from industries, including short and long terms of internships, and encouraging students to participate in industry-led exhibitions and

conferences.

DISCUSSION AND CONCLUSION

Skill improvement initiatives include school instruction, fundamental expertise development, reinforcing a coach and instructor preparation, filling the skill gap, and developing excellent ability (Hashimoto, 2017). Skilling, reskilling, and upskilling have now become common parlance in India, because of the skill gap as noted by the industries. The Skill India movement initiated by the Government of India envisages imbibing appropriate skills among the youth so that they get a career of their choice, improve the productivity of their workplaces, and thus contribute towards the development of the country (De, 2019). Hence HEIs have the major responsibility of skilling the youth who are undergoing graduate education in various disciplines.

Industry-linked projects have been observed to increase students' employability skills by more than 50 percent, and are highly recommended to improve employability (Cookey, 2020). Traditionally engineering and other professional courses accommodated projects to be carried out by students in an industry on a full-time basis. These projects offer a good opportunity for the students to understand the environment in an industry and simultaneously allow them to solve practical problems, enabling the students to learn through hands-on experience. This practice is adopted by non-technical courses also and is widely appreciated by the stakeholders. Even business school graduates are getting opportunities to tackle managerial issues by doing projects, often as paid internships. This adds value to the students' resumes and enables better compensation during the campus selection process.

This paper has examined the issues, challenges, and the way ahead for establishing the skill requirements, along with the possible adaptation of frameworks already developed by several countries. Some of these frameworks have made elaborate listings of competencies required in terms of the common pillars like qualification, job requirement, granular levels, and minimum mastery expected to perform the jobs satisfactorily.

RECOMMENDATIONS

1) Determine the required level of ability prerequisites in different regions. These actions would be more granular than the components utilized in the given frameworks.

2) Determine the moderate-level measures in a way that are steady with the more extensive classifications contained in the frameworks.

3) Plan between abilities and capabilities across different levels. This approach could recognize the kinds of capabilities common in different occupations.

4) Check updates to scientific categorizations to discover where new occupations are added. This would help to stay up to date with improvements in the scientific circle.

5) Combine the information from different frameworks to throw light on deficiencies inside occupations. This could reveal insight into the idea of deficiencies as far as the particular abilities required for a specific job.

6) Examine whether expansions to past research could give incremental knowledge about different abilities.

7) Establishing a strong collaboration or partnership with professional training and development agencies like the Indian Society for Training and Development. These agencies possess a team of experts in various domains and maintain a database of trainers and coaches, who can be involved in developing skills among the students,

However, higher education institutions also face challenges in developing professional skills among their students. Some students may lack the motivation

to participate in extracurricular programs or view them as optional rather than necessary. Additionally, institutions may struggle to integrate such programs effectively into their curricula. The recommendations given here are not a panacea to solve all skill-related issues but provide clear guidance as to how improvement is possible. Apart from the methods cited from the secondary data, several new methods and approaches are also suggested which deserve attention among educators.

In conclusion, professional skills development is critical to the success of graduate students in their future careers. Higher education institutions play a crucial role in providing these skills and experiences to their students to prepare them for the professional world. By adopting proven best practices, addressing challenges, and leveraging opportunities, institutions can ensure that students leave with career-ready skills that will serve them well for years to come.

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How Best Can We Forecast Safety Culture More Accurately?

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ABSTRACT

Safety culture could predict the incidents rate, but the injury data cannot forecast safety culture. Safety systems believe that safety is the managements' responsibility, but safety culture interventions emphasize that safety is an individuals' role to behave safe and also support others. The big question is, are employees safe at workplaces? Most corporates are not willing or able to decide between the safety enforcements and positive safety culture, as because they are not open to learn about the insights of safety cultures' positive effects on business. It is hard for them to think of safety beyond profits, production and business perspective, until a major fire or fatality like incidents take place that impede their business badly. The corporates cannot take risk of not practicing a positive safety culture strategy and the management action plan. As forecasting mechanisms, it is critical to know also the periodicity aspects of safety culture transformation, and that the behaviour based safety (BBS) 1.0 and 2.0 both together transform the safety culture into a positive work culture. Based on the comprehensive literature reviews and insights from the field practitioners, this paper describes ten stringent measures of forecasting best safety culture more accurately towards achieving vision zero.

KEYWORDS

Organizational culture, Behaviour, Behavioural safety, Workplace, safety culture

INTRODUCTION

Do we want to kill or disable people at work sites, if no, then the organizations essentially need to build and sustain a positive safety culture. Safety culture is an empathy in action at personal level applicable at anyplace. Our workplaces are not safe until everyone is active in correcting unsafe behaviours. If our organizational leaders do not choose to make a planned change in their safety culture, any employee is likely to be affected by the incidents. Safety communications by managers was the leading predictor of safety culture, as well as developing training modules to facilitate managers to understand their roles (Tsung, et al. 2010). Positive safety culture is a real-time intervention that provides measurable outcomes, transformational work experiences, activated leadership, empowered employees (ILO, 2017).

The 1986 Chernobyl disaster was the result of a reactor design error, at-risk behaviours of the plant operators, resulting in lack of a proactive safety culture (World Nuclear Association, 2022). Research and professional experiences indicate that when safety culture is robust, incidents are rare and less severe.

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A positive and supportive safety culture is effected by many practices such as: managers committed to safety, open communication across the company, employees personal responsibility for safety, organisations' continuous learning, safety conscious work environment, well-defined and non-punitive reporting procedure, balancing safety priorities and deadlines, mutual trust between employees and the management, fair and just response to safety concerns, training and resources support (U.S. Department of Transportation, 2017).

Safety culture remains an undefined and incalculable phenomenon, until and unless there are free and frank discussions on safety issues across the organization. More the safety culture is discussed over a long period of time by most employees, more it gets defined and calculated. Fortunately, the positive safety culture, and not the traditional injury data shapes the future (Long, 2014) for reducing incidents in daily life, but it is difficult to remove all accidents (Małysa, 2022).

But there is also a flip side to safety cultures. The predictive strength of safety culture evaluations is questioned and debated for future safety outcomes and subsequent criticality of incidents (Boskeljon-Horst et al., 2022). Hence, more than assessments, real time safety would depend upon how each person is active for the workplace surroundings each time.

Forecasting Safety Culture More Accurately

The clear picture of safety culture forecasting is possible only when organizations are able to act with regard to each of the series of measures for best safety culture being implemented accurately under the guidance of a team of safety culture experts. The risk that corporates cannot take, is not practicing a positive safety culture strategy and an action plan. You are safe just for now. How can we forecast safety culture more accurately? Table 1 describes 10 stringent measures of forecasting best safety culture more accurately. Whereas each of these measures directly or indirectly impact the success of safety culture, but largely the change is achievable depending upon how long the focus is maintained by the employees. Policy

revisions, regular management development and safety training programs are the essential elements that would contribute to zeroing human errors (Mahsoon et al., 2021).

Table 1: Stringent Measures of Forecasting Best Safety Culture More Accurately

1.	Everyone is trained in caring behaviours as safety culture observer.
2.	Everyone is an active observer for spot-correcting at-risk behaviours.
3.	Continuous safety culture retraining for observations.
4.	Daily accounting of at-risk behaviours.
5.	Daily spot-corrections of barriers/hazards in safety.
6.	Achieving a standard of zero at-risk behaviour and vision zero.
7.	How often are the at-risk behaviours out-of-view of the supervisors/ observers?
8.	Are there any work areas that are out-of-view of the observers?
9.	Safety culture is monitored by the corporate board and is linked to HSE index.
10.	Did safe behaviour learned from workplaces transfer to home and other arenas?
To calculate forecasting: each measure carry 10 score multiplied by 10 = 100 total score	

Most industries do not fulfil these measures of forecasting best safety culture more accurately, even after years of safety culture interventions as continued focus gets disappeared. On the contrary, the effectiveness of positive safety culture initiatives can sustain for many years (Spigener et al. 2022).

Let us explain these ten stringent measures of forecasting best safety culture more accurately for better understanding as below.

1. Everyone is trained in caring behaviours as safety culture observer. Organisations assume that implementing a safety culture process would

ensure that employees would take a proactive action to correct an at-risk behaviour, which may not be the case. Besides safety behaviour observations, conversations among the workers about at-risk behaviour are important (Geller, 2018). Also, the observers need to be reinforced for accountability and rewards for their observations. Safety culture is considered as a step towards building a caring culture for safety of each other (Ellis et al., 2022).

2. Everyone is an active observer for spot-correcting at-risk behaviours. But most workers may not actively care. However, they wish that no one should get hurt or injured, for which they should find time to check around, if anyone is at risk, whom they could save with their proactive efforts (Geller, 2018).

3. Continuous safety culture retraining for observations. Research indicates that an incident and injury at worksites are the result of workers' behaviour and safety culture. The development of safety culture in the industry through leadership and training roles will provide a safe working environment (Misnan et al., 2008). Training staff on appropriate safety behaviours and requiring them to complete safety observations helps keep safety a priority and continuously reinforces the facility's commitment to incident prevention (Pritchard, 2022).

4. Daily accounting of at-risk behaviours through co-creating more quality-oriented and safety-related interactions improved the safety performance, changed trends in injury rates and an improvement in safety culture was noticed (Nielsen, 2014). Organisations must involve employees at all levels for creating a system perspective about the at-risk behaviours (Aulin et al., 2019).

5. Daily spot-corrections of barriers/hazards in safety. There are the four categories associated with safety barriers: (1) Behaviour Barriers; (2) Management Barriers; (3) Awareness Barriers; and (4) Culture Barriers. Most frequently happening barriers include the inadequate safety training, half-hearted commitment, high work pressure, deadlines, insufficient experience and knowledge. The actual safety of the projects should be focused on to reduce injuries, accidents, and reduce barriers of applying safety, which will enhance the sustainability and development of safe environments within industry (Maliha et al., 2021). Eliminating fatalities and serious injuries is the main challenge for the global industry. Focus is to provide the industry with actionable recommendations and guidance to create safer and healthier workplaces (World Steel Association, 2022).

6. Achieving a standard of zero at-risk behaviour. The understanding of health, safety and environment (HSE) issues among workers and that of the evaluators is different. Often, when workers identify a situation as low-risk or even zero-risk, the evaluator assesses the same context as maximum risk (Carpio-de et al., 2021). Also, there is a need to allow more time for managers and workers to talk about safety issues (Quenon *et al.* 2020) in order to achieve zero at-risk behaviour.

7. How often are the at-risk behaviours out-of-view of the supervisors/observers? The supervision/ observation of the at-risk behaviours provide challenges for safety culture improvement as it involves adequate time for interactions, discussion and toolbox talks for understanding issues to be rectified (Bayley et al. 2022). At the same time, daily abusive supervision negatively affects organizational citizenship behaviour for the positive safety environment (Wang & Xiao. 2022).

8. Are there any work areas that are out-of-view of the observers? Research reported that people who perceive it to be normal, overlook

procedures and take risks as well (Mark et al., 2020). To prevent such practices, the frontline engineers reinforced the safety implementation by interactions, conveying expectations and support which can inform the safe practices (Bunger et al. 2019).

9. Safety culture is monitored by the corporate board and is linked to the work culture. The psychosocial hazards (such as work culture, relationships, stress, decision making process, work organization) fully mediate the relationship between safety culture and the organizational safety performance (Naji et al., 2021). Safety culture sustains as an integral part of the organizational culture (Paoletta, 2020). It is difficult, until and unless the company directors want to end and fix the safety culture challenges.
10. Did safe behaviour learned from workplaces transfer to home and other arenas? It requires families' interactions on safety about the risks that involves their kins. Also, how actively the employees are able to reduce risks at home environment for their family members and their neighborhood's in promoting safe behaviours. Workers who practice safe behaviours at workplace do not mostly perform the same at their residences. Yet people tend to assume that safe work practices are extended to home and social settings are an indicator that safety culture is deeply rooted (Balzer, 2015).

An example of a Case of Sterlite Technologies Limited (STL)

The case below would help understand salient measures of positive safety culture.

Due to safety culture implementation and the steering committee meetings being conducted, the workforce feel free to ask questions without fear, and help in correcting rather than criticising at-risk behaviors. Behavioural science approach enhanced the positive safety culture of an organisation and reduced incident related losses.

Month-wise data here below indicate that the at-risk behaviours reduced from 24 to 10 percent over a period of six months.

Month	Safe Behaviours	At-risk Behaviors
October '21.	76%	24%
November '21.	87%	13%
December '21.	88%	12%
January'22	88%	12%
Feb'22.	89%	11%
March'22.	89%	10%

- Approach adopted by STL management:
- Active participation from all including subcontractor workforce, business head, departmental head, front line managers, engineers, supervisors and workers.
- Empowering and making everyone responsible for their own and team safety.
- Observation and counseling with due respect as a part of organization core value.
- Team leader performance evaluation based on individual performance with respect to process implementation.
- Adherence of transparency in EHS communication.
- Continue observations till reach the safe behavior and learns the concept of self-observation and observing others for safe operations.

Review of safety culture processes checklist for STL sites as below:

Mark each process below out of 10. Check, what's lacking.

1. Safety cultural change - Followed

2. Leadership increased involvement: Followed

3. Monthly BBS meetings - Followed

4. Incidents reduction - Followed

5. Behavioral trends improvement - Followed

6. Sharing of at-risk behaviours during TBT - Followed

7. Motivational reward, recognition for observers/ units - Followed

8. Managements regular observation rounds - Followed

9. Regular safety awareness - Followed

10. Periodical reviews - Followed

Total score: 10x10= 100,

STL score: 100%

The change in positive safety culture happens over the years and its sustainability need to be constantly explored. The management should continuously monitor and evaluate their strategies while delivering multifaceted interventions to be more specifically focused and to motivate workers to be enthusiastic in sustaining safety culture (Wong et al., 2021). Sembcorp Energy India Limited (SEIL) manages Health, Safety and Environment (HSE) responsibility as its core value (SEIL, 2023a). To further strengthen the safety culture and secure a positive behavioural change within the work place, SEIL has implemented and integrated Behaviour Based Safety into its safety systems across all the assets. ISO 45001:2018 mandates that human competence and behavioural elements need to be considered in risk assessment and as an internal issue for managing risks (SEIL, 2023).

CONCLUSION

The workers' health and safety is paramount which needs improvement. The positive safety culture can result into reduced incidents and related costs (MBIE, 2013). The stringent measures of forecasting best safety culture more accurately as outlined above are critical for implementation and continued follow-ups. Practically, these measures work in combination as they are inter-related to forecast an accuracy of an organizational safety culture. Every organization has a base level of safety culture which needs to be improved further for accurate results and desired outcomes. Safety, health and environment (SHE) are becoming an integral aspect of the company culture as businesses understand that their success depends more than ever on people, and vision zero is a proactive leading indicator. Visualize worker's safety as turning into a safe society (The Vision Zero Summit Japan, 2022).

Most of the safety culture committees in an organization remain non-functional and as a result of which the benefits to the employees are absent. In fact, such professional teams can do wonders if they are active and focused on the objectives for which they are constituted. Some committee members are active initially, others are mostly passive. Actions of these safety management teams predict the strongest relationship to employee's commitment to safety (Cox et al., 2002). The research reports presented how workers perceived their safety but are not able to predict how would this reflect into future (Cole et al., 2013). Moreover, the safety culture can predict the injury data, but Injury data could not forecast safety culture. Safety culture intervention involves all employees in the organizations for positive changes. Supervisors use training inputs as mediator to improve the employees' commitment. Employee commitment has the biggest impact on safety culture satisfaction. Communication directly supports employee commitment (Tappura et al., 2022).

Safety culture is becoming an indispensable forecasting factor in achieving sustainable development (Jasiulewicz-Kaczmarek, 2022). There are ups and downs in organizational safety culture. Consultant driven dependent safety culture without

adequate leadership and self-driven structure slowed down in several organisations. The steering teams in these companies did not function as adequately as in the beginning of safety culture intervention. Later, they had to rejuvenate and support the interventions so that everyone is alert to observe unsafe behaviour on the spot as a standard operating procedure. As safety reporting is made more descriptive, though the observers do the corrections in the field, they hesitate to report as it is time consuming. The risks of poor safety culture include not having an easy-to-understand system for managing safety can increase costs significantly (ROSS, 2019). Moreover, it is easy to find fault, but it is easier to provide care, as a basic principle of positive safety perspective. Most companies suffered fatalities, losses of property over the years, much before launching safety culture intervention, as they followed the blaming and fault finding - reactive safety culture loaded with hierarchies. The important cause of safety incidents is related to human factors/errors and fear of blame, indicating the concerns of the psychologically just culture, which need to be understood and addressed (Shabani et al., 2019).

Safety systems could give safety climate, but not the safety culture. Safety culture enhances safety behaviours. Some organizations customise their safety culture intervention bypassing its core principles, which can prove to be risky in terms of real time safety performance. Managements' sincere sympathy for employee's safety is a precondition for safety culture implementation. The first few months of implementation initiate safety climate, but it takes continued efforts for building safety culture resulting in an expected levels of increased compliances and significantly reduced incidents towards achieving vision zero. Companies who implement Zero Accident Vision has an ambition that all accidents are preventable, and they achieve it by safety communications, culture, commitment, and learning (Zwetsloot et al., 2017). A Vision Zero Norway city Oslo had zero road incidents (Short 2020). Vision Zero action plan implementation consider the ethics and value of human life (Safarpour et al., 2022), and how quick the organizations are in decision making and utilise their safety resources. Most organizations move slow in deciding matters on safety culture goals due to lack of accurate guidance and mentoring. Safety culture areas of improvement should be prioritised and immediately tackled, and strengths of safety culture should be maintained (Mrayyan, 2022). The safety culture interventions prevented safety incidents, supported learning about the safe future and enabled the safety and health care (Finn et al., 2022).

Every moment is a safety moment and an observation time, or it can be a moment of an incident, as risk is live anytime anywhere. It requires managements' will, motivation of employees, and meaningfulness of safe work to everyone to personalize safety culture. Forecasting best safety culture accurately is an integral and persistent to any work culture.

As forecasting mechanisms, it is critical to know the periodicity aspects of safety culture transformation, and that the behaviour based safety (BBS) 1.0 and 2.0 both together transform the safety culture into a positive work culture. The periodicity of safety cultural change would vary and depend upon size of the organisation, existing culture, leadership and so on.

The periodicity of the positive safety culture transformation is an important forecasting mechanism at sites which reveals (Table 2) that during the first six months, there is about 20 percent change in the company's safety culture in terms of reporting and participation, though the awareness and training is most likely 80 percent completed. Dependent safety culture prevails as mostly HSE officers take ownership.

Table 2: Periodicity of Positive Safety Culture Features and Transformation

	1st six months	2nd six months	3rd six months	4th six months
1.	Conceptual Awareness	Training/re-training/Tool Box Talk (TBT)	Mass-communications	Reverse TBT
2.	Reactive safety culture	Dependent safety culture	Independent safety culture	Interdependent safety culture
3.	HSE drive	Steering teams drive	HODs drive	Sites drive
4.	Employees involvement	Contractors workmen	Office staff	Families
5.	Correction based	Conversations	Care	Connect
6.	Formal Reviews	Critical Reviews	Directors Reviews	Site Reviews
7.	Quantitative analysis	Qualitative analysis	Barriers rectifications	Resources Provision
8.	Observations driven	Data driven	Performance driven	Core Value
9.	Safety systems activation	Behavioural safety	Psychological safety	Human factors/ human error/ cultural safety
10.	Reporting Participation 20%	Reporting Participation 50%	Reporting Participation 70%	Reporting Participation 90-100%

The steering teams at head office and regional offices are not taking ownership as they don't demand or enquire safety reporting from the sites. Thus, despite, safety culture trainings, there is only 20 percent reporting by employees. Moreover, behavioural corrections by observers at sites don't necessarily entail conversations for imbibing safe behaviours. The disconnect between managers and observers remain. The employees need to talk everyday about safety observations which can happen only when safety is performance-based, and managers stress it daily during their site rounds (Kaila, 2022).

It is good to note that behaviour based safety (BBS) 1.0 and 2.0 both together transform the safety culture into a positive work culture. BBS 2.0 focuses more on organisational culture factors, rather individual behaviour. BBS 1.0 is observational in nature, whereas BBS 2.0 is more conversational for developing response mechanisms to combat multi-faceted organisational barriers while evaluating accountability of leaders for leading the positive safety culture intervention as a long-term roadmap for businesses. Table 3 describes how BBS 2.0 is implemented qualitatively and conversationally at organisational levels for establishing safety dialogues across the board from topmost level to down-most/ last person. It is important to fix accountability of each of the BBS steering teams leaders, and to understand that BBS 2.0 does not replace BBS 1.0 but both are complementary to each other (Lal, 2023).

Table 3: Basic difference between BBS 1.0 & 2.0

	Culture building - Broad Focus of BBS 1.0 is on:	**Perspective building - Focus of BBS 2.0 is on:**
1.	Observations and corrections	Increased open and empathic conversations across levels, critical reviews, mass-communications
2.	Employees as observers at all levels/areas	Integrating contractors, customers, stakeholders
3.	Individual Behaviours	Organisational barriers/antecedents, resources provision
4.	Corporate Steering teams	MD level, Board of Directors reporting, Challenge management's passionate involvement
5.	Behavioural safety culture	Total safety culture: Psychological safety, human factors, human error, cultural safety, digitalising, integration
6.	Steering teams commitment for months/years	Accountability evaluation of leaders/managers, performance & policy based commitment for long-term

7.	Actively caring with empathy	HSE as core value and zero-harm, corporate rewards and reinforcements (digital and non-digital)
8.	Quantitative score-board/ measurement	Qualitative Site steering team/ HODs monitoring
9.	Safety and business perspective	Health, Safety, Environment, Well-being, Sustainability
10.	Monthly monitoring and recognitions	Weekly monitoring and spot-rewards at sites

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Impact of Artificial Intelligence Tools on Recruitment Process

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ABSTRACT

This chapter reviews practices in the field of recruitment and how they are impacted by automation tools. Practices cover various steps like sharing of job profiles, resume screening, face to face interviews, to identify the right candidate. Today's job portals offer different levels of automation for various steps. Automated tools have been known to render benefits to companies that recruit in large numbers. On the other hand, companies are also struggling with quality of candidates hired and how to retain them. Whether such automated tools lead to hiring of quality talent is a moot point. This article looks at what is required to make the "right" selection decision and suggests a direction for artificial intelligence to help hire "right".

KEYWORDS

Recruitment, Machine Learning, Technical Interface, Behaviour, Retention

INTRODUCTION

In their book "*The Talent Masters*", Bill Conaty & Ram Charan (2011) wrote that the difference between the companies that survive and those that don't is determined by the people who lead such companies. Leaders make all the difference. Good leaders make their teams feel energized and engaged with their vision providing the glue. Human Resource Management plays a very critical role by providing the right people for the leader's success or as the two authors put it, "a steady, and self- renewing team of leaders". This does not happen by design. An organization that aspires to have such leaders' needs to first have the "right" talent or hire people with leadership potential. That's where it starts. Not just for leaders even for other positions. It is important for both the hiring manager and the leader to know how to hire "right".

While recruitment is the broader term referring to the process which contribution to the business, hiring is the word used in everyday parlance. The **process** encompasses the voluminous resumes or Curriculum Vitae's (CVs) to be screened, candidates to be interviewed, and documented (Refer figure 1). The process filters out candidates who are not "right", as per company's defined expectations, which consists largely of Competencies required for the job. These are characteristics which are visible in the form of Motivation, Traits, Self-Concept, Knowledge (education) and Skills (KSA) (Spencer, 1993). Components have changed over the years with Attitude / Attribute becoming more popular terms in recent times. Personal interactions (interviews)

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are the favored mode for assessing competencies as **Behavior.** The business problem we are trying to solve here is **Retention** i.e., who will stay and contribute to the organization. **Culture** has critical impact on retention.

As a Human Resource Consultant recruiting is an essential activity for me to step in to deliver value to a client. Since portals are the favored source for generating CVs, I end up using them on a daily basis. In the past 3 to 4 years I have been noticing that it takes longer to fulfil a client's requirement because there are more resumes to screen, more portals to approach, to find quality resumes aka good candidates.

Data analysis procedures

Based on a survey carried out by Career Builder in 2017 which reported that three out of four employers hired the wrong person for the job. Even more surprising was the fact that one third of the companies had made assumptions about candidate's skills, attitude, and qualifications. The same survey mentions the cost of a bad hire at approximately $15000 excluding loss due to non-performance.

This at a time when hiring is big business. As an industry it generated over Euro 400 billion in revenues worldwide (2017). Most often selection decision is made by a senior person, it behooves a leader to know how to hire "right".

Specific problem of the study

Today with technological Artificial Intelligence (AI) and Machine Learning (ML) based tools automating the recruitment function, efficiency and hassle-free functioning have become common portal features. According to Susan Poser and Sharad Sinha, Machine Learning has made possible larger candidate database, faster screening, and reviewing thousands of applications, engage with candidates using chat bots. Besides sourcing, such tools are using learning algorithms to update industry relevant skills to improve matching of skills mentioned on CVs. Online video interviews have made face to face interviews redundant; automated recruitment process has crunched processing time. Job portals are incorporating AI into their algorithms to improve resume shortlisting / search results on their search engines.

Technology companies like Cognizant, Tech Mahindra and Cap Gemini who screen tens of thousands of candidates every year, use a mix of technologies such as AI, natural language processing and machine learning to reduce time and cost of processing. However, the jury is still out on whether Technology Intervention in hiring has led to better selection decisions.

Theoretical foundations of the study

Here is a diagrammatic representation of a typical recruitment process.

Figure 01
RECRUITMENT PROCESS

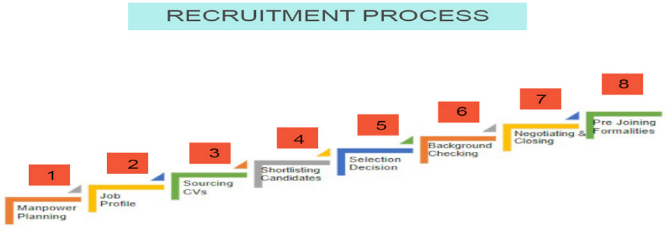


Figure 1: Recruitment Process

Step 1 - Manpower Planning is a business planning process.

Step 2 – is one of the conceptual pillars of Human Resource Management. A **Job Profile** is derived from a job description (JD) which is a slice of the

Organization's Architecture. It is linked to the Vision of the entrepreneur, is key to business execution and determines reporting hierarchy. A lot of thought goes into it. Manpower experts with industry knowledge observe job related activities, film actual activities. It is an exact science where performance experts engineer the job and scale performance standards for the job. These parameters make the Job an identifiable unit of operations / administration. A well-prepared Job description is the foundation stone of good hiring practices. The Job Profile (JP) on the other hand is a listing of Knowledge, Skills, and Attributes (KSAs), to enable communication between all stakeholders.

In an Assessment center we conducted for Owens Corning India Ltd. (OCIL) in 1997 when they were setting up a state-of-the-art plant in Taloja, Maharashtra (India). We had to hire 250 Fresh Technical diploma holders. The client was very specific about the three competencies that they were looking for. And excellent communication was one of them. Spoken English had to be minus an accent as teams would be speaking frequently to their bosses based abroad. Because their requirement was so specific, we were focusing mainly on our selection process refining it to make it flawless. This was pre portal era so we advertised in a major daily in the initial phase. Since it was summer vacation time, we received only a few hundred responses. Thus we had to advertise in local newspapers in all major cities wherever there were engineering colleges, to increase response rate. As we refined our reach, applications started pouring in. Word started spreading through word of mouth. We ended up receiving almost a hundred thousand applications and succeeded in giving 250 diploma holders to OCIL, in time to start the plant.

There were two learnings which stayed with me as a consequence of this project. 1) Be specific about Competencies – the knowledge, skills, attribute which add up to form the competency (KSAs), and 2) make sure you have at least 50 to 60 relevant CVs in pipeline for every one person to be hired. With senior level positions and industry this ratio will vary.

Job Profiles are a critical connect between portals which have their own mathematical logic for shortlisting; while stakeholders of the job will be evaluating candidates based on behavioral attributes. Competencies are scaled using behavioral indicators of performance as behavior has direct consequences on job performance.

Step 3 is contacting candidates using portal features. Depending on the portal's reach, candidates respond by sending their Curriculum Vitae (CV). Today's businesses being time sensitive job portals are time effective tools to gather relevant CVs. On a company's behalf they scout for "right" talent and reduce workload.

No doubt entry of job portals on recruitment scene was a game changer because it solved a real business problem – widening candidate pool globally. However, they are built on the assumption that active candidates are best candidates which may not always be the case. Especially in these times when newer technologies are emerging "right" is a judgment of the person taking final selection decision.

Step 4 Shortlisting is an activity-based step involving communicating with candidates. Job requirements are explained in a way candidates understand through phone, emails or face to face exchange. "Intelligent" technology used here ensures those not meeting listed criteria are eliminated from the process. Qualification is one criterion used to filter out at this stage. Those clearing this round are further assessed during technical rounds and background check.

Step 5 Interviewing is a must have leadership skill. If leaders could interview correctly, they would never have to do a day's work in their career. This is a

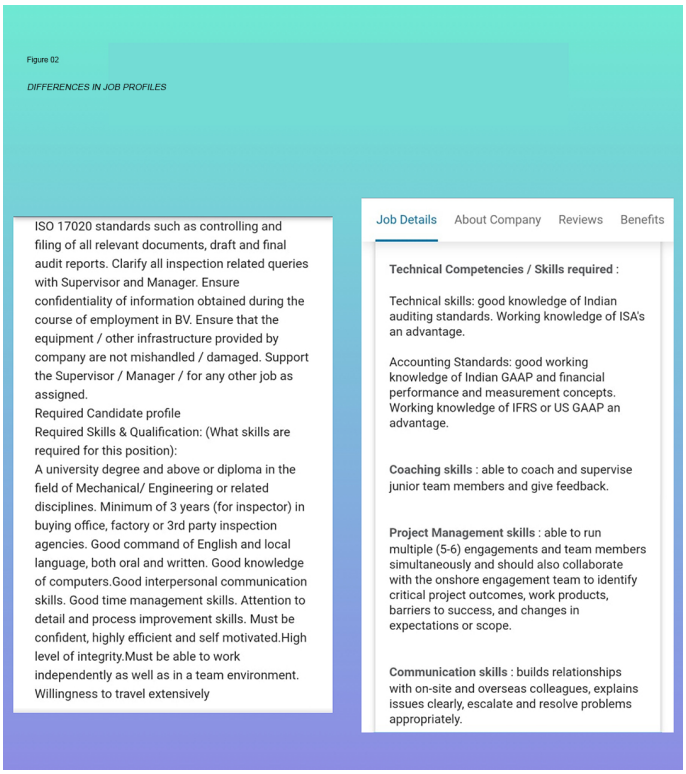
critical step where information, or evidence in Lou Adler's terminology, is gathered through face-to-face interviews. Interviewing is a sub process which results in a selection decision. Companies use technical / panel interviews, aptitude, personality, work tests or psychometrics, simulations and/ or assessment centers to gather relevant data. Most IT companies rely on a logical reasoning or Aptitude test to do the heavy lifting, followed by an interview with product head and human resources, to check cultural fitment. Gaming and Simulations too have been used by some companies to gather intelligence. Interviewers observe actual behavior (candidates') to gauge skills, knowledge and attributes. Computational power becomes immaterial here. The more detailed the observations, the better is the matching and thus selection decision.

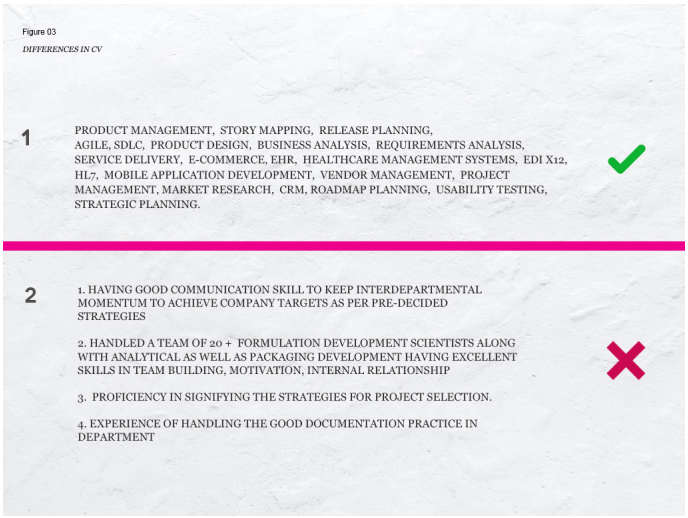
Step 6 is an internal documentation process while step 7 is driven by demand and supply of talent.

Step 8 is hand holding to ensure there is no slip between the cup and the lip. Whether senior or junior constant communication builds engagement, allays their pre- joining doubts. Once they join an employee's tenure is determined by experiencing first three months - induction, leadership, culture, team meetings, company's policies and career growth. This has nothing to do with recruitment software used and everything to do with company's culture.

Overall research design and methods

How does recruitment process translate into action on the field? Here is a snapshot.





CONCLUSION

Automation is not knowledge

Job Profiles are critical to candidate filtering. How exactly the words profile the job, determines how relevant are candidates' resumes. The intention should be to generate as many as possible. If quantity is less there will always be a chance that no candidate reaches final stage or recruiter will feel "we could

have got better" candidates. Quantity means you can make a choice and quality means there is fitment as close to 100% as possible. For very specific skills perhaps even four to five CVs are good enough but such kind of positions are few. During a quick look at open job postings on some well-known job portals, I found that:

- Detailed description of duties, responsibilities, and accountabilities heightens chances of generating more CVs.
- Attributes were generic.
- Clarifying categories like Industry, Skills etc. make jobs easy to search on portals.
- Besides simplicity of the language, specificity of information asked for, presentation quality, there is a whole new science called Key Words which enhances search results.

I find that computational power is material to software to complete clerical tasks faster and more accurately. The objective of any AI model is its computing power while hiring is about behaviors and job performance. Just because an activity is carried out by a software does not make it "intelligent". Intelligence is a cognitive process, while matching of CVs is a visual process. On the surface it doesn't seem to refer to any cognitive model. In the real world of skill, visual matching requires eye-hand coordination and is a lower skill on the skill spectrum. Even if skill databases may be getting updated, this processing or updating data does not qualify as intelligence.

If data is churned to support a higher level of decision that would be intelligence. Intelligence means superior. If the automated tool gives superior conclusive recommendations related to competencies, behavioral insights and / or cultural of a candidate to support a decision regarding their suitability for the job, that I would call 'intelligent" hiring. Perfecting a definition of intelligent hiring is an idea worth exploring.

Behavioral Foundations of AI

Can a mathematically developed model parameterize behavior in all its categories and develop a universally acceptable scale, given that perception of behavior differs in cultures?

For instance, identifying critical behavioral data points for a Job then capturing behaviors of candidates to recommend or reject the hire will bring hiring decision out of voodoo to a science. After all a company is paying for intelligence not visual matching.

Competencies are observable Behavioral criteria. For leaders it is imperative that they become keen observers of human behavior to assess people more accurately. Assessment centers, Critical Incident interviewing technique, Psychometric tests, throw up behaviors of candidates with fair amount of accuracy, if assessors / interviewer are well trained. Especially for senior, non-manufacturing and jobs requiring innate talent, people management or financial management jobs, the only validation is out of bounds (reference check) for interviewer. Technology can only point out inconsistencies based on norms human beings prescribe. In the absence of testing there is heavy reliance on interviews to assess a candidate's suitability. However, many interview rounds we take fact remains that in absence of physical evidence everything is a perception of the interviewer. And therefore the selection decision is a risk taken on interviewer's experience. I would like to reiterate that in the absence of testing, Attitude is only an affectation and not a substitute for Skills.

What are the conditions in environment (Culture) which prompts people to leave (Behavior)? From a portal standpoint it could be wrong matching of skills, but to get to root of the problem we need to look from company's perspective. Reasons can vary. My experience says Culture is one black box

which needs to be more detailed if we don't want selection decisions to come home to roost. Cultural dissonance is like the naked emperor. Recruiters, whether internal or external vendors can play a vital role by providing **local knowledge** - of a country's unique challenges and candidate's cultural fitment. A software will only give information that has been input-ed by someone but recruiter has "experienced" candidate interpersonally.

Cultural dissonance

i. **Hierarchy** has a bearing on a person's cultural fitment because it explains their response to authority. In a corporate set up hierarchy is denoted in **Reporting structure.** Not only does it vary across countries in nomenclature; for instance, in US a Vice President (VP) is one of the senior most designations, while in India a Vice President is a departmental head. Hierarchy means control and communication authority. In a paternalistic country culture leader's behavior can be considered condescending by an outsider, while in an individualistic culture, egalitarian can be seen as lacking in structure. This sets a huge gap between what a candidate *has behaved* and *is expected* to behave. Most of the time these differences are not evident during interview. These become obvious only after candidate joins. It is up to the leader to understand and exercise an inclusive approach with such candidates. Cultural value check is very critical at the process stage to ensure good selection decisions.

ii. **Cultural Sensitivity** today is becoming more and more important as cultural nuances can make or mar a candidate's tenure with a company. In fact, McBer and Company discovered this when they were approached by U.S. State Department for help in selecting junior officers. They found Cross Cultural Interpersonal Sensitivity critical to selection. Culture dictates what information about her / his experience a candidate shares on resume. Some family oriented cultures like in Middle East or even in southern parts of India talking highly of personal achievement is frowned upon, while in US & in North India a resume is treated like a self-marketing tool. Candidates brought up in former cultures are less verbose than those brought up in latter cultures. After all some company cultures reward verbosity while some look for silent workers. There is no position specific best practice here it is up to the interviewer to put things in perspective. Cultural Sensitivity is hallmark of an emotionally intelligent leader (Goleman, 1998).

IMPLICATIONS FOR SOCIAL CHANGE

Human and technology interface

Behind a CV is a human being who has strengths and developmental areas. A total understanding of human beings is not revealed in its strengths; it is revealed in its limitations! In these limitations lie reasons why the employee left, or reacts under pressure, in a team or different culture, or subverts even the best software (Goleman, 1998). Human Behavior is complex (Skinner, 1965). Language is one medium through which behavior can be deciphered. When Artificial Intelligence has proved incapable of translating scientific documents how can we expect it to capture sensory behavioral data? Selection decisions are an outcome of a cognitive (brain) AND an emotional process. It remains to be seen how a machine can replicate both these dimensions (Russell & Norvig, 2015).

Human Resource Management practices today focus on Talent Acquisition, Management and Development while some of the knowledge on which it is based is a hangover of Industrial revolution especially motivation fundamentals seem to be based on Maslow's Hierarchy of Needs. It was a psychology paper written in 1943. Today individual motivation, learning drives career direction, not need

for money or security. Even Maslow's hierarchy has evolved. It is not uncommon for people to change career three to four times in a lifetime. Their needs have changed and so has any behavior which is goal directed. Management thinkers like Peter Drucker have been emphasizing "A Human is not a Resource", a viewpoint very well-articulated by McGaughey, 2018 in his article.

The real danger about technology is that one tends to get carried away by its ease of use and dazzling UI more than the areas of human knowledge that it opens up. In India candidates still use Google to prepare CVs; it is not taught anywhere – neither school nor College nor professional institutes. According to a report published by LinkedIn Learning data from over 660+ million professionals and 20+ million jobs revealed the 15 most in-demand soft and hard skills of 2020. Among the soft skills are creativity, collaboration, persuasion, and emotional intelligence; and among the hard Blockchain, Cloud Computing, Analytical Reasoning, Artificial Intelligence and UX Design. This augurs well for employment outlook.

This addresses only the input part of AI based HRM. The Output part of the equation needs to come out of the shadow of assumptions and reflect the needs of the field it is being used for, namely the future needs of hiring.

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Investigating the Relationship between Vehicle Operators' Refresher Training Participation, Vehicle Incidents-based Damages and Related Maintenance Costs in Mining Industry: A Case of ERG/Frontier Mine

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ABSTRACT

Mining industry is one of the most complex industrial areas where man is called to interact with different types of machinery to perform a wide range of activitie. While vehicles are key production asset, they can become sources of high maintenance costs due to operators' performance discrepancy resulting from long work leave that requires refresher training to recover driving and operation skills. With a drastic increase of vehicle-incident, this study goal was to investigate the relationship between the annual number of vehicles refresher training participants and both number of vehicles incident-based damages and related maintenace cost. The study findings reveal that there is a negative or inverse relationship between the number of refresher training participants and number of vehicles operational incident-based damages on one hand; and, a positive or directly proportional relationship between the number of vehicles driving and operational based damages and vehicles maintenance related cost on the other hand. And that, the cause-effect relationship between variables is confirmed respectively for the relationship between the number of annual vehicle driving refresher training participants & the number of vehicles operational incident-based damages; and, the relationship between the number of vehicles incident based damages and damages related maintenance cost. A particular attention should be given to regular refresher training program of vehicle operators to proactively avoid vehicle incident-based damages implying equipment maintenance cost.

KEYWORDS:

Relationship, Incidents, Damages, Maintenance, Cost, Pearson

INTRODUCTION

Mining industry is one of the most complex industrial areas where man is called to interact with different types of machinery to perform a wide range of activities. One of the machinery frequently used is the motor vehicle which is often divided into 2 categories; light vehicle and heavy vehicles. While the first is usualy used for personnel and light good transport, the second isofftenly used to ensure the transportation of raw and and finished industrial products. While vehicles are key production asset, they can become sources of high maintenance costs due to operators' performance discrepancy. The performance discrepency can be caused by the

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inactivity due to long work leaves. Lydia Kendray, the RACV Driver Training Operations Manager in (Kendray, n.d.) states that "it's normal for people to be rusty and lacking confidence on the road after long stints of lockdown" and, that "Driving is like any other skill, if you don't use it, you lose it. Habits that keep us and others safe like head checks, scanning roadside to identify potential hazards, and using indicators, can quickly go from being second nature to momentarily forgotten.

Upahita, Wong, & Lum (2018) state that: "Inactivity from on-road driving can result in deterioration of driving skills". The loss of driving skills or abilities may lead to equipment damages and injuries that will cost the organisation. That is why the refresher training should be considered to prevent to keep operators' performance so that to avoid incidents that can result in vehicles damages implying the increase of maintenance cost. (Fueltek, n.d.) states that: "Maintaining the highest health and safety standards is the goal of every business, including vehicle fleets. However, whilst all your drivers will have been required to meet those standards at one time, it can be easier than you think for those standards to slip over time.

Driver refresher training is a fantastic tool to maintain this safety level, but it also has additional benefits for your fleet's fuel efficiency and productivity." And that "All skills can become lax over time, especially if they are not performed regularly. However, even if a driver operates his vehicle daily, this refresher training is highly recommended to maintain safe driving whilst appraising their knowledge of the most up-to-date rules and regulations."It is in the context of the drastic multiplication of vehicles incidents and damages on ERG/FRONTIER site that we have decided to investigate causal relationship between the refresher training participation rate and vehicles damages/incidents and related maintenance cost..

HYPOTHESES

$H_{0:}$ There is no relationship between the number of annual vehicles refresher training participants, number of vehicles damages and related cost

Ha: There is a relationship between the number of annual vehicles refresher training participants, number of vehicles damages and related cost

RESEARCH QUESTIONS

1. What is the relationship between operators' refresher training participation rate and number of mine heavy vehicles incidents and related cost?
2. What is the strength of the statistical significance of the relationship between the number of refresher training participants and number of vehicle damages?
3. What is the root cause at the base of the continuous decrease of refresher training participants observed from 2019?

RESEARCH METHOD

The study was conducted based on historical data from training, safety and maintenance departments. The data consisted of refresher training participation rate; Number of vehicle incidents-based damages and related maintenance estimated costs were obtained through monthly reports generated from refresher training attendance list; incidents investigation reports and vehicles damages related estimated maintenance cost. The data analysis was performed using Ms-Excel that enabled us to generate the chart with trendlines relating 3 variables or metrics and chiefly refresher training participation rate; number of incidents and damages costs. We used statistical functions to test study stated hypothesis and chiefly the pearson correlation coefficient.

Given that we are dealing with linear correlation,

Hypotheses will be tested using the correlation coefficient between the dependents variables

LIMITATIONS

The present study had some challenges in collecting data relating to vehicles incidents-based damages for the period before the 2017 as there was not a systematic data tracking and recording system. The limitations were also experienced in terms in terms of literature review references.

FINDINGS

The figure 1 is the overall data visualisation of the 3 variables on the base of which this study has been conducted. Among those variables are the number of yearly participants to the vehicle driving and operation refresher training sessions, the number of vehicles incident-based damages and related maintenance costs. While the first variable is an independent variable, the 2 last variables are dependent. Meaning, when the first change, the 2 latter variables change

These data covered a period of 6 years going from 2017 to 2022.

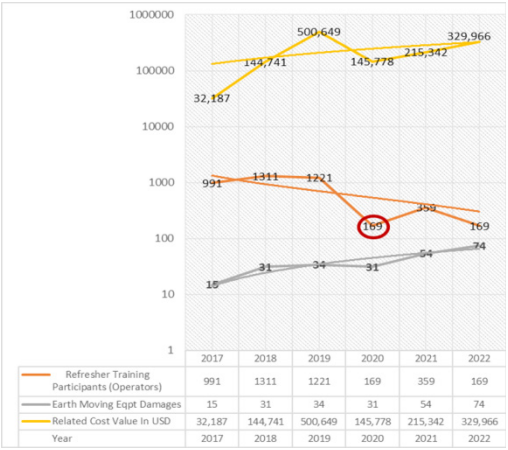

Figure 1: Refresher Training Participation,

Vehicle Damages and Damages Related Cost Trends

Thus, for 2017, 2018, 2019, 2020, 2021 and 2022 data collected respectively for the years and variables above were (991, 15, $ 32187); (1311, 31, $144741); (1221, 34, $500649), (169, 31, $145778), (359, 54, $215342) and (169, 74, $ 329966).

Given that the figure 1 reveals linear correlations between variables, the pearson correlation coefficient was used to test hypothesis (Turney, 2022). As indicated in the table 1 below, the pearson correlation coefficients were -0.61 and 0.47 respectively for the relationship between the array of vehicle driving and operation annual refresher training participants number and the array of number of vehicles incident-based damages on one hand; and the relationship between the array of number of vehicles incident-based damages and the array of vehicles damages related maintenance costs on the other hand.

Table 1: Pearson Correlation Coefficients

YEAR	Number of operators who went for light & heavy vehicles driving & operation refresher training	Vehicles damages	Vehciles Damages related Cost (USD)	Pearson correlation coefficient between number of refresher training participants and number of vehicles damages	Pearson correlation coefficient between number of vehicles damages and vehicles damages related costs
2017	991	15	$32,187	-0.61	0.47
2018	1311	31	$144,741		
2019	1221	34	$500,649		
2020	169	31	$145,778		
2021	359	54	$215,342		
2022	169	74	$329,966		

DISCUSSION

Question 1: *How is the relationship between the number of refresher training participants and number of vehicle damages?*

The results on the figure 1 above shows that trendline of number of refresher training participants is decreasive throughout the 6 years period and this inspite of positive participants variances of 320 and 190 respectively observed between 2017-2018 and 2021-2020, the trend remains negative. While the participants trend is negative, both vehicles damages and vehicles damages related maintenance costs trendlines are positive throughout the same period. In other word, the decrease of number of participants

to annual driving refresher training results in the increase of both number of vehicles incident-based damages and vehicles damages related costs. This reveals that there is negative or inverse relationship between the number of refresher training participants and number of vehicles damages on one hand; and, a positive or directly proportional relationship between the number of vehicles incident-based damages and vehicles damages related maintenance costs.

Question 2: *What is the strength of the statistical significance of the relationship between the number of refresher training participants and number of vehicle damages?*

The positive pearson correlation coefficient of -0.61 on table I reveals that there is a strong negative relationship between the number of refresher training participants and number of vehicles (Turney 2022). In other word, there is a very strong causal-effect between the 2 variables. This result in the rejection of the null hypothesis and the consideration of the asumption expressed through the alternative hypothesis (H_a) above stated (Bevans, 2022).

Question 3: *What is the root cause at the base of the continuous decrease of refresher training participants observed from 2019?*

The investigation reveals that there was a drastic change in the policies and procedure governing FRONTIER company where the management board decided to increase the duration upon which operators/drivers should go for refresher training. That duration moved from one year to 5 years.

SIGNIFICANCE OF THE STUDY

The study is highly important as it alerts the mining industry management to give a particular attention to regular vehicle driving and operation refresher training to either maintain or ensure operators' driving and operational skills. This study is of paramount importance as it provides an option on which mining industry maintenance management team can play to drastically reduce Mine vehicles incident-based damages related maintenance costs.

RECOMMENDATIONS

Employee from long leaves, should compulsory go for vehicles driving and operation refresher training to fill in vehicle operational skills and abilities gaps created in them while off from their workplace. This will preserve vehicles from incident-based damages and therefore the reduction of vehicles maintenance cost.

Any change relating to vehicles management policies should be taken in the way that will reinforce operators' skills and not the contrary.

CONCLUSION

This study aimed to investigate the relationship between vehicles operators' refresher training participation, vehicles incidents-based damages and related maintenance costs. Findings data illustration through trends clearly reveal that there is arelashionship between the number of refresher training participants, vehicles incidents-based damages and vehicles incident-based damages maintenance cost. The pearson correlation coefficients used to test set hypotheses and that sit at -0.61 and 0.47 repectively for relashionship between number refresher training participants on one hand; and, vehicles incident-based damages rmaintenance cost, reveal a strong causal-effect relationship between the 3 variables mentionned above.

The study is highly important as it alerts the mining industry management to give a particular attention to regular vehicle driving and operation refresher training to either maintain or ensure operators' driving and operational skills. This study is of paramount importance as it provides an option on which mining

industry maintenance management team can play to drastically reduce Mine vehicles incident-based damages related maintenance costs.

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Role of Employability Skill Development in Making Students Employable

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ABSTRACT

In today's highly competitive job market, it is not enough for students to possess only technical and educational skills related to their field of study. Employability skills such as communication, teamwork, problem-solving, interview skills, core-competency and leadership are increasingly important in determining an individual's employability. This paper presents a comprehensive literature review of the role of employability skill development in making students employable. The review highlights the importance of employability skills in the current job market, the types of skills that are in demand, and the various approaches used to develop these skills. It also discusses the challenges in developing employability skills and the potential solutions to overcome these challenges. The paper concludes with some recommendations for educators and policymakers to promote employability skill development and enhance students' employability.

KEYWORDS

Training and development, Placement, Industry requirement, Job market, employability

INTRODUCTION

Employability skills refer to a set of abilities, attitudes, and personal qualities that enable individuals to gain employment, maintain employment, and progress in their careers. These skills are highly valued by employers, as they are seen as essential for success in the workplace. In today's highly competitive job market, it is no longer enough to simply possess technical knowledge and expertise in a particular field. Employers now seek candidates who can demonstrate a range of transferable skills that can be applied across a variety of roles and industries. Employability is defined as the ability of an individual to gain and maintain employment in a chosen occupation or industry (McGrath,). In today's rapidly changing job market, the demand for employability skills is on the rise. Employers are looking for individuals who possess not only technical skills but also variety of employability skills that are essential for success and growth in the workplace (Sood, 2017).

Employability skills, also known as soft skills or transferable skills, are a set of personal, interpersonal, and professional skills that are essential for success in the workplace. These skills are distinct from technical or job-specific skills and are often transferable across different jobs and industries (Gowsalya, 2015).

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Key skills required for digital age

(source: author's creation)

The term "employability skills" refers to a broad range of skills, including communication, teamwork, problem-solving, time management, adaptability, leadership, and interpersonal skills. These skills are critical for success in the workplace because they enable individuals to work effectively with others, solve problems, manage their time and resources, and adapt to changing circumstances (Hillage, 1998). Employability skills are not only essential for finding and keeping a job, but they also play a critical role in career advancement and success. Employers value employees who possess strong employability skills because they are more likely to be productive, adaptable, and able to work well with others.

In addition, these skills can help individuals succeed in a variety of roles and industries throughout their career (Shukla, 2012). Developing employability skills often requires a combination of formal education, training, work experience, and personal development. Many educational institutions and employers offer programs and resources to help individuals develop these skills, including workshops, training sessions, and mentoring programs. Additionally, individuals can work to develop these skills on their own through self-directed learning, practice, and feedback.

The global job market is constantly changing and evolving, and in today's rapidly changing economy, employers are looking for candidates who possess a range of employability skills (Shukla, 2012). These skills are essential for success in the workplace, and individuals who develop and demonstrate these skills are more likely to secure employment and achieve career advancement (Saini, 2015). One of the key reasons why employability skills are so important in today's time is the rapid pace of technological change. Automation and artificial intelligence are rapidly transforming the nature of work, and many traditional jobs are being replaced by machines. As a result, employers are increasingly looking for workers who possess the skills that cannot be easily replicated by machines, such as critical thinking, problem-solving, communication, and creativity (Graham, 2017).

Another important factor driving the need for employability skills is the growing importance of teamwork and collaboration in the modern workplace. As companies become more global and diverse, the ability to work effectively with others from different backgrounds and cultures has become essential (Kapooria, 2015). Employability skills such as communication, cultural competence, and leadership are critical for building strong teams and achieving business success. Finally, employability skills are important because they are transferable across different industries and roles. In today's economy, many workers will have multiple careers over the course of their working lives, and employability skills are essential for adapting to new roles and industries (Okada, 2012).

REVIEW OF LITERATURE

Definitions of employability skills

Definitions	Author/s
"Employability is about being capable of getting and keeping fulfilling work, more comprehensively employability is the capability to move self-sufficiently within the labor market to realize potential through sustainable training, development & employment"	*Hillage & Pollard (1998)*
"The core capability to move into and within labor markets and to realize potential through sustainable and accessible employment"	*The Department for Employment & Learning of Northern Ireland (2004)*
"Non-technical skills and competencies which play a significant role in contributing to an individual's effective and successful participation in the workplace"	*Department of Education, Sciences and Training of Australia (2002)*
"Graduates identifying employability skills as higher order thinking skills in coordination with affective skills and traits required to obtain a job"	*Wickramasinghe & Perera (2010)*

Role of employability skills in making a student employable

Employability skills play a crucial role in making a student employable. Employability skills refer to a set of skills, knowledge, and attitudes that enable individuals to gain and maintain employment, as well as to progress within their careers (Bennett, 2006). Employability skills are highly valued by employers because they demonstrate an individual's ability to work effectively with others, solve problems, and adapt to changing circumstances. Employers seek candidates who possess a combination of technical and soft skills, as well as a willingness to learn and grow (Kenayathulla, 2019).The role of employability skills in making a student employable can be summarized as follows:

- **Demonstrating competence**: Employability skills demonstrate to employers that the student has the necessary knowledge, skills, and attitudes to perform effectively in the workplace. Employers look for candidates who possess a combination of technical and soft skills, as well as the ability to apply these skills in real-world situations (Brewer, 2013). One of the key roles of employability skills in making a student employable is demonstrating competence. Employability skills are a combination of technical skills, soft skills, and personal qualities that enable individuals to perform effectively in the workplace. Employers seek candidates who possess the necessary skills and knowledge to perform their roles effectively. Possessing employability skills such as critical thinking, problem-solving, communication, teamwork, time management, and adaptability demonstrates to employers that the student has the competence to succeed in their roles. By demonstrating competence in employability skills, students can increase their chances of being hired and performing effectively in their roles. Moreover, possessing these skills can contribute to their professional development and help them to advance in their careers (Pengnate, 2018).
- **Enhancing competitiveness:** Employability skills can give students a competitive edge in the job market. In a highly competitive job market, candidates who possess strong employability skills are often more attractive to employers than those who do not. Another important role of employability skills in making a student employable is enhancing competitiveness (Engmann, 2014). In today's job market, employers seek candidates who possess a range of technical and soft skills that

enable them to perform effectively in their roles and contribute to the success of the organization. Possessing strong employability skills such as communication, teamwork, problem-solving, adaptability, and time management can make a student more competitive in the job market.

Employers look for candidates who can demonstrate their ability to work effectively with others, adapt to changing circumstances, and find innovative solutions to problems. For example, a student who possesses strong teamwork skills can collaborate effectively with colleagues, which is highly valued in many industries (Sermsuk, 2014). Similarly, a student who possesses strong problem-solving skills can find innovative solutions to complex problems, which is an essential skill in many industries. By possessing strong employability skills, students can differentiate themselves from other candidates in the job market and increase their chances of being hired (Pool, 2007). Additionally, possessing these skills can contribute to their professional development and help them to advance in their careers.

- **Contributing to job performance:** Employability skills can contribute to a student's job performance, as they are better equipped to handle the challenges of their roles and have the ability to contribute meaningfully to the success of the organization (Abdullah, 2019). Another key role of employability skills in making a student employable is contributing to job performance. Employability skills such as communication, teamwork, problem-solving, adaptability, and time management can help students perform effectively in their roles and contribute to the success of the organization (Singh, 2014).

  For example, a student who possesses strong communication skills can effectively convey their ideas and collaborate with colleagues, which can lead to improved productivity and better outcomes. Similarly, a student who possesses strong problem-solving skills can quickly identify and address issues that arise in the workplace, which can help to prevent further problems and improve overall performance. By possessing strong employability skills, students can contribute meaningfully to their roles and help to drive the success of the organization (Khurana, 2017). Employers value candidates who can contribute to their organization's success, and possessing strong employability skills can help students to stand out in the job market and advance in their careers.

- **Enabling career advancement:** Employability skills can enable students to advance in their careers by demonstrating their ability to lead, collaborate, problem-solve, and adapt to changing circumstances. Another important role of employability skills in making a student employable is enabling career advancement (Mason, 2009). Employability skills such as communication, teamwork, problem-solving, adaptability, and time management can help students to advance in their careers by enabling them to take on new responsibilities and perform effectively in more senior roles. For example, a student who possesses strong leadership skills and the ability to work well with others can be promoted to a management position, where they can lead and motivate a team (Robles, 2012). Similarly, a student who possesses strong problem-solving skills and the ability to work independently can be given more complex projects and responsibilities.

- **Increasing job satisfaction:** Employability skills can contribute to job satisfaction by enabling students to find roles that align with their skills and interests, and by providing them with a sense of fulfilment and accomplishment (Ito,

2015). Job satisfaction refers to an individual's level of contentment with their job and the work environment. It is a subjective feeling that can be influenced by a range of factors such as job security, compensation, work-life balance, relationships with colleagues, opportunities for growth and development, and the degree of autonomy and control they have over their work (Rothwell & Arnold, 2007). Job satisfaction is important because it can have a significant impact on an individual's overall well-being and mental health. Employees who are satisfied with their jobs tend to be more engaged, motivated, and committed to their work, which can lead to better performance, productivity, and job retention (Selvadurai, 2012).

On the other hand, employees who are dissatisfied with their jobs may experience stress, burnout, and reduced motivation, which can negatively impact their health and well-being (Ajwad, 2014). Moreover, possessing strong employability skills can enable students to take on new challenges and responsibilities, which can lead to further job satisfaction and career growth. Employers value candidates who are motivated and committed to their roles, and possessing strong employability skills can help students to achieve their career goals and increase their job satisfaction over time. Employability skills can play a key role in increasing job satisfaction by enabling employees to perform effectively in their roles and achieve a sense of accomplishment and fulfilment (Andrews, 2008). By possessing strong employability skills such as communication, teamwork, problem-solving, adaptability, and time management, employees can contribute to a positive work environment and build strong relationships with colleagues. This can increase job satisfaction by fostering a sense of community and belonging.

How employability skills can make a student employable

Employability skills are those skills that are necessary for a student to be able to find and keep a job. These skills include both technical skills, which are specific to a particular job or industry, and soft skills, which are more general skills that are applicable in any job or industry. Employability skills can make a student more employable because they demonstrate to potential employers that the student possesses valuable attributes that can help them succeed in the workplace. Employability skills can make a student employable in a number of ways:

1. **Competitive Advantage**: Employability skills can give students a competitive advantage over other job candidates. Employers are often looking for candidates who possess more than just technical or academic qualifications, and students who can demonstrate strong employability skills may have an edge in the job market. Competitive advantage refers to the edge that an individual or a company has over others in a particular market or industry (Blom, 2011). In the context of employability skills, possessing strong employability skills can give a student a competitive advantage over other job applicants. Employers are often looking for candidates who possess a combination of technical skills, academic qualifications, and employability skills. Strong employability skills, such as communication, teamwork, problem-solving, and adaptability, can help students stand out from other candidates who may only possess technical or academic qualifications (Brutus, 2010).

   For example, in a job interview, a student who can demonstrate strong communication and teamwork skills may impress the interviewer and be more likely to be hired than a candidate who only possesses technical qualifications. In a competitive job market, possessing strong

employability skills can make a significant difference in a student's ability to secure a job. It can also increase their chances of being promoted or advancing in their careers (Caligiuri, 2012). By developing and demonstrating strong employability skills, students can position themselves for success in the job market and gain a competitive advantage over other candidates.

2. **Adaptability**: Employability skills, such as adaptability and flexibility, can help students to succeed in a rapidly changing job market. These skills enable students to adjust to new situations and learn new skills quickly, making them more versatile and valuable employees. Adaptability refers to an individual's ability to adjust to new situations, environments, and changes in the workplace. Adaptability is a highly valued employability skill because it enables individuals to be flexible and responsive to changing circumstances, which is essential in today's fast-paced and ever-changing job market (Zorzie, 2012).

   Students who possess strong adaptability skills can quickly learn new skills and technologies, and can adjust to new work environments and cultures. This can make them more valuable employees, as they are better able to adapt to new roles and responsibilities. In addition, adaptability can help students to overcome challenges and obstacles in the workplace. Students who can approach challenges in a creative and systematic way are often able to find solutions to problems more efficiently, which can increase their productivity and contribute to the success of the organization (Griffin, 2013). Furthermore, in industries that are undergoing significant changes, such as the technology industry, adaptability is especially important. Students who can adapt to new technologies and changes in the industry are more likely to succeed in their careers.

3. **Career Advancement**: Employability skills can also help students to advance in their careers. By demonstrating leadership, teamwork, and communication skills, students can position themselves for promotions and other career opportunities. Employability skills can also contribute to career advancement for students. Career advancement refers to the process of moving up the career ladder or progressing to higher-level positions within an organization. Students who possess strong employability skills, such as leadership, teamwork, communication, and problem-solving, are often more likely to be considered for promotions and other career opportunities (WEF, 2010; Husain, 2010).

   These skills demonstrate to employers that the student has the ability to work effectively with others, lead teams, and solve complex problems, which are all important qualities for higher-level positions. For example, a student who demonstrates strong leadership and communication skills may be considered for a management position, or a student who excels in problem-solving may be considered for a role in research and development (Cox, 2016). In addition, possessing strong employability skills can increase a student's visibility within the organization and make them more likely to be recognized for their contributions. This can lead to opportunities for advancement and career growth.

4. **Job Performance**: Employability skills can also contribute to job performance. Students who possess strong employability skills, such as time management and problem-solving, are often more productive and successful in their roles. Employability skills can also contribute to job performance for students. Job performance refers to an individual's ability to meet the requirements of their role and achieve their goals within the organization (Jackson, 2013). Students who

possess strong employability skills, such as time management, problem-solving, communication, and teamwork, are often more productive and successful in their roles. These skills enable them to prioritize tasks, work efficiently, and collaborate effectively with others.

For example, a student who possesses strong time management skills is able to prioritize tasks and meet deadlines, which can lead to increased productivity and better performance. Similarly, a student who possesses strong problem-solving skills can quickly identify and resolve issues, which can contribute to the success of the organization (Lauder, 2013). Moreover, students who possess strong communication and teamwork skills are often better able to work with colleagues, customers, and stakeholders, which can enhance their performance and contribute to the success of the organization. However, possessing strong employability skills can contribute to job performance for students. By continuously developing and utilizing their skills, students can excel in their roles and achieve their professional goals.

5. **Career Satisfaction:** Finally, employability skills can contribute to career satisfaction. By developing and using their employability skills, students can feel more confident and capable in their roles, leading to greater job satisfaction and fulfilment. Employability skills can also contribute to career satisfaction for students (Lim, 2016). Career satisfaction refers to an individual's level of happiness and fulfilment in their job or career. Students who possess strong employability skills are often more satisfied in their careers because they are better equipped to handle the challenges of their roles and have the ability to contribute meaningfully to the success of the organization.

   For example, a student who possesses strong leadership and communication skills may enjoy the challenge of managing a team and contributing to the growth of the organization. Similarly, a student who possesses strong problem-solving and adaptability skills may enjoy the challenge of finding innovative solutions to complex issues (Vashisht, 2016). Moreover, students who possess strong employability skills are often more confident in their abilities, which can contribute to their overall career satisfaction. By continuously developing and utilizing their skills, students can feel a sense of accomplishment and fulfilment in their roles. However, possessing strong employability skills can contribute to career satisfaction for students. By finding roles that align with their skills and interests, students can create a fulfilling and rewarding career that brings them satisfaction and happiness.

Employability skills are the set of skills, knowledge, and personal attributes that enable an individual to perform effectively in a job. These skills are highly valued by employers, and possessing them can greatly increase a student's chances of finding employment (Singh, 2017).

By developing these employability skills, students can enhance their chances of being hired by potential employers. Additionally, having these skills will help students to be successful in their careers and advance in their chosen fields. Employers value

employees who can communicate effectively, work well in a team, solve problems creatively, adapt to changing situations, manage their time effectively, and demonstrate leadership potential (Davies, 2011). By developing and demonstrating these skills, students can show potential employers that they have the ability to be productive, successful, and valuable members of the workforce. Furthermore, employability skills are transferable across different jobs and industries, which means that students who possess these skills can be adaptable and successful in a variety of roles (Srivastava, 2012). In summary, employability skills can definitely make a student more employable and enhance their career prospects.

Here are some of the ways in which employability skills can make a student employable:

Adaptability	Employers look for candidates who are adaptable and can quickly adjust to new situations. A student who has demonstrated adaptability in their academic career is more likely to be seen as employable. In today's fast-paced and ever-changing work environment, adaptability is crucial. A student who can adapt to new situations and technologies will be more attractive to employers. The ability to adapt to changing situations and learn new skills quickly is highly valued in the workforce. Students who are adaptable and open to change will be more attractive to employers.
Communication skills	Effective communication skills are highly valued by employers. A student who can communicate effectively both orally and in writing is more likely to be seen as employable (Bharathi, 2016). Good communication skills are essential for any job. A student who can communicate clearly and effectively can work well in teams, handle customer complaints, and negotiate with suppliers (Seth, 2013). Effective communication is essential in almost all types of jobs. Students who can communicate clearly, both verbally and in writing, are more likely to be hired.
Teamwork	Most jobs require individuals to work collaboratively with others. A student who has experience working in a team and has demonstrated good teamwork skills is more likely to be seen as employable. Most jobs require working with others, so students who can collaborate effectively and contribute to team goals are more attractive to employers. Teamwork skills refer to the ability to work effectively and collaboratively with others towards a common goal (Saunders V. a., 2010). These skills are highly valued in the workplace because they enable individuals to contribute to the success of the team and the organization as a whole. Teamwork often involves individuals from diverse backgrounds and perspectives. Individuals with strong teamwork skills are able to work effectively with others from different backgrounds and cultures, and appreciate the value of diversity.
Time management	The ability to manage time effectively is highly valued by employers. A student who has demonstrated good time management skills is more likely to be seen as employable. Being able to manage time effectively and prioritize tasks is important in most jobs. Students who can demonstrate good time management skills are more likely to be successful in their careers. Time management skills refer to the ability to manage and prioritize tasks effectively to make the most of one's time. These skills are highly valued in the workplace because they enable individuals to meet deadlines, complete tasks efficiently, and be productive.
Critical Thinking	Employers want employees who can analyse complex problems and make informed decisions. A student who can demonstrate critical thinking skills will be a valuable addition to any team. Critical thinking is the ability to analyse information objectively and make informed decisions based on evidence and logical reasoning (Pool, 2012).

Employer Perception on Employability Skill

Employers place a high value on employability skills, often considering them just as important as technical or job-specific skills. In fact, many employers believe that employability skills are essential for success in the workplace, regardless of the industry or job function. Employability skills demonstrate an individual's ability to work effectively with others,

think critically, communicate clearly, and adapt to changing situations. Employers value these skills because they enable individuals to be productive and successful in their roles, and to contribute to the success of the organization as a whole (Chavan, 2014). Employers often use employability skills as a way to differentiate between candidates when making hiring decisions. In addition to technical skills and academic qualifications, employers look for candidates who possess strong employability skills, as these skills are transferable across different jobs and industries.

Furthermore, employers may invest in training and development programs to help their employees develop and enhance their employability skills. This investment can result in a more productive and successful workforce, and can help employees to advance in their careers (Mansour, 2016). Employers generally place a high value on employability skills, also known as soft skills, when considering potential employees. These skills include communication, problem-solving, teamwork, adaptability, leadership, time management, and other traits that go beyond technical expertise and academic qualifications. Employers understand that these skills are critical for success in the workplace, as they contribute to productivity, collaboration, and overall job performance (Pieters, 2013).

In fact, some studies have suggested that soft skills are just as important as technical skills, if not more so, in determining an employee's success in a job (Mitchell, 2010). Moreover, employers often view employability skills as transferrable skills that can be utilized in different roles and industries. As a result, possessing these skills can enhance an individual's career prospects and make them more attractive to employers. However, employers place a significant emphasis on employability skills when evaluating potential employees, recognizing the value of these skills in contributing to job performance and career success. Employers generally view employability skills as critical for success in the workplace. In a survey conducted with recruiters from several industries to know how much importance does employability skills have especially in case of a new joiner (Selvasundaram., 2016).

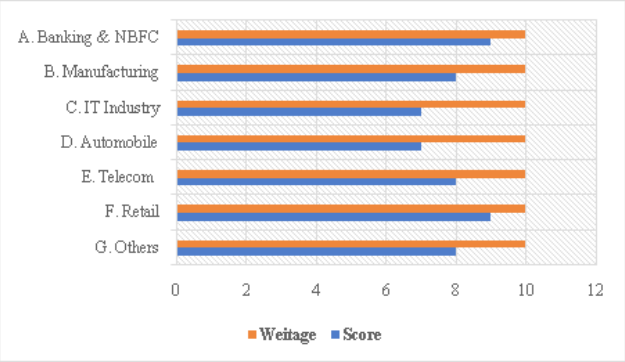
The outcomes clearly define that employability skill has a great impact in one's profile and overall functioning. Employers ranked "soft skills" such as communication, teamwork, time management, leadership qualities, core-competency development and problem-solving as some of the most important factors in hiring decisions (Archer, 2008). Employers also recognize the importance of adaptability and a willingness to learn in today's rapidly changing job market. Following are the outcome of the survey describing the significance of employability skills (Asirvatham, 2017).

The first question reveals the involvement of recruiters from major industries including banking & NBFC, manufacturing, IT industry, automobile, telecom, retail and others specifying not in the above list. Almost equal the numbers were chosen to balance the study and get the maximum exposure about their preferences and importance to employability skills in their hiring process.

Banking & NBFC	Manu-facturing	IT Industry	Auto-mo-bile	Tele-com	Re-tail	Others
14%	12%	9%	11%	16%	15%	23%

The second aspect was taken in the study is to evaluate the weightage and importance they give to employability skills development especially in case of a new joiner. They participants were asked to rate the employability skill on a scale to 1 to 10, in which 1 is lowest rank and 10 is the highest rank. Banking and NBFC and retail industry recorded about 9 on 10, manufacturing noted 8 on 10, IT industry and automobile mentioned 7 on 10, whereas other

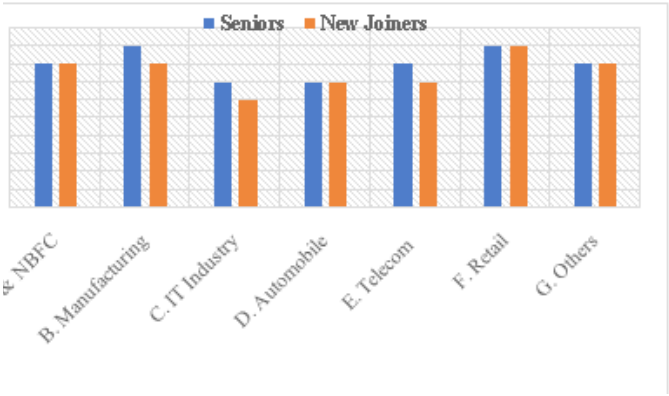
category shared 8 on 10. Which itself gives a clear idea that employability skills are the utmost thing in any industry and thus, a student need to focus on these while upgrading their knowledge and education altogether.



Next, the participants were asked to rate which employability skills is more significant to them being involved in hiring process, by rating each aspect on a scale 1 to 10, in which 1 is lowest and 10 is the highest mark. The outcome of the study shows that recruiter gives much attention on communication skills, team work, core competency development, problem solving, time management, leadership qualities and others including adaptability and willingness as follows:

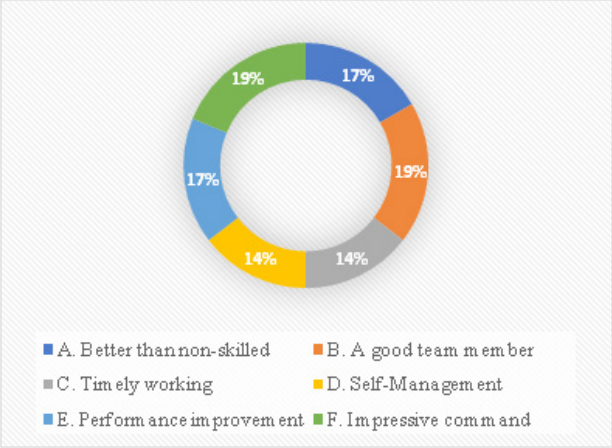
Communication	Teamwork	Core Competency Development	Problem Solving	Time Management	Leadership Qualities	Others (Adaptability & Willingness)
8%	9%	7%	7%	8%	9%	8%
(On a scale to 1 to 10) 10 is highest, 1 is lowest						

Next, we asked them to give remark on who needs employability skill development more, a senior employee or a new joiner.



The outcome of the study clearly defines that almost the same weightage and score given to the both categories in few less or more numbers. That means, employability skills development is needed at any phase of one's career, whether he is a senior most employee or a fresh joiner in an organization.

And lastly, we asked participants to present the final statement by measuring that what sort of impact they noticed in a new hired employee, who has trained well in the area of employability skills. The outcome shows that the one who has gained employability skills development training is better than the one who has not (8 on 10), further they observed that he is a good team member, he is completing his task within time, he has a good self-management approach, his performance is observed growing and improving, he is very impressive at workplace as well.



This data is enough to highlight the significance of

employability skills amongst employees especially in students or new joiner, who are about to start their professional career in today's fast changing world.

CONCLUSION

In summary, employability skills play a critical role in preparing students for the job market and making them employable. Employability skills refer to a set of attributes, abilities, and knowledge that enable individuals to obtain and retain employment, and perform effectively in their roles. These skills include communication, problem-solving, teamwork, time management, adaptability, willingness, competency and leadership, among others. By developing employability skills, students and employees can enhance their chances of securing a job, progress in their careers, and succeed in a competitive job market.

In today's rapidly evolving workplace, employers increasingly value individuals with a combination of technical knowledge and soft skills, which can lead to higher job satisfaction, productivity, and profitability. Moreover, employability skill development is not limited to formal education or training programs; it can also be fostered through experiential learning, internships, and volunteer work. Therefore, it is crucial for students to actively seek opportunities to develop and demonstrate their employability skills throughout their academic and professional journeyby recognizing the importance of employability skills and investing in their development, students can enhance their employability, build successful careers, and contribute to the growth of the economy.

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Role of Knowledge Management in Transportation: A Comprehensive Review

Shivangi Singh*
Santosh Rangnekar**

ABSTRACT

Purpose: - The study aims to evaluate KM models that represent a wide spectrum of views within the field. And to suggest an appropriate framework for carrying out a further in-depth critique of the field of KM, also leading to improved theory and practice within the field.

Design/methodology/approach: - The study adopts the bibliometric analysis to carry out a literature review of the existing past studies to examine the role of knowledge management in transportation. It includes the time span of the last 37 years. The study uses scientific mapping as well as critical reviews of the research done on the research theme.

Findings: - This study also demonstrates that the concept of knowledge management is not only restricted to the fundamental Knowledge base, Inference engine, and user interface but also, due to advancements in Artificial intelligence, the addition of probability-based, machine learning, rule based, knowledge based expert system, online data acquisition & processing modules over the period of 1985–2022.

Originality: - This study unfolds the role of knowledge management involvement in transportation and its positive impact in this field. This study discusses the relationship between knowledge management and knowledge-based systems in different applications of knowledge management. The keyword co-citation network shows how the knowledge management domain formation has evolved over the course of time. It also discusses the evolution of the components of the knowledge management framework due to the inclusion of artificial intelligence.

KEYWORDS

Knowledge Management, Knowledge-based systems, Transportation, Artifical Intelligence

INTRODUCTION

According to the knowledge-based perspective, the applications and combinations of tangible resources determine the services they provide, which in turn depend on the firm's know-how (i.e., knowledge). The culture and identity of the organisation, daily routines, policies, procedures, systems, documents, as well as

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individual employees, all carry this knowledge and are embedded in them (Alavi et al. 2001)however, there has been a growing interest in treating knowledge as a significant organizational resource. Consistent with the interest in organizational knowledge and knowledge management (KM. This information is ingrained and transmitted through a variety of entities, including personnel routines, organisational culture and identity, policies, systems, and publications. Past studies have explained the term knowledge management in several classifications. Most of the studies have described Knowledge management as a process used to increase efficiency, effectiveness, and creativity inside an organisation, which entails the creation, sharing, use, and management of knowledge and information.

As, the core fundamental of the Knowledge management process constitutes the Knowledge identification, capture, storage, retrieval, and dissemination of information across an organisation to assist in decision-making, promote the growth of the industry as well as enhance the knowledge inside the organisation. Also, knowledge management promotes innovation as by sharing knowledge across the departments, and organisations it leads to the generation of innovative ideas. It also assists in collaboration and communication across different departments, which leads to greater productivity, efficiency, and creativity. Also, when information is centralised and accessible, it reduces the duplication effort or wasting time in searching the information that exists.

The straightforward model of knowledge management defines it as the conversion of tacit knowledge into explicit knowledge as proposed by authors Nonaka et al. (1995). Nonaka has explained the spiral process of knowledge management that consists of four process Socialization, Externalization, Combination, and Internalization. In which each process plays a significant role in knowledge sharing. Socialization process involves sharing of tacit knowledge through experience, imitation, and observation. In the transportation industry, this can be achieved through training programs, mentoring, and other forms of knowledge sharing that encourage collaboration and dialogue between different stakeholders.

The externalization process involves the conversion of tacit knowledge into explicit knowledge which can be done through expert surveys, user-based surveys and represented through diagrams and other forms of communication. It states that making implicit knowledge explicit and then its dissemination with the help of information technology which he termed is socialization. This socialization of knowledge or knowledge transfer plays a vital role in the management of many operations successfully. In the transportation industry, this can be achieved through the development of data-driven systems and technologies that capture and analyse transportation data to generate insights and knowledge.

Combination is the process combines the explicit knowledge from different sources to form a new knowledge base which creates a coherent system. It can be achieved through integration of explicit knowledge through various techniques such as categorization, analysis, and synthesis. In the transportation industry, this can be achieved through the use of integrated transportation systems that combine different modes of transportation and leverage data analytics to optimize routing and improve efficiency.

The fourth and final step in Nonaka's internalization process is internalization, which involves the embedding of explicit knowledge into organizational practices and culture. In the transportation industry, this can be achieved through the adoption of sustainable transportation practices and policies

that prioritize efficiency, safety, and environmental sustainability.

Nonaka's SECI (Socialisation, Externalization, Combination, and Internalization) model asserts that knowledge is created through a spiral process that requires constant transition between these four types of knowledge conversion. Organisations can generate new information, innovate, and maintain competitiveness in their specific marketplaces through this process.

While this model was originally developed in the context of knowledge management in business organizations, it can be applied to many different domains, including traffic management, Bus transit management system, Incident management, Congestion management and so on.

The later section of the paper discusses the in-detail knowledge management and knowledge management process shows the cyclic evolution of the knowledge across different components in transportation sector. Also, study examines the how important it is to reuse and evaluate the knowledge created and implemented for transport sector.

REVIEW OF LITERATURE

Definition of Knowledge Management

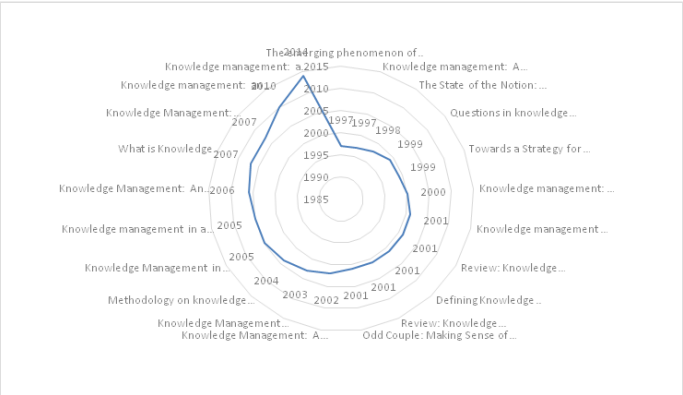

Figure 1: The evolution of Knowledge Management

The figure 1 shows the evolution of knowledge management definition. In study conducted by the authors Broadbent (1997) defines Knowledge management as the type of expertise-centred management that extracts tacit knowledge and makes it usable for certain goals to enhance organisational performance. On contrary authors Quintas *et al.* (1997) states that managers have to experience hurdles when using knowledge management as a source of competitive advantage. In study conducted by author Ruggles (1998) defines knowledge management as a strategy for enhancing or creating value by more actively utilising the expertise, experience, and judgement found both inside and, frequently, outside of an organisation. Author Uit Beijerse (2000) has highlighted the role of knowledge workers in its study and defines knowledge management as by encouraging and assisting knowledge workers in interpreting data and information, knowledge management helps organisations achieve their goals.

However, shortcomings in implementing knowledge management has been highlighted by study done by Blumentritt & Johnston (1999), where they stated the challenges of Knowledge management. They focussed on the optimising of information -knowledge balance which gives a competitive advantage. Also, specifically addressing the knowledge-information connections and mechanisms for improving the processes of transition from information to knowledge, and from knowledge to information.

Knowledge management (KM) is assist organisations in locating, selecting, organising, disseminating, and transferring crucial information and skills required for tasks including problem solving, active learning, strategic planning, and decision making. Also, it states the numerous criteria for measuring the effectiveness of how successful the knowledge management in organisations is (Gupta *et al.*, 2000)

(Satyadas *et al.*, 2001) Knowledge management is a discipline that offers a method, an approach, and

technologies to exchange and use knowledge and expertise that will improve our level of understanding, help us solve issues, and help us make decisions more successfully. A also drawn the road map of knowledge management for addressing key views of codification, various knowledge contexts and cognitive elements.

(Alavi et al. 2001) however, there has been a growing interest in treating knowledge as a significant organizational resource. Consistent with the interest in organizational knowledge and knowledge management (KM Knowledge management in organisation is knowledge transfer between individuals, groups occur among and across various entities and these entities could be individual, tacit knowledge sources and groups.

According to Alvesson & Kärreman, 2001, Knowledge management can be thought of as a catch-all phrase encompassing a diverse range of academic perspectives. These include organisational learning and information systems, as well as managerial strategy and creativity.

Dalkir (2006), defines knowledge management as a planned and organised strategy for developing and disseminating an organization's knowledge base is known as knowledge management (KM). It is a very interdisciplinary field that includes both intellectual property and information technology.

The study conducted by authors Kumar & Thondikulam (2005) has highlighted the development of a knowledge representation process, the knowledge procurement process, and the knowledge organisation that facilitates the development of an enterprise knowledge base.

Due to the diverse characteristics of knowledge and Knowledge management, it has different definitions and classification. Also, it has given rise to various kinds of systems which can be easily used by the organisations for creating innovation and has a competitive advantage among its competitors. This study shows the one such application of knowledge management and knowledge creation, storage, and transfer in Transportation.

Transportation and Knowledge Management

The knowledge-based system is a system which is purely based on the fundamental aspect of converting human expertise or years of knowledge into a set of rules or rules heuristics that can be used to solve an ill-structured, unbalanced complex problem. The knowledge-based models are the subset of the umbrella term knowledge management. As, the documentation of knowledge management in transportation industry marks its presence from the early 1980's. This is the basic representation of the Knowledge-based system (KBS) presented by (Wood, 1985). Woods discussed the application of KBS for Transit Bus Maintenance.

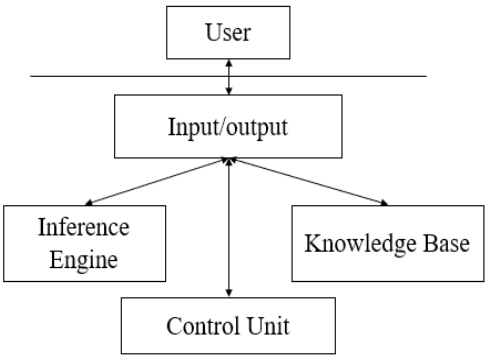

Figure 2: Basic architecture of the KBS (Wood, 1985)

Here, the basic structure of the KBS model consists of an inference engine, a knowledge base and control Unit.In the field of transportation systems, knowledge representation and knowledge discovery always playa vital role.The author of (Yeh *et al.*, 1986) has demonstrated the possible uses of KB Expert systems (KBEs) in engineering and transportation planning. Since the transportation industry is complicated and incorporates human behaviour, social and political

factors, and scenarios with several objectives for making decisions, they have demonstrated that KBEs systems can solve explicit algorithms. In his study, Ritchie (1987) have illustrated the use of expert systems in pavement management, demonstrating the necessity for computerised pavement management systems capable of resolving a number of decision-making issues related to pavement rehabilitation and strongly recommending pavement appropriateness approaches. Another study conducted by the authors Ritchie in 1990 shows the conceptual framework of Knowledge based decision support system architecture for traffic management especially for the non-recurrent congestion scenarios to assist traffic personnel for decision making process.Their study showed the use of heuristics algorithm for detection of congestion and coordination among different components of the KB decision support module. Apart from the conceptual decision support architecture framework study also highlights the use of knowledge engineering languages that would be helpful in extracting the data from the Inference engine as well as the importance of the software environment.

Taylor (1990) has given formative steps for route selection through knowledge-based systems to provide route guidance information among the selected group of travellers. The study highlighted the procs and cons of applying fifth generation languages for solving the route guidance problem as well as provides the most suitable advice to its users instead of best one depending upon the user's level of satisfaction. The have simply added the explanation facilities and knowledge acquisition tools in user interface component of KBS module to link with problem data and decision between the users.

Linkenheld *et al.* (1992) traffic signals need to respond to the changes in roadway and traffic demand. The phasing and timing of traffic signals requires the use of heuristic rules of thumb to determine what phases are needed and how the green time should be assigned to them. Because of the need for judgmental knowledge in solving this problem, this study has used knowledge-based expert-system technology to develop a system for the phasing and signal timing (PHAST) in the study has developed a knowledge based expert system for phasing and signalling time of the traffic signals at intersections. The study highlighted the shortcoming in the previous knowledge based expert system and focussed on the importance of knowledge acquisition process which was almost neglected in earlier KBS systems. They showed the importance of the heuristics (rules) made from the expert's knowledge to understand the interaction of the traffic flow and increasing traffic demand to tune the traffic signals phase and time accordingly.

Logi & Ritchie (2001) described a real-time knowledge-based system (KBS) that assists Traffic Operation Centre staff in choosing integrated traffic control strategies following the appearance of irregular congestion on motorway and arterial networks. The study proposed TCM (Traffic Control Monitor), stands out for its capacity to work with the operator, handle various input data sources and inferred knowledge, and provide an explanation of its thought process. To give a precise evaluation of traffic conditions, a data fusion technique for the analysis of congestion its representation and interpretation of multiple forms of data, with varying degrees of dependability and uncertainty has been used. This approach has provided a decision support for to traffic operation centre.

Logi & Ritchie (2002) an innovative multi-agent architecture for the provision of real-time decision support to Traffic Operations Center personnel for coordinated, inter-jurisdictional traffic congestion management on freeway and surface street (arterial has proposed a system named CARTESIUS, multi

agent architecture for real time decision support system for providing assistance to traffic control operators for taking real time decision in traffic congestion management for freeways and arterial roads. The basic function of CARTESIUS was to report the incident occurrence on freeways and arterial road networks to the operators and assist them in taking the decision as a response to the events/incident occurrence.

A few research questions that can be addressed from the above literature review are: -

- What are the key components of knowledge management in Transportation which were common in all applications of Transportation?
- How can the involvement of Knowledge management practices can be visualised in transportation?
- How has the knowledge management framework evolved over the years in Transportation?
- How the experts/ decision support systems of creates the knowledge-based models of Transportation?
- What are the current trends in the integration of artificial intelligence and deep learning models to the existing models of transportation?

Hence, the following objectives have been established to fulfil the study purpose are: -

- To evaluate KM models that represent a wide spectrum of views within the field.
- To suggest an appropriate framework for carrying out a further in-depth critique of the field of KM, also leading to improved theory and practise within the field.

RESEARCH DESIGN

This study employs the bibliometric analysis over the existing literature to investigate the role of Knowledge Management in Transportation which includes the Knowledge Creation, Knowledge Sharing, Knowledge Transfer, knowledge-based systems, and knowledge driven systems in transportation. A bibliometric analysis reveals the study areas that provide the most findings in a certain field (Bamel *et al.*, 2020). Bibliometric analysis can be done in both ways either by simple science mapping analysis and performance analysis (Farooq, 2022). The bibliometric analysis is the quantitative technique to evaluates the output and influence of specific research, detect research hubs, maps the development of scientific disciplines, and pinpoint significant publications. It can also be used to assess the calibre of research output, over time span knowledge base generation. The quantity of publications, the number of citations received, the h-index, the impact factor, and journal rankings are examples of common bibliometric metrics. With the use of different software programmes and databases, such as Web of Science and Scopus, bibliometric analysis can be carried out. Some literature has adopted only science mapping of the research theme, and some has done performance analysis. This study has adopted science mapping and performance analysis of the research topic and then uses TCCM framework for critically analysing the studies. The following figure 3 shows the research design of the study.

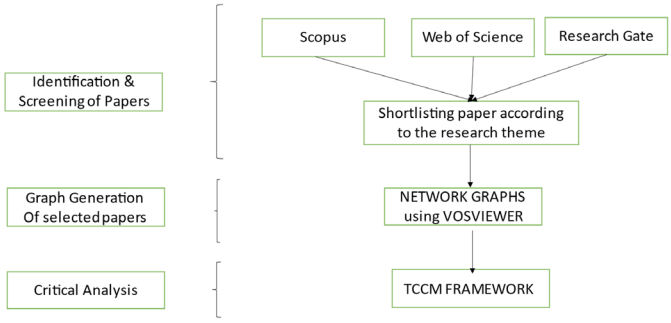

Figure 3: Shows the Research Design

ANALYSIS

Descriptive Analysis

Keyword co-occurrences analysis can be used to track research themes and developing fields because keywords give crucial information into the article's content. Keyword occurrence analysis of shortlisted papers shows the knowledge base evolution of knowledge management over the period. This is the Network generated from the shortlisted journal papers related to knowledge management in Transportation. It shows the clusters of the keywords with an occurrence rate of more than 60%. This network has been generated from the VOS viewer.

To identify the study objectives, central issues, and method/technology employed in a certain field, keywords are frequently utilised as tools (Huang et al., 2020). This study implies co-occurrence networks to find and examine the distribution of terms in knowledge management studies. As a result, a network map representing a keyword co-occurrence network illustrates the relationship between these keywords (Huang et al., 2020). These network layouts are generated through a clustering algorithm depending on the strength of the association link between the keywords.

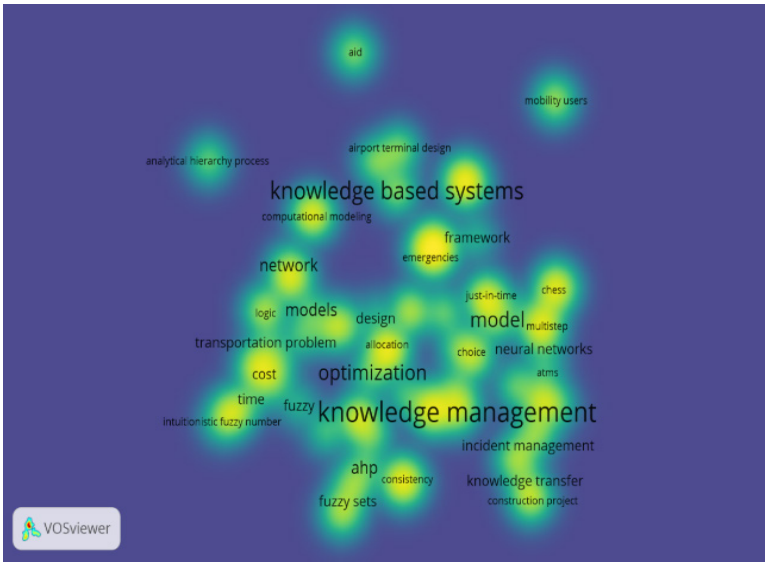

Figure 4: Keyword co-occurrence network of the research theme

Figure 4 shows the clusters formed containing co-occurrence keywords where around 21 clusters are formed. The knowledge base formed by the keywords are Knowledge management, Knowledge-based systems, optimization, transportation problems, Fuzzy sets, Knowledge transfer, Analytical hierarchical process, neural networks Rule based, decision support systems, Knowledge base. These keywords are represented by the nodes and the size of the nodes depends upon the frequency of the occurrence of keywords.

Analysis based on TCCM Framework

This study uses TCCM (Theory, Context, Characteristics and Methods) framework given by authors Rosado-Serrano *et al.* (2017). This framework is also used by other studies to do literature review in different domains are listed by Singh & Dhir, 2019 and Paul & Rosado-Serrano (2019). This study does bibliometric analysis with help of software Vos viewer and conducted the critical analysis of the shortlisted paper through TCCM framework. Table no 1 shows the detail studies knowledge-based system studies done in transportation.

Table 1: Studies identified on TCCM framework for KBS in Transportation

Authors	Theories	Context	Characteristics	Methodology
(Teh *et al.*, 2005)	Road development material selection system	Pavement design (Malaysia)	Road designers able to choose right type of material in priority for selection of pavement material.	Two stage questionnaires have been used to extract knowledge from experts Based on experts' knowledge RC-MSS system has been made to assist in decision making for pavement material type selection.
(Deprizon, 2009)	Knowledge based Flexible pavement Design	Flexible pavement Design (Malaysia)	KAL language based expert system designed to take decision in selection of flexible pavement rather than on expert using AI based software.	Several expert knowledge has been combined and fed into a AI drive system for taking decision to choose the design and material for flexible pavement. KAL language-based system.
(Lee *et al.*, 2009)	Knowledge based systems for travel time prediction	Intersections, Urban Road network (China)	Several design concepts and relationships between these concepts make up the TTP ontology, which was created in collaboration with a traffic domain expert.	A knowledge-based real-time travel time prediction model that includes historical and real-time predictors of journey times. It was used to data-mine traffic patterns from location-based service raw data and turn them into rules for travel time prediction.
(Mosa *et al.*, 2013)	Expert system to control construction problem in pavements	Highways	Provides decision making easy for the highway engineers to overcome the problem of highway construction by Knowledge base rules using GIS and weather data and traffic condition updates.	The ES-CCPFHP is utilised as a decision-making and knowledge-sharing tool, as a teaching tool for engineers or students of civil engineering, and as a repository for fundamental information and human expertise for all varieties of engineers in the study domain.
(Gong *et al.*, 2020)	Expert system to discover key congestion points	City scale	Applications for digital maps and spatial-temporal data derived from current traffic conditions	Study proves that key congestion points are not only due to bottleneck in the road scenario and it is not occurring at a particular time reflecting towards the non-recurrent congestion
(Park and Hong, 2022)	Traffic accident risk prediction using multimedia service	Accident data of 5 months (Seoul)	A model for predicting the risk of interrupted flow traffic accidents was built using the data obtained from Seoul.	The suggested knowledge-based technique offers the driver options by showing both the fastest and safest routes. It is very possible that inexperienced or elderly drivers favour safe routes over rapid ones.

Hence, the above-mentioned studies shows that the evolution of the knowledge-based systems as well as the artificial intelligence based expert systems that are widely used in the different applications of the transportation. Hence, these studies give rise to the conceptual map for the involvement of knowledge management in transportation, that shows the basic component of knowledge-based systems and Knowledge driven system.

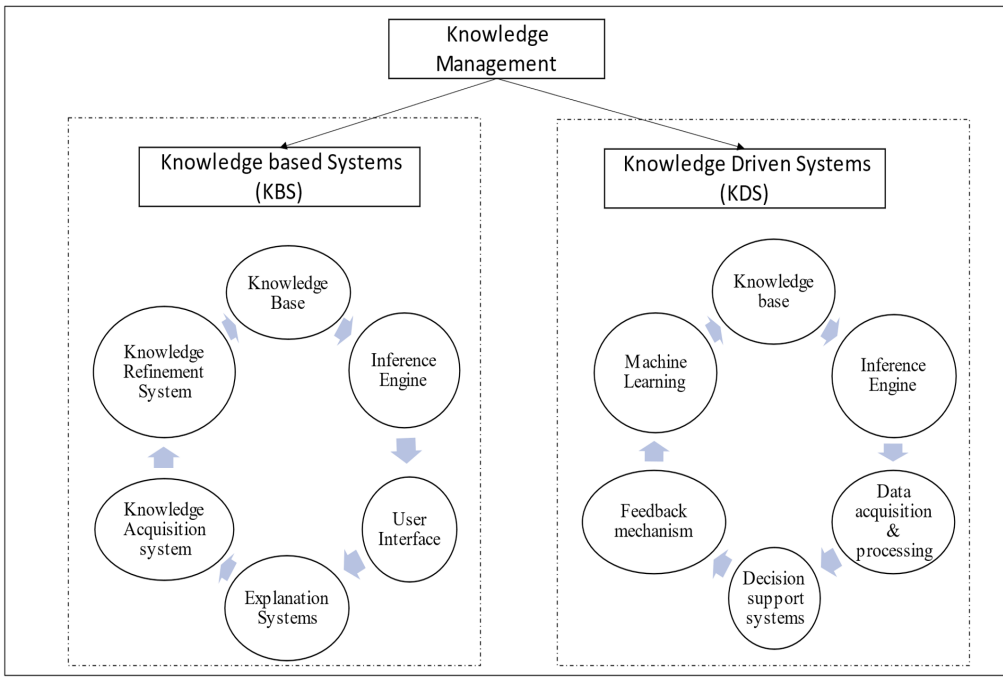

Figure 5: Concept Map of the Role of Knowledge Management in Transportation

Figure 5 shows conceptual map of the role of Knowledge management practices in transportation. Literature shows that knowledge management can be broadly classified into knowledge-based systems and Data driven systems.

Knowledge-based systems and Knowledge driven systems are both components of knowledge management in Transportation. Both knowledge-driven and knowledge-based artificial intelligence (AI) systems depend on knowledge to function. They still have different approaches to acquiring and applying knowledge.

Knowledge-based systems are created to address specific issues in each field. These systems make use of a pre-defined knowledge base that is composed of the domain's laws, knowledge, and heuristics. Experts in the field often build the knowledge base, which is used by the system to decide what to do and how to proceed. When there is a dearth of data and decision-making requires the application of expert knowledge, knowledge-based systems are frequently used.

Computer programmes known as knowledge-based systems employ information to solve issues or make decisions. A knowledge base, an inference engine, and a user interface are commonly used. KBSs can aid in the gathering, structuring, and dissemination of knowledge inside an organisation.

Knowledge-driven systems, (KDS) on the other hand, are intended to learn from experience and adapt

based on facts. These systems analyse data to find patterns and relationships using machine learning algorithms and other AI techniques. The system gets better at forecasting and making decisions as it processes more data. When there is a lot of data available and conventional rule-based systems are ineffective, knowledge-driven systems are frequently used. In conclusion, knowledge-driven systems learn and adapt based on data and experience, as opposed to knowledge-based systems, which rely on pre-defined knowledge to address problems.

Fundamentally, literature shows that the knowledge-based systems and knowledge driven systems in Transportation are basically based on the artificial intelligence and ranges from Expert systems for route planning, Intelligent transportation systems, Fleet management systems, Freight management systems, Advancement Passenger information systems, Air Traffic Control, Route Optimization, Autonomous vehicles, predictive Maintenance of pavements.

FINDINGS

The study finds that the knowledge-based expert systems are used in a lot of transportation mode and for multitasking. Expert systems and decision-making systems have been used in numerous areas, for interpretation, diagnosis, and execution, planning and layout, control and monitoring, and anomaly detection.

Although there are some parallels between Knowledge management and Knowledge based expert systems, their functions are different. The main goal of Knowledge management is to manage and make the most of an organization's knowledge assets to boost productivity and accomplish strategic objectives. On the other hand, Knowledge based expert systems are made to offer automated guidance or advise based on a particular body of knowledge and rules.

According to the study's findings, there are several applications of expert systems and knowledge management in the transportation sector that can work together to improve the efficiency of the transportation system.

a) Predictive maintenance: By accessing data on the performance of vehicles and infrastructure, knowledge management systems can help in identifying potential maintenance issues before they become serious issues. Expert systems may then automate the maintenance process, reducing downtime and enhancing fleet performance.

b) Route optimisation: Knowledge management systems can be used to gather and analyse information on traffic patterns, road conditions, and other variables that affect trip times. Then, using expert systems, routes that are economical with both time and fuel can be developed.

c) Safety management: By compiling and analysing data on mishaps, incidents, and near-misses, knowledge management systems can help in identifying potential safety concerns and establishing strategies for reducing them. By offering operators real-time guidance, the use of expert systems can then help to prevent accidents and improve general safety.

d) Consumer service: By collecting and evaluating data on consumer preferences, complaints, and feedback, knowledge management systems can help in the formulation of more effective service plans and improve customer satisfaction. Then, routine customer service tasks can be automated by expert systems, freeing up staff to focus on more challenging issues.

CONCLUSION

Knowledge management is an integral part of transportation that covers both widely known knowledge-based and knowledge-driven systems.

This study highlights the studies conducted in the past ranging from decision support systems to rule-based system and artificial intelligence-based expert systems. This study also shows that concept of knowledge management is not only limited to the primary Knowledge base, Inference engine and user interface but also, due to development in Artificial intelligence, the inclusion of probability-based, machine learning, online data acquisition & processing modules have been added during the period of 1985- 2022. Also, both the knowledge-based and expert systems provide safety and security and try to enhance the overall performance of the transportation networks, which shows that knowledge management positively influences transportation. The study attempts to give a holistic view of knowledge database evolution over the period of 37 years of knowledge management in vehicle. This study highlights that the application of knowledge management is wider than knowledge generation from tacit knowledge to explicit knowledge of the transportation experts. It also extends to knowledge discovery with the help of data mining tools for pattern generation and trend visualisation for the early onset of the occurrence of events. The study concludes that knowledge-based expert systems, however, can be an essential tool for Knowledge management because they can assist in capturing and codifying the knowledge of human experts in a way that makes it simple for others in the company to share and use. Organisations can increase productivity, reduce errors, and guarantee consistency in decision-making by utilising an expert system to record and automate the decision-making process.

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Sustainability Integration in Higher Education: Assessment of Policies, Curriculum, Research, Outreach and Campus Initiatives in India

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ABSTRACT

This study looks at how higher education advances sustainable development in India, with a focus on how policies, curriculum, research, outreach initiatives, and campus behaviors are all integrated. This research examines the situation of sustainable higher education in India today using a multi-dimensional approach, highlighting significant difficulties and possibilities. It analyzes the existing policies and frameworks that govern sustainability in higher education institutions and assesses their effectiveness in driving positive change. Furthermore, this paper investigates the integration of sustainability principles into the curriculum, highlighting innovative pedagogical approaches, interdisciplinary collaborations, and experiential learning opportunities. Additionally, it examines the research efforts and contributions of higher education institutions towards sustainable development, emphasizing the importance of knowledge creation and dissemination. The study also explores the outreach activities and community engagement initiatives undertaken by universities to foster sustainable practices beyond campus boundaries. Furthermore, this study sheds light on commendable campus initiatives that foster environmental stewardship, social accountability, and economic sustainability. By providing a comprehensive analysis and synthesizing best practices, this paper aims to guide policymakers, educators, and institutions towards effective strategies for embedding sustainability across all facets of higher education in India.

KEYWORDS

Digitalisation, Green issues, Integrated development, Research contribution, Community engagement

INTRODUCTION

In recent years, sustainability issues in higher education have garnered significant attention and concern from both the public and policymakers (Fiksel et al., 2012; Mickwitz & Melanen, 2009). As societies grapple with pressing environmental, social, and economic challenges, higher education institutions have been called upon to play a pivotal role in promoting sustainable development. This introduction sets the stage for exploring the

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importance of sustainability in higher education and the need for integrating sustainable practices into various aspects of academic institutions. The growing recognition of the critical role higher education plays in shaping future leaders, professionals, and change agents has sparked an increased focus on sustainability within the sector. Scholars, researchers, and practitioners have emphasized the significance of equipping students with the knowledge, skills, and values necessary to address the complex sustainability challenges faced by societies worldwide.

According to Fiksel et al. (2012), the pressing nature of sustainability concerns is underscored, emphasizing the crucial role of higher education institutions in promoting sustainable development. The authors emphasize the significance of incorporating sustainability principles into the fundamental purpose of universities and colleges, extending beyond conventional academic endeavors to address the wider societal and environmental landscapes in which they function. Mickwitz & Melanen (2009) further contribute to the discourse by stressing the need for transformative change within higher education to effectively tackle sustainability challenges. They argue that higher education institutions must move beyond token sustainability efforts and adopt a comprehensive approach that encompasses policies, practices, and curriculum that embed sustainability across disciplines.

The recognition of sustainability issues within higher education has led to a growing body of research and scholarship dedicated to understanding the various dimensions of sustainable development within academic institutions. This research aims to examine the integration of sustainability principles into policies, curriculum, research, outreach activities, and campus practices. By exploring these areas, scholars and practitioners seek to identify innovative strategies and effective practices for fostering sustainability within higher education. By integrating sustainability into policies, institutions can establish a framework that guides decision-making processes, governance structures, and resource allocation towards sustainable practices. Curriculum integration ensures that sustainability concepts and skills are incorporated across academic disciplines, cultivating a sustainability mindset among students and preparing them for sustainable careers.

Research efforts within higher education institutions contribute to knowledge creation and dissemination, addressing sustainability challenges through interdisciplinary collaborations, and providing evidence-based solutions. Outreach activities and community engagement initiatives extend the impact of higher education institutions beyond campus boundaries, fostering partnerships and collaborations with external stakeholders to promote sustainable practices in the wider community. The year 2022 marked a significant milestone in the global recognition and prioritization of Education for Sustainable Development (ESD). It was during the World Conference on Rio's Environment and Development summit that ESD emerged as a crucial approach to address the pressing sustainability challenges facing our planet. This introduction sets the stage for exploring the significance of ESD in promoting sustainable development and its implications for educational systems worldwide.

Education for Sustainable Development (ESD) has gained increasing recognition and importance in higher education institutions (HEIs) worldwide. The foundations of ESD can be traced back to significant declarations that outlined the integration of sustainability principles within the higher education

context. This introduction provides an overview of the early milestones in ESD, starting with the 1972 Stockholm Declaration and followed by the Talloires Declaration of 1990, highlighting their influence on sustainability issues in HEIs. The 1972 Stockholm Declaration stands as a groundbreaking moment in the global recognition of the need for sustainable development. While not explicitly focusing on education, it laid the foundation for future discussions and initiatives regarding sustainable practices. The proclamation stressed the need of taking environmental concerns into account and the need for international cooperation to address the problems caused by degradation of the environment.

With the implementation of the Talloires Declaration in 1990, a key turning point in the incorporation of sustainability into higher education was reached. Developed by the Association of University Leaders for a Sustainable Future (AULSF), this proclamation included a thorough 10-point action plan designed to address sustainability issues inside higher education institutions (HEIs) in an efficient manner. The plan covered a variety of topics, including outreach initiatives, campus operations, and teaching and research. It placed emphasis on HEIs' obligation to promote sustainable practices in the larger society and integrate sustainability concepts into all of their operations. Higher education institutions were greatly influenced by the Talloires Declaration to prioritize sustainability and take steps to include it. It offered a framework for development of projects, courses, and campus operations with a sustainability focus for universities and colleges. This important proclamation acted as a catalyst for change, inspiring organizations to adopt greener practices, take on more social responsibility, and work to address sustainability issues.

The Association of University Leaders for a Sustainable Future (AULSF) has been instrumental in promoting sustainable development within higher education. They have made it easier for HEIs throughout the world to exchange ideas, best practices, and resources thanks to their initiatives and teamwork. One of the results of the Talloires Declaration is the Talloires Network, a worldwide group of universities dedicated to advancing social and environmental sustainability.

POLICIES

In order to promote sustainable development and bring about positive changes in India, higher education must be integrated with policy. The importance of higher education for sustainable development is examined in this introduction, which also highlights the demand for efficient policy integration. This study seeks to clarify the function of higher education institutions in promoting sustainable development in India by looking at the current policies and their effects. Scholars, politicians, and practitioners are all paying attention to how policies and higher education might be combined to promote sustainable development. A framework for incorporating sustainability ideas and practices into academic programs, research pursuits, campus operations, and community involvement projects is established by the policies regulating higher education institutions.

To understand the impact of policy integration, it is important to examine existing policies and their effectiveness. One such policy is the National Policy on Education (NPE) of 2020, which emphasizes the need to reorient education towards sustainable development and addresses the challenges posed by environmental degradation, climate change, and social inequities. The NPE outlines the importance of

incorporating sustainability principles in curriculum design, pedagogical approaches, and research activities, aiming to produce graduates who are well-equipped to contribute to sustainable development goals. The National Action Plan on Climate Change (NAPCC) and the programs that are part of it also emphasize the importance of higher education institutions in tackling climate change issues. The NAPCC acknowledges the need to create curriculum that address climate change, support research into its adaptation and mitigation, and encourage sustainable activities on college campuses. Through these measures, higher education is brought into line with governmental agendas and environmental objectives.

The efficiency of policy integration in fostering sustainable growth within higher education institutions has been the subject of several research. For instance, Joshi and Chauhan's (2017) research looked into how policy changes in India affected how sustainability was included into higher education curricula. According to their results, policy frameworks can have a good impact on the inclusion of sustainability-related curricula and subjects, but more work is needed to improve the efficiency of policy implementation.

CURRICULUM, RESEARCH AND OUTREACH ACTIVITIES

A key component of incorporating sustainability into higher education is curriculum design. It offers a chance to provide students the information, abilities, and attitudes needed to tackle sustainability-related problems. Students' comprehension of sustainability concerns and their capacity to contribute to sustainable development goals may be improved through the inclusion of sustainability-focused courses, interdisciplinary learning opportunities, and experiential learning opportunities. Higher education institution research is essential to improving sustainable development. It advances innovation, knowledge development, and the use of reliable information in decision-making. Efforts to conduct research on issues connected to sustainability, such as renewable energy, climate change adaptation, and sustainable agriculture, can offer insightful analysis and practical answers to today's most urgent environmental and societal problems.

Outreach programs are crucial for higher education institutions to connect with the general public and encourage sustainable practices in addition to teaching and research. Partnerships with local communities, awareness campaigns, programs for strengthening capacity, and social entrepreneurship ventures are a few examples of outreach activities. Through these initiatives, universities may exchange knowledge, work with partners, and solve sustainability challenges outside of the campus. Several studies have explored the role of higher education in promoting sustainable development through curriculum, research, and outreach activities in the Indian context. For instance, research by Chatterjee and Das (2018) examined the integration of sustainability in the curriculum of management education programs in India. Their findings highlighted the importance of incorporating sustainability topics across various business disciplines and the need for faculty training and collaboration to enhance sustainability education.

Furthermore, research by Ghosh, Sengupta, & Bandyopadhyay (2017) investigated the impact of research activities in higher education institutions on sustainable development in India. Their study emphasized the need for collaborative research projects involving multiple stakeholders to address

sustainability challenges effectively.

SEEKING INTEGRATED DEVELOPMENT AT A TOP-TIER UNIVERSITY

Top-tier universities in India play a crucial role in promoting sustainable development by seeking integrated development across various dimensions. This introduction highlights the significance of higher education in advancing sustainability through an integrated approach that encompasses curriculum development, research initiatives, community engagement, and campus practices. By examining the efforts and practices of top-tier universities, this paper aims to shed light on the role of higher education institutions in fostering sustainable development in India. Top-tier universities are recognized for their academic excellence, research contributions, and societal impact. These institutions have the potential to drive sustainability by adopting an integrated approach that aligns various aspects of their operations with sustainable development goals. This includes incorporating sustainability principles into their curriculum, conducting impactful research, engaging with local communities, and implementing sustainable practices on campus.

The construction of curricula is essential to incorporating sustainability into higher education. The creation of multidisciplinary courses with a sustainability focus that provide students the information, abilities, and attitudes they need to handle sustainability concerns may be a leadership role for top institutions. These academic institutions make sure that graduates are well-equipped to support sustainable development in their areas by integrating sustainability into a variety of academic subjects. Leading institutions' research programs are essential for producing new ideas, information, and scientifically sound solutions to sustainability-related issues. These organizations frequently host research centers, institutes, and labs that focus on sustainability-related issues. Top-tier institutions support cutting-edge research in vital fields including sustainable agriculture, climate change adaptation, and renewable energy through multidisciplinary partnerships and collaborations with business and government.

Top-tier universities actively interact with local communities and stakeholders to promote sustainable development in addition to their curriculum and research. Initiatives aimed at addressing community needs and fostering sustainable practices outside of the campus include knowledge exchange programs, capacity-building exercises, and collaborative projects. These universities support regional and governmental sustainable development by utilizing their knowledge and resources. Furthermore, by establishing sustainable practices on their campuses, elite colleges operate as role models. They work to lessen their impact on the environment, encourage energy conservation, handle trash properly, and improve the general sustainability of their infrastructure. These institutions show their dedication to sustainable practices through programs including green building design, the use of renewable energy, and water conservation measures.

Numerous studies have looked at how premier universities may help India achieve sustainable development. For instance, study by Mathur & Patwardhan (2018) examined how one of the top universities in India was incorporating sustainability into its research, curriculum, and campus operations. Their research emphasized the value of multidisciplinary cooperation, stakeholder involvement, and institutional commitment in

attaining integrated sustainable development. Additionally, research by Sridhar and Raza (2020) explored the community engagement initiatives undertaken by top-tier universities in India to address sustainability challenges. Their study emphasized the significance of participatory approaches, local knowledge integration, and long-term partnerships in promoting sustainable development at the community level.

EXCELLENT UNIVERSITY: FOSTERING SUSTAINABIITY RESEARCH

Excellent universities serve as catalysts for sustainability research, playing a crucial role in generating knowledge and addressing sustainability challenges. These institutions prioritize interdisciplinary collaborations, innovative methodologies, and the application of research outcomes to real-world problems. By fostering sustainability research, excellent universities contribute to the development of sustainable solutions, policies, and practices that can address pressing environmental, social, and economic issues. The promotion of sustainability research within higher education institutions is supported by various initiatives and programs. One notable initiative is the establishment of dedicated research centers or institutes focused on sustainability, climate change, or environmental studies. These centers provide a platform for researchers to collaborate, conduct impactful research, and disseminate their findings to diverse stakeholders. They also facilitate partnerships between academia, industry, government, and local communities to foster sustainable development.

In addition to research centers, funding opportunities and grants specifically aimed at sustainability research play a crucial role in promoting excellence in higher education. These financial resources enable researchers to pursue innovative projects, gather data, conduct fieldwork, and engage in collaborative research endeavors. They provide the necessary support for universities to attract and retain talented researchers dedicated to sustainability issues. Several studies have examined the role of excellent universities in promoting sustainability research in India. For example, research by Jain and Sharma (2018) investigated the contributions of a leading Indian university towards sustainability research and the implementation of sustainable practices on campus. Their study highlighted the importance of research collaborations, international partnerships, and institutional commitment in advancing sustainability within the university context.

Furthermore, research by Singh and Sharma (2019) explored the role of excellent universities in sustainable development through research activities in the field of renewable energy. Their study emphasized the significant contributions made by these institutions in developing renewable energy technologies, policy recommendations, and sustainable energy practices.

ORDINARY UNIVERSITY: SOLVING PRACTICAL GREEN ISSUES

Ordinary universities in India play a significant role in promoting sustainable development by actively engaging in solving practical green issues. This introduction highlights the importance of higher education in advancing sustainability through practical approaches that address environmental challenges faced by local communities and society as a whole. By examining the efforts and practices of ordinary universities, this paper aims to shed light on the role of higher education institutions in fostering sustainable development in India. Ordinary universities provide

substantial resources and knowledge that may be used to address real-world ecological concerns, while not having the elite prestige of top-tier schools. These organizations provide a strong emphasis on workable solutions and neighborhood-centered strategies that directly support sustainability at the local level. Ordinary universities have the ability to significantly impact the promotion of sustainable development by utilizing their academic expertise, research capacity, and local connections.

Engaging in relevant research and innovation to solve environmental challenges is one important way that regular universities may contribute to sustainable development. To identify and address particular environmental concerns, these universities frequently work in partnership with regional communities, non-governmental organizations (NGOs), and governmental institutions. Ordinary universities offer workable answers to urgent environmental issues through applied research initiatives including waste management, water conservation, renewable energy technologies, and sustainable agricultural methods. Ordinary universities also place a high priority on outreach and community involvement initiatives that actively assist local communities. These organizations actively include local residents in sustainability projects by asking for their opinions and involvement. Ordinary universities enable communities to embrace sustainable practices and solve regional environmental challenges through capacity-building initiatives, workshops, and knowledge-sharing platforms.

The creation of curricula is an essential part of the promotion of sustainability in conventional universities. These educational establishments include sustainability concepts into their curricula and academic programs to guarantee that graduates have the know-how and abilities to support sustainable development. Normal institutions equip students to take on environmental concerns and apply sustainable solutions in the workplace by providing hands-on, industry-relevant training. Additionally, ordinary universities are essential in educating students, professors, and the general public about sustainability-related concerns. They organize sustainability-related conferences, seminars, and workshops, establishing forums for debate and information sharing. These institutions encourage people to be change agents and contribute to sustainable development outside of the classroom by cultivating an environment-conscious culture.

Several studies have looked at how common institutions might support sustainable development in India by tackling real-world environmental concerns. For instance, study by Ahmed, Shafiq, and Azam (2020) investigated how a typical Indian university contributed to the implementation of real-world sustainable solutions for waste management and renewable energy. In order to effectively handle real-world green concerns, their study emphasized the value of multidisciplinary cooperation, stakeholder involvement, and practical training. Additionally, a study by Gupta, Goyal, & Singh (2018) looked at the community involvement efforts made by a typical university in India to address real-world environmental problems. Their research stressed the need of working with regional communities, forming alliances, and promoting sustainable practices at the local level.

CAMPUS PRACTICES

Campus policies are essential in encouraging sustainable growth in India's higher education institutions. This introduction emphasizes the

importance of sustainable campus practices and their influence on resource management, environmental stewardship, and overall sustainability. This research intends to shed light on the function of campus practices in promoting sustainable development in India by investigating the initiatives and practices of higher education institutions. Higher education institutions serve as microcosms of society, and the campus policies they uphold directly impact the surroundings and the general wellbeing of the neighborhood. These institutions may demonstrate their dedication to environmental responsibility and function as role models for sustainable development by implementing sustainable practices on their campuses.

The effective management of resources is a crucial component of sustainable campus activities. This includes actions like trash minimization, sustainable transportation, water management, and energy saving. Higher education institutions may dramatically lessen their environmental effect and support sustainable resource management by embracing renewable energy sources, deploying energy-efficient technology, and encouraging water conservation measures. Furthermore, waste management plans that put an emphasis on recycling, composting, and trash reduction are part of sustainable campus practices. Institutions may reduce the quantity of garbage transported to landfills and advance a circular economy by putting in place efficient waste management systems, including segregation and recycling programs. These activities support a culture of environmental awareness among students, professors, and staff in addition to promoting environmental sustainability.

Creating healthy and ecologically friendly learning spaces is another aspect of sustainable campus activity. This entails using green construction practices, encouraging the quality of indoor air, and increasing natural lighting and ventilation. Institutions may improve the wellbeing and productivity of their campus community while minimizing their ecological imprint by creating and maintaining eco-friendly structures. Universities may also encourage the implementation of sustainable food systems on their campuses. This entails supporting vegetarian and vegan alternatives, encouraging locally grown food, and reducing food waste. Institutions may help local farmers, lessen greenhouse gas emissions related to food transportation, and encourage better, more sustainable dietary choices by implementing sustainable food practices.

Several studies have examined the role of campus practices in promoting sustainable development in higher education institutions in India. For example, research by Shrivastava and Shrivastava (2017) investigated the sustainable practices implemented by a leading Indian university, including energy conservation, waste management, and sustainable transportation. Their study highlighted the importance of institutional commitment, stakeholder involvement, and awareness-raising campaigns in achieving sustainable campus practices. Additionally, research by Raju, Sudhakar, & Sahoo (2019) explored the sustainable campus practices implemented by various higher education institutions in India. Their study emphasized the significance of policy frameworks, infrastructure investments, and student engagement in fostering sustainable campus practices and promoting a culture of sustainability.

TOP-TIER UNIVERSITY FOR GREEN COVERAGE

Top-tier universities in India play a pivotal role in promoting sustainable development by taking

a leadership position in implementing green coverage practices. This introduction highlights the significance of higher education institutions in driving sustainability initiatives through the development and maintenance of green spaces on their campuses. By examining the efforts and practices of top-tier universities, this paper aims to shed light on their role as leaders in promoting sustainable development in India. Green coverage practices refer to the deliberate creation and preservation of green spaces within university campuses. These spaces encompass gardens, parks, green roofs, vertical gardens, and tree plantations. The integration of green coverage practices not only enhances the aesthetic appeal of campuses but also offers a range of environmental, social, and economic benefits.

One of the key advantages of green coverage is its positive impact on environmental sustainability. Green spaces provide a multitude of ecosystem services such as carbon sequestration, air purification, and temperature regulation. Top-tier colleges and universities may help to slow down climate change, improve air quality, and lessen the impact of urban heat islands by increasing the amount of green space on their campuses. Additionally, by creating habitats for a variety of plant and animal species, green covering methods promote biodiversity conservation. By preserving native plants and animals, sustaining ecological balance, and encouraging environmental responsibility among campus residents, this biodiversity increase helps the university community. Additionally, there are several social advantages to having green spaces on college campuses. They operate as gathering places where people may unwind, have fun, and socialize, improving the general wellbeing and mental health of students, teachers, and staff. These areas offer chances for exercise, stress relief, and connection with nature, fostering an environment that is favorable to learning and individual development.

Additionally, there are financial benefits to using green coverage practices. By drawing in potential students, professors, and research partnerships, they raise the commercial worth of the university campus and the neighborhood. Additionally, green spaces can serve as living laboratories for research and educational purposes, facilitating interdisciplinary studies and practical learning experiences. Several studies have examined the role of top-tier universities in promoting sustainable development through their green coverage practices in India. For instance, a study explored the green coverage initiatives undertaken by a leading Indian university and their impact on environmental sustainability and student well-being. Their study emphasized the importance of strategic planning, stakeholder engagement, and sustainable landscape management practices in achieving successful green coverage. Additionally, a study highlighted the positive correlation between green spaces, property value, and the overall desirability of the university, reinforcing the economic advantages of investing in green coverage.

EXCELLENT UNIVERSITY IN INDIA: CHAMPION OF ENERGY CONSERVATION

Excellent universities in India play a crucial role in promoting sustainable development by championing energy conservation practices within their campuses. This introduction highlights the significance of higher education institutions in driving sustainability initiatives through effective energy conservation strategies. By examining the efforts and practices of excellent universities, this paper aims to shed light on their role as leaders in promoting sustainable

development in India through energy conservation. Energy conservation practices encompass a wide range of strategies aimed at reducing energy consumption, optimizing energy efficiency, and promoting the use of renewable energy sources. By putting these strategies into reality, good institutions not only lessen their environmental effect but also save money, raise environmental awareness, and set an example for sustainable energy management.

The adoption of energy-efficient technology and infrastructure is a crucial component of energy conservation in colleges. This covers the use of energy-saving equipment and appliances, intelligent building automation, effective heating, ventilation, and air conditioning (HVAC) systems, and lighting systems that consume less energy. By adopting these technologies, excellent universities can significantly reduce their energy consumption and greenhouse gas emissions while creating a sustainable and comfortable learning environment. Several studies have examined the role of excellent universities in promoting sustainable development through their energy conservation practices in India. For instance, research by Jain, Sharma, and Pathak (2019) explored the energy conservation initiatives implemented by a renowned Indian university and their impact on energy efficiency and environmental sustainability. Their study highlighted the importance of energy audits, stakeholder engagement, and technological innovation in achieving significant energy savings and greenhouse gas reductions.

Additionally, a study investigated the renewable energy adoption practices of excellent universities in India. Their study emphasized the positive environmental and economic outcomes of integrating renewable energy sources within university campuses, contributing to sustainable energy management and reducing reliance on conventional energy sources.

ACTIVE PARTICIPANT IN CAMPUS SUSTAINABILITY: ORDINARY UNIVERSITY

Ordinary universities in India play an active role in promoting sustainable development by becoming participants in campus sustainability initiatives. This introduction highlights the significance of higher education institutions in driving sustainability efforts, even with limited resources and infrastructure. By examining the efforts and practices of an ordinary university in India, this paper aims to shed light on its role as an active participant in campus sustainability, contributing to sustainable development. Campus sustainability encompasses a range of initiatives aimed at reducing environmental impact, promoting resource conservation, and fostering sustainable practices within university campuses. While ordinary universities may face challenges in terms of financial constraints and limited infrastructure, they can still make significant contributions towards sustainability by adopting practical and feasible approaches.

One key aspect of campus sustainability in ordinary universities is the implementation of resource conservation measures. This includes strategies such as energy conservation, water management, waste reduction, and sustainable transportation. By implementing energy-saving measures, such as efficient lighting systems and HVAC optimization, ordinary universities can significantly reduce their energy consumption and greenhouse gas emissions. Water management initiatives, such as rainwater harvesting and efficient irrigation systems, can help conserve water resources. Waste reduction programs, including recycling and composting, can minimize the environmental impact of waste generation. Promoting eco-friendly transportation

alternatives, such as advocating for cycling and public transportation, can effectively mitigate carbon emissions arising from daily commutes.

Additionally, the ordinary university actively engages students, faculty, and staff in sustainability initiatives through awareness campaigns and educational programs. By promoting sustainability literacy and encouraging behavior change, the institution cultivates a culture of environmental responsibility among its community members. This includes raising awareness about sustainable practices, organizing workshops and seminars, and integrating sustainability-related topics into the curriculum. By fostering a sense of environmental stewardship, the ordinary university empowers individuals to actively contribute to campus sustainability efforts. Furthermore, the ordinary university collaborates with local communities and stakeholders to extend its sustainability impact beyond campus boundaries. This include participating in community outreach programs, forming partnerships with regional businesses, and funding regional efforts to promote sustainable development. The typical institution becomes an active contributor to larger sustainability initiatives by addressing community needs and supporting sustainable practices in the local setting.

Several studies have looked at the function played by typical universities in campus sustainability. For instance, a study by Gupta, Goyal, and Singh (2018) examined community involvement activities made by a typical institution in India to address real environmental concerns. Involving the neighborhood and building partnerships are crucial for producing successful sustainability results, as their case study demonstrated. Additionally, a study looked into the campus sustainability policies of typical Indian institutions. In spite of budget constraints, their study stressed the need of sustainable infrastructure, stakeholder involvement, and behavior change in fostering campus sustainability.

CONCLUSION

This study examined how higher education might aid in the promotion of sustainable development in India, paying particular attention to how policies, curricula, research, outreach initiatives, and campus customs can all be integrated. The study has offered insights into the current situation of sustainable higher education in India through a thorough and multi-dimensional approach, finding important issues and possibilities that need to be addressed. The usefulness of these strategies in bringing about positive change has been made clear by the examination of the current frameworks and rules controlling sustainability in higher education institutions. It has brought attention to the requirement for strong, well executed regulations that support and reward sustainable practices on campuses.

The investigation of the curriculum's incorporation of sustainability concepts has highlighted the significance of cutting-edge pedagogical strategies, multidisciplinary partnerships, and experiential learning opportunities. These results underline how important it is to provide students the information, know-how, and attitude they need to tackle sustainability issues and support sustainable development. The importance of knowledge generation and distribution has been highlighted by an analysis of research initiatives and contributions made by higher education institutions to sustainable development. It has demonstrated the need for increased research activities that focus on finding sustainable solutions to pressing environmental, social, and economic issues.

The exploration of outreach activities and community engagement initiatives undertaken by universities

has highlighted the importance of extending sustainable practices beyond campus boundaries. This engagement with the wider community and collaboration with external stakeholders can have a significant impact on fostering sustainable practices and addressing local sustainability issues. Furthermore, the research has presented noteworthy examples of campus practices that advance environmental sustainability, social responsibility, and economic viability. These best practices serve as models for other institutions, demonstrating the feasibility and benefits of adopting sustainable measures.

By providing a comprehensive analysis and synthesizing best practices, this research paper aims to guide policymakers, educators, and institutions in their efforts to embed sustainability across all facets of higher education in India. It underscores the importance of strategic planning, collaboration, and the implementation of effective strategies to promote sustainable development within the higher education sector. Ultimately, through the integration of policies, curriculum, research, outreach activities, and campus practices, higher education institutions in India can become powerful drivers of sustainable development. By embracing sustainability as a core value and enacting meaningful changes, these institutions can contribute to a more sustainable future for India and the world as a whole.

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Visualising a Unique Education System to Meet Global Education Standards: An Exploratory Study

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ABSTRACT

Education is the cornerstone of any society, and providing students with a top-notch education system is paramount for developing and sustaining a prosperous future. However, designing an education system that meets the ever-evolving standards at a global level can be far from easy. This research paper discusses how best to visualise a unique education system that caters to individual needs and meets a global benchmark. Creating a comprehensive educational environment allows each student's knowledge and skillset to expand beyond imaginable parameters while keeping pace with international demands is possible. This paper also formed the basis of a new education system internationally, resulting in improved student performance and satisfaction. It analyses successful education models to identify best practices necessary to create an effective, equitable education system. A unique framework that emphasises critical thinking, problem-solving, collaboration and future-relevant skills such as digital literacy should be developed. Relevant investments in resources, technology, infrastructure and personnel are essential for successful implementation. Finally, the National Education Policy 2020 aims to meet global standards by increasing research intensity and promoting digital technologies in Indian universities.

KEYWORDS

Best Practices, Increased engagement, National Education Policy 2020, Successful models, Quality Control

INTRODUCTION

A unique education system should equip students with the skills and knowledge required to meet global standards. This can be done by creating a comprehensive curriculum that develops key 21st-century skills such as problem-solving, critical thinking, creativity, collaboration, communication, and digital literacy. This curriculum must be engaging and interactive to keep students motivated and interested in their studies. Technology-based learning resources should also be provided for both teachers and students to help support their learning needs (Liu et al., 2019). In addition, schools should strive to create an inclusive environment

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where all students feel valued regardless of cultural background or beliefs. This includes providing access to extracurricular activities such as sports or after-school programmes that promote team building and physical activity (Opstoel et al., 2020). Moreover, schools should create a safe and secure learning environment by implementing clear disciplinary policies (Abdel-Basset et al., 2019).

The unique education system must consider the changing needs of society and the global economy. For example, students must be prepared for an increasingly digital world with access to technology-based instruction or job skills for highly in-demand professions (Liu et al., 2019). Similarly, schools should provide students with various career pathways that help develop critical 21st-century job skills such as data analysis or robotics engineering. This will make them successful workers in the increasingly competitive global economy. By providing these opportunities, students can gain valuable life experience, which will help them become quality citizens within their communities while also helping them reach their personal goals (Spring, 1998).

When designing a unique education system, it is essential to consider these aspects to meet global education standards (Verger et al., 2018). By considering students' specific needs and requirements, schools can provide an engaging and comprehensive learning experience that equips them with the skills needed for success. This will ensure that more students have access to quality education that prepares them for the future. Also, students will be more likely to be successful citizens within their communities while helping them become quality workers in the global economy (Schwab et al., 2021).

Understanding the skills and knowledge required to meet global education standards

The world of education is constantly evolving, and it is essential to stay informed about the current global standards. To succeed in this rapidly changing landscape, one must possess the necessary skills and knowledge to meet these standards. As we delve deeper into the 21st century, it becomes clear that education is more than just obtaining good grades. The true measure of a successful education is the ability to think critically, adapt to new situations, and collaborate with others. By embracing these values, we can equip ourselves with the tools necessary to excite and thrive in a world filled with possibility (Verger et al., 2018).

The global standard of education means that people worldwide should have the same skills and knowledge. This means that everyone learns the same things. It also means that the same set of standards judges everyone, and therefore, everyone has an equal chance of success. This encourages people to strive for excellence and makes it easier for employers to compare potential employees. Furthermore, having a global standard of education also enables international collaboration, as knowledge can be easily transferred between different countries. Geographical boundaries should no longer limit education (Sadeghi, 2019). The world can benefit from shared educational resources and experiences across different continents. A global standard of education will ensure that all students receive a quality education regardless of where they are. This could lead to greater social development, economic prosperity, and cultural understanding. By embracing a global standard of education, we can provide countless opportunities for people worldwide and help create a brighter future (Madani, 2019).

As such, a global standard of education will create a more equitable society and reduce educational inequality. This could lead to increased access to higher-quality education for those who might not otherwise have it and improve educational outcomes

across all demographics (Sadeghi, 2019). Likewise, this will help bridge the gap between privileged and underprivileged communities by providing similar resources and opportunities. A level playing field can be created, which allows anyone to excel if they put in the hard work. Ultimately, this could improve our world by promoting social mobility, economic growth, and cultural understanding among different societies. By adopting a global standard of education, we can create a more equitable and prosperous future (Madani, 2019).

Acknowledging the challenges and weaknesses of current educational system

Education is a vital component of our lives, and the systems we have in place must be comprehensive and effective. However, many regions across the world struggle with significant challenges and weaknesses when it comes to their educational programmes (Li et al., 2020). Coupled with issues like insufficient funding, a shortage of skilled teachers, and outdated infrastructure, the lack of access for students to quality education is a crisis that needs to be addressed urgently (Li et al., 2020). The future of our society hinges on the success of our educational systems, and we must acknowledge the challenges that exist today to take concrete steps towards improvement. It is time to take a serious look at the state of education across the globe and work towards a better tomorrow for our students (Care et al., 2018).

This research paper formed the basis of a new education system implemented in several countries. The results were encouraging, with improved student performance in reading and maths. Besides, students reported increased engagement in their studies and greater satisfaction with the educational process due to the new system. This success has led to the further expansion of this innovative education approach across more countries worldwide. Going forward, it is hoped that this new educational model will continue to yield positive results for many learners and contribute to a better future for all (Care et al., 2018).

However, it is essential to note that this new system does not come without challenges. In particular, there can be a lack of buy-in from educators and other stakeholders in the educational process. Ensuring that these stakeholders are engaged in the process and understand its benefits is essential for its successful implementation and ongoing adoption (Small et al., 2017). Furthermore, continued evaluation of student outcomes is necessary to ensure that the system remains effective and responds appropriately to changing contexts. Despite these challenges, this innovative approach to education has the potential for further success as more countries consider incorporating it into their curricula (Verger et al., 2018).

Overall, the new educational system has demonstrated encouraging results and provides a promising model for future improvements in education worldwide (Schwab et al., 2021). With adequate support from stakeholders and continued evaluation of student outcomes, this innovative approach can potentially provide improved educational experiences for many learners—a bright future for all (Small et al., 2017). Countries must continue to evaluate and enhance their education systems to ensure students receive the best possible learning experience (Madani, 2019). With continued efforts and the application of innovative approaches such as the new system, we can move closer to achieving our goal of equal access to quality education worldwide. Only then can we genuinely create brighter futures for everyone.

Analysing successful models of education to identify and learn from best practices

To effectively educate students, it is crucial to

understand and analyse successful education models in different systems. By examining the best practices of these models, educators can adapt and implement successful strategies into their teaching methods (Scull et al., 2020). It is vital to approach this task seriously, as education is fundamental to shaping the future generation. As such, educators must strive to constantly improve and innovate their teaching practices to produce the best student results. By prioritising the analysis of successful education models, we can work towards creating a more effective and equitable education system for all (Casey, 2013). One successful education model is the Finnish system. Finland has consistently ranked high in international education assessments, and their approach revolves around putting the needs of students first (Niemi, 2016). In Finland, students receive high support and individual attention, with a strong emphasis on well-being and equal opportunities. Teachers are highly trained and respected, focusing on continuous professional development, and there is a culture of trust between educators, students, and parents (Niemi, 2016).

Another successful model is the Japanese system. Japan is known for its rigorous curriculum and focus on discipline, emphasising hard work and perseverance (Cummings, 2014). Students are expected to take responsibility for their learning, and there is a strong emphasis on respect for authority and tradition. Teachers are highly respected, with a culture of lifelong learning and a commitment to constant improvement (Cummings, 2014). In addition to Finland and Japan, there are many other successful education systems worldwide, each with unique approaches and strengths. By learning from these models, we can identify best practices and apply them in our contexts, ultimately improving education for all students.

Developing a framework for a unique education system that can better equip students

In an ever-changing world, equipping students with the skills and knowledge they need to succeed is more important than ever. A unique education system can provide this foundation for young learners by offering a comprehensive framework emphasising critical thinking, problem-solving, and collaboration. Such a system would also integrate technology and practical application into the curriculum, ensuring students have the tools to thrive in the 21st century (Abdel-Basset et al., 2019). This unique education system can set them up for success inside and outside the classroom by fostering a love for learning and empowering students to explore their passions. Developing an effective education system that provides students with essential skills and knowledge is crucial for their future success. A unique education framework must be designed considering factors such as the current education landscape, global trends, and the needs of the students. This education framework should focus on personalised learning methods, critical thinking abilities, and practical experience to equip students with essential skills and knowledge (Liu et al., 2019).

Personalised learning can be implemented through adaptive learning technology or student-centred project-based learning. By personalising the learning experience, students can have more control over their education and focus on what they need to learn (Sadeghi, 2019). Critical thinking abilities can be honed through collaborative problem-solving, debates, and analysing complex scenarios. Practical experience can be gained through work-based learning opportunities, internships, and apprenticeships. These methods can bridge the gap between academic learning and real-world experience (Schwab et al., 2021). Incorporating future-relevant skills such as digital literacy, creativity, and communication skills

into the education framework is also important. This can be achieved through STEAM (science, technology, engineering, arts, and mathematics) programmes that blend academic knowledge with practical application (Shatunova et al., 2019). These skills are essential for students to succeed in an ever-changing global job market and to contribute to society.

Implementing measures to ensure quality control

There is no room for error when it comes to ensuring quality control. Failing to implement proper measures can lead to financial and reputational consequences. This is why assessments, monitoring, and evaluation are critical components of any quality control process (Elassy, 2015). These measures help identify any issues or problem areas early on, allowing for prompt corrective action. It is a serious responsibility requiring unwavering attention to detail and a constant willingness to improve. By prioritising quality control and taking proactive steps to assess, monitor, and evaluate processes, institutions can safeguard their success and ensure the satisfaction of their stakeholders. To ensure quality control in education, it is essential to implement various measures such as assessments, monitoring, and evaluations. These measures can help identify the educational system's strengths and weaknesses and pinpoint areas that require improvement. Through regular assessments, educators can identify students who may be struggling and provide them with the necessary support to help them succeed. Monitoring educational programmes can help track progress and ensure goals are met. Evaluations can provide critical feedback and guide future improvements (Mukhopadhyay, 2005).

Assessments can take many forms, from traditional tests and exams to more innovative methods such as project-based assessments or performance evaluations. By using various assessment methods, educators can gain a more comprehensive understanding of student learning and provide tailored support to help them reach their full academic potential (Elassy, 2015). Monitoring educational programmes involves collecting and analysing data to track progress and identify any areas of concern. This can include monitoring student attendance, test scores, and other metrics to ensure educational programmes meet their goals. Educators can quickly identify issues and take corrective action to improve educational outcomes by regularly monitoring educational programmes (Veenman, 2016). Evaluations are an essential tool for quality control in education. Through evaluations, educators can gather feedback from students, parents, and other stakeholders to gain insights into what is working well and what needs improvement. Evaluations can provide critical feedback on curriculum, instructional methods, and other aspects of education, which can help improve the educational system's overall quality (Elassy, 2015).

Investing in resources, technology, infrastructure, and personnel

As any business owner or manager knows, implementing a new system can be daunting. Nevertheless, while making a change may be difficult, investing in the resources, technology, infrastructure, and personnel necessary to support that change cannot be overstated (Doner et al., 2016). A new system can be the key to unlocking efficiency, productivity, and profitability breakthroughs, but only if given the support it needs. By making the necessary investments, you can ensure a smoother implementation process and set your organisation up for success in the long term. So, while it may require a significant investment upfront, the payoff can be enormous (Doner et al., 2016).

It is crucial for educationists to transform the educational system by investing in resources,

technology, infrastructure, and personnel (Scull et al., 2020). To achieve the envisaged educational reforms, it is imperative to ensure that the necessary support systems are in place. One such critical area that educationists need to focus on is technology. Embracing technology in education is no longer an option, but a necessity, to improve the quality of learning outcomes. Today's learners are digital natives who require digital solutions to enhance their learning experiences (Abdel-Basset et al., 2019). Infrastructure is another crucial consideration if the new educational system is to be successfully implemented. Lack of adequate infrastructure is a significant challenge in many parts of the world, particularly developing countries (Porter et al., 2016).

For instance, rural areas may lack proper transport links, making it challenging for learners to access schools. Lack of basic utilities such as clean water and electricity can also disrupt learning activities (Porter et al., 2014). Hence, educationists must invest in infrastructure as a prerequisite for the success of a new educational system. Personnel, including teachers, support staff, and administrators, are central to any educational system. Investing in personnel involves providing adequate training, support, and development opportunities to equip them with the necessary skills and knowledge to deliver quality education. In particular, teachers are critical players in implementing the new educational reforms, and their professional development should be a top priority (Porter et al., 2016).

What is the NEP 2020 doing to meet global education standards in India?

The National Education Policy 2020 is committed to transforming the education system in India and pushing forward to meet global standards (MoE, 2020). It seeks to make Indian higher education institutions among the top 200 universities globally by 2030 (Kumar et al., 2021). It has outlined several reforms in six key areas:

i. Access,

ii. Equity,

iii. Quality,

iv. Governance,

v. Financing, and

vi. Accountability.

The policy focuses on increasing research intensity in higher educational institutions and prioritising interdisciplinary studies to achieve these objectives. It aims to ensure that students have opportunities for hands-on learning experiences and get exposure to industry practices at all levels of their education (MoE, 2020). The policy also envisions setting up new autonomous degree-granting colleges, such as liberal arts universities or teaching universities, where faculty can pursue independent research agendas (MoE, 2020). The policy wishes to promote the use of digital technologies in classrooms and make learning more interactive. It has proposed an ambitious programme called *National Mission on Education through ICT*, enabling access to quality educational content through the Internet, radio, television and mobile phones (MoE, 2023). The policy seeks to increase enrolment rates in higher education by improving infrastructure facilities in universities and colleges and making them more financially accessible to students from all economic backgrounds (Harindranathan, 2020).

Finally, the policy is committed to enhancing the accountability of educational institutions and ensuring that they adhere to standards set by regulatory bodies like the University Grants Commission (UGC). To this end, it proposes the creation of a National Accreditation Authority for Higher Educational Institutions (NAAHEI), which will be responsible for assessing the quality of education delivered in institutions (Kumar et al., 2021).

What should Indian universities do in 2024?

Indian universities must prioritise the development of research-based teaching and learning (Chidambaram, 1999). They must invest in creating a culture of inquiry and innovation. This should not just be limited to traditional forms of research but also include experiential learning and interdisciplinary collaborations (Varughese et al., 2020). Universities should also focus on improving the quality of faculty members by providing faculty development programmes that focus on nurturing innovative teaching practices, mentorship, and ongoing research (Sahoo et al., 2017). Additionally, Indian institutions should offer state-of-the-art infrastructure to support faculty activities and create quality assessment systems for evaluating teaching standards (Anand et al., 2018). It is equally essential for Indian universities to pay attention to developing industry linkages through greater collaboration with corporate partners and international academic institutions (Varughese et al., 2020). This will enable universities to share best practices, create joint research projects, and enhance the overall quality of teaching (Sahoo et al., 2017).

Finally, Indian universities must prioritise student welfare initiatives by actively engaging with their students' unions and creating a safe learning environment on campus (Pathania, 2018). This will ensure that students are more likely to pursue higher education in India as they know they will receive support from the institution beyond just academics. By embracing all these changes, Indian universities can become an integral part of the global academic landscape. Indian universities should also strive to meet international academic administration and governance standards by investing in transparent systems for faculty recruitment, evaluation, and promotion; developing robust online course management systems for instructors; and implementing efficient administrative processes (Palvia et al., 2018). This will help universities keep up with the latest changes in the global academic landscape and ensure they remain competitive. Indian universities should also focus on creating a culture of openness and collaboration within the institution to encourage faculty to share their ideas and be innovative in their teaching approach (Sahoo et al., 2017).

CONCLUSION

It is clear to see the necessity of reform in the education system. The current circumstances demand us to create a unique educational system suitable for this age and equip students with the necessary skills and knowledge to meet global standards. It is both an obligation and an opportunity for all stakeholders to develop a system that enables students to enjoy rewarding learning experiences. The key is to draw inspiration from different successful models, eliminate fundamental problems in these systems, and integrate them into a comprehensive education framework.

Proper measures must be implemented to ensure quality control, including assessments, monitoring, and evaluation, supporting the new system's implementation process. Nonetheless, equipping students with any new education system requires substantial investments in resources, technology, infrastructure and personnel, which should not be underestimated (Anand et al., 2018). Above all else, implementing successful change within the educational sector can undoubtedly positively impact children's academic achievements now and in generations beyond them.

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Entrepreneurial Resilience: A Case Study of Digital Gurukul

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SUMMARY

Raj Padhiyar aspired to be an entrepreneur at a very young age. After experimenting with various businesses, he decided to enter the EdTech industry after analyzing the industry's demand for digital skills. Digital Gurukul had grown rapidly since its inception in 2014. With 44850+ students from all over the world, 120+ news media mentions, and 20+ awards, including Asia's Best Digital Institute, Digital Gurukul has been named Asia's leading EdTech Company for its flagship Diploma Program in Digital in a short span of 7 years. The road from 0 to 1 was fraught with difficulties and setbacks, as formidable opponents surrounded him. Raj had always focused and developed resilience to become successful in the face of failure, rejection, challenges, and setbacks, and this is how he had learned to grow from them, becoming a better version of himself along the way. Digital Gurukul began with crash courses and had since expanded to diploma and advanced diploma courses for students, working professionals, and women. Digital Gurukul held a commanding position in Gwalior and the surrounding cities. Yet, it was facing stiff competition from its rivals in the growing EdTech industry. However, encouraged by his early success, Raj planned to expand its operations both domestically and internationally. He was attempting to secure funds from large investors while also welcoming franchisees from the domestic market. It was a challenge for him. The case discusses the feasibility of expansion both domestically and internationally amongst the abundance of opportunities and challenges in the industry.

INTRODUCTION

Digital Gurukul was set up by Raj Padhiyar, 35 years old an MBA graduate from Mumbai at Gwalior in 2014. Before setting up this venture, he had worked in Yes Bank for two years. Not satisfied with the job of a banker and having a strong passion to set something of his own, he resigned from his job and started his venture in tours and travels but the venture did not take off well and he hadto close it down. Then, he tried his hands at several other small setups but ended up in closing them down. His family, which had initially supported him, backed and advised him to take up the job. Raj in spite of his failures did not give up due to his entrepreneurial spirit. He decided

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to leave his home town and landed up in Gwalior without any mentor, legacy, or moral support.

In 2013, Government of India launched Digital India Campaign, to ensure the Government's services are made available to citizens electronically by improved online infrastructure and Internet connectivity to make the country digitally empowered in the field of technology. The initiative included plans to connect the country with high-speed internet networks. It consisted of three core components: the development of secure and stable digital infrastructure, delivering government services digitally, and universal digital literacy. These emerging opportunities made Raj think of digital education and setting up an institution for the same. It was not a simple task. He had to depend exclusively on his savings, which he was able to save during his job. Moreover, he also had to understand the working of the education system. Gwalior not being an educational hub of Madhya Pradesh, Raj still saw a lot of opportunities to make his dream a reality. He planned his interactions with educational heads, faculty, and students. He left no stone unturned to understand the attributes of his target customer segment.

Acquiringan understanding of the working of the education system, in 2014, Raj decided to start with a crash course of 2 weeks and for this he hired space and a faculty. His dream of becoming an entrepreneur had begun to take shape, though he was unsure how things would progress. Initially he had 4-8 students which increased with every passing year. In the beginning, Raj had an apprehension, whether this setup would be unlike the earlier setups. But, the increasing number of students gave him confidence that he was on the right track. In 2017, his wife MayuriPadhiyar, an MBA Graduate from Mumbai joined hands with him in the business as the Co-Founder & Marketing head.

Digital Gurukul was now offering Diploma & Certification programs in 40+ Modules of Digital Marketing across Asia for students, business owners, and colleges. Some of the prominent modules were Social Media Marketing, Affiliate Marketing, Google analytics, Online guerilla marketing, Artificial Intelligence etc. It had also launched a new venture - Digital Gurukul Kids to provide Digital skill training to kids from grade (1-12). Besides this, many initiatives to offer Free Digital Training to most deserving students and small businesses across India were taken.

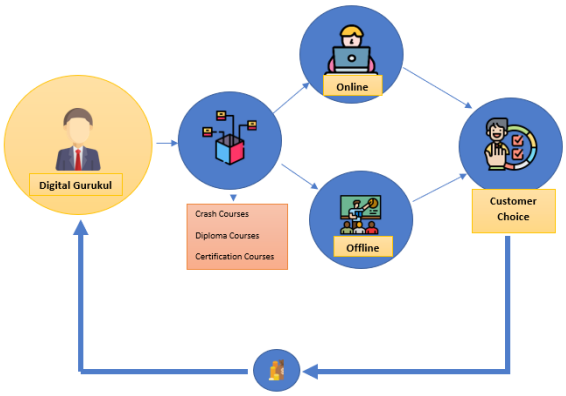
Looking over the business landscape, Raj saw both opportunities and challenges. He decided to introduce full-fledged digital and offline premium courses for the industry. Market had many similar players. They were offering courses with lesser emphasis on practical exposure. Recruiters prefer a skilled workforce for whom they have not to invest much on grooming. Realizing this need of the industry, Digital gurukul harnessed this need and ensured quality by giving practical exposures, hands-on-experience with proper assessments. Their AI-driven Career-Assist technology enabled them to match the skills of the students with career/entrepreneurship opportunities available. It connected learners to new opportunities, based on their individual skill sets, and career goals.

Entire placement team efforts and technology gave remarkable results. With passing years, there was a huge rise in the demand for digitally skilled individuals, therefore, they started offering Internship/Placement opportunities to the students who registered and completed various digital skill programs. This acted as a catalyst and helped them to keep their promises of placements and career transformations of their clients. The Company believed that Future being it was for them to care for millions of students, businesses by imparting those digital skills which could make them job ready and skilled enough to

launch their own dream startups for the future.

BUSINESS MODEL

Digital Gurukul worked on a hybrid business model, where they were offering premium courses to their clients on offline as well as online mode at the same time. In this model, clients were provided classes offline through trained instructors as well as they were provided with a learning management system facility, where they received online lecture series, practical assessments, performance cards, etc. The company offered one-on-one mentoring to its students and feedback to the parents. The business model was a premium hybrid business model in which communication was done from business-to-consumer (B2C).



HR CLIMATE

Digital Gurukul believed that a core member is someone who goes beyond his normal duties to achieve the organization's goal. The core team was built with the help of LinkedIn & Quora research on the criteria that the individual could perform the tasks that require a certain level of expertise. It was also important to have an attitude to learn and gel with the work oriented and people-oriented culture of the company. Digital Gurukul was a family guided by a set of values in order to achieve long-term objectives. For various job roles, their staff consisted of full-time, part-time, and freelancers. The company had a work environment wherein, employees had the belongingness to the organization and would not mind working beyond their normal duties. Employees were required to work in groups and therefore, team work was recognized and encouraged.

CHALLENGES AT THE OUTSET

Brands not only attract better talent but also lure consumers. Raj, a dogged committer, had the passion to make his organization a brand that would be recognized nationally and internationally. The well-known brands like Byju's, Upgrad, Dexler Education, Simplilearn, Edukart and Meritnation among others were already playing in the market and gave intense competition. Innovation was the only way to suffice. The key to the venture's launch and success was innovation. Once a learner had gained practical experience in digital skills, he was assigned with appropriate job roles. Students at Digital Gurukul had the option of selecting from a variety of job roles. The organization also began developing customized products for its customers, which included various colleges and universities. Another strategic move to meet the challenge posed by its competitors in the industry was to tap second-tier cities where the students do not have many opportunities and are eager to get a job. Most of their competitors lacked a strong presence in second and third-tier cities such as Ujjain and Ratlam. Supplementing the basic education of these students in order to increase their employability was another opportunity the organization harnessed. Word-of-mouth advertising was a strong tool in two-tier and three-tier cities, which helped the organization to attract the pool of students.

This was primarily done by alumni and satisfied students who had a job waiting for them after finishing their course. This resulted in Digital gurukul's success in these market segments.Digital Gurukul had trained

44850+ students across Asia & had won 20+ awards. But, Digital gurukul as a brand had to move a long way to become a global brand. Raj wanted to take his entrepreneurial journey to a global scale. To become a global brand the company needed huge financial and physical resources. Raj had made all of his investments from his savings because attracting investors for a small-scale industry was difficult for him. He required funding for his business to become global, for which he attempted to attract investors by offering franchisees to others and collaborating with various universities and colleges. However, obtaining huge sums from investors to fund large projects and market the products remained a major challenge for the organization.

Another challenge faced by the organization was retaining skilled employees. Greatest threat was from competitors, who hadthe strong financial muscle to offer higher pay packages to employees. Raj was attempting to overcome this challenge by instilling the values of loyalty and creating a conducive work environment to his employees. Respect, empathy, recognition, empowerment, trust was practiced in the organization and Raj was a role model for his employees. His employees were mostly former students. Raj evaluated these students' abilities and attitudes before offering them positions in his parent organization. However, this did not guarantee the long-term stay with the organization. Best of the employees were lured away by competitors many times. To move forward, stability of the team members was very important. The organization needed a stable team in order to create a positive work environment. Effective team building and conflict resolution was a concern of the organization, as the new team had to be formed every time when any team member would leave. The organization had 10-12 people who preferred to work as individuals rather than in a team.

Raj kept himself updated about the existing education system and its pros and cons and had started believing that digital is the new career field for the future. Indian parents prefer offline teaching as they think it is the best learning approach for their children. Changing the mindset of people was challenging task. Raj was quite optimistic that it is a time taking process which will definitely change with passing time and the market will definitely grow giving many opportunities. He was quite satisfied with the journey he had so far but his destination was too far. He was pondering whether future journeys would have similar opportunities and challenges and was it a right time to set his sights on foreign shores.

Questions for Discussion

1. Do you think Raj is a successful entrepreneur? Comment.
2. Discuss the factors accelerating the growth of the Digital Gurukul, with special reference to PESTLE Analysis.
3. Discuss the strategic interventions adopted by the organization. How far do you think these interventions have helped the organization?
4. If you are a consultant, what would you suggest to Raj for his offshore expansion?

Innovative HR Practices: Study Based On Selective Corporate Case-Lets

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ABSTRACT

The goal of this paper is to show how innovation has affected the HRM practices in the corporate world and the changes it has brought in the functioning of the organisation.

Approach: To accomplish our objective, we examined various research papers and case studies. We selected the ones that were pertinent and highlighted the passages that supported our study in the paper. In this research study, we've included a few case studies that have improved our comprehension of the innovations that have changed how human resources management is done and have aided in the expansion of the organization. We have examined the case-lets after their inclusion and drawn the appropriate conclusions. The study is entirely theoretical in nature and employs a qualitative approach to theory.

KEYWORDS

Human Resource, Innovation, Human Resource Practices, Corporate

INTRODUCTION

Effective human resource management cannot be satisfied with following a set of standardised procedures in an era of increased competition. To remain competitive, it is necessary to constantly develop and implement new and improved HR practices. The establishment of HR as a department within corporations was prompted by economic expansion and industrial change. When HR first gained popularity in the 20th century, it had the dual

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goals of resolving organisational issues and creating value by effectively managing and maximising the employee relationship. The effects of the industrial revolution prompted changes in HR, the development of corporations and organisational structures, and organisational struggles to boost productivity and lower employee turnover. During the first decade of the 20th century, the manufacturing economy saw organisational growth and technological progress, but there was no parallel advancement in general and human resource management practices.

HR innovation is the application of new proposals, processes, and technologies to better match up to the firm and its manpower's dynamic needs. It is about being aware of the forthcoming requirements and set of conditions rather than simply acknowledging the changes in the present scenario. Human Resources is an important aspect of any innovative organisation. According to psychology, every human being has the ability to solve complex problems and engage in creative behaviour. The role of key individuals who must always be on the move is another important factor in creating an innovative organisation. The HR function has come under pressure to lower costs, upgrade services, expand impact, and give its own employees a more fulfilling work environment—all while the tried-and-true methods of personnel management are insufficient to handle the new challenges facing human resources.

As corporations changed their business models and reinvented themselves to address the challenges posed by the competitive environment, HR services were also evolving to support the shifting business. This was revealed through his study of 130 large organisations. Given the strong and growing emphasis on innovation, organisations' human resource management programmes need to evaluate the talents of their staff members. According to Mesko et al. (2018), 50% of all employment will be obsolete within the next 20 years. In order to advance more quickly, modify practices and routines, and support organisational learning, HRM must overcome these crucial obstacles. Innovative HR practices promote organisational creativity. Building goal- and objective-based systems with rewards for successfully implementing and executing innovation is essential for supporting employees' careers and fostering innovation.

The future of work and employment must therefore take innovation into account. The HRM's endorsement of these changes should also be heavily considered. The HRM's role in facilitating these changes should also include carefully examining rules, acquiring new skills, and empowering teams to function in workplaces that are very different from the ones they were used to. For innovation to occur, businesses may use human capital to build organisational expertise for creating new products and services. There are no boundaries to human resource development and management innovation. These areas can be classified into three types. HRM can be analysed into three types: The first category of human resource management for innovation includes all of the parts of continual searching for the needed people, for the appropriate person, the position of searching for the right person for the right position or job. This task is challenging but can and should always be done with proper planning, recruiting, education, and training.

This comprises recruiting, teaching, and training highly competent managerial and leadership individuals for strategic and operational positions. These are the people who have the knowledge and abilities needed to lead and manage big and complex enterprises across all sectors. Second, technology innovation

is vital to strategic human resource development and capacity building, but it can only occur if the required financial resources are available to finance and support it. Without the requisite financial support, innovations can and do emerge, but they may not reach the developmental stage. The third category, strategic human resource development and management innovations is intimately tied to the previous two and complements them all. Underlying such assertions is the notion that HR professionals participate in the whole innovation process.

First, since it is considered that a company's potential to innovate is derived from its workforce's intellect, creativity, and imagination (Gupta & Singhal, 1993). Second, since the conception and implementation of innovations rely on their participation and support. In light of this, it is necessary to have a set of HRM policies that "can identify, create, assess, and reward the work behaviour that is compatible with the firm's innovation goals". Innovation in HR may be viewed as both a process and a result. This is why human resource management is crucial right now. Businesses should consider how investment in innovation will pay off in the future. HR executives must comprehend the value of innovation in today's industry. By innovating, businesses may set themselves apart from the competition and consider innovation to be a component of their new HR function. Although it may appear that organizational procedures are being changed somewhat at first, this will ultimately assist in simplifying processes.

REVIEW OF LITERATURE

The HR function has been burdened with the reduction of cost, enhancement of services, increment of impact, and in providing its own employees with more fulfilling work environments. All while the traditional approaches to people management are inadequate to address the fresh difficulties that human resources face. These tactics were the most effective in increasing employee attachment to the firm, according to Agarwala (2003), because they explained the most variation in organizational commitment among all other factors. Some researchers have reported that firms changed their strategies to face the aggression issues the firms were encountering; Additionally, HR services were evolving to accommodate the new organization. Human resource management programs for firms need to assess the talents of their staff members, given their robust and expanding emphasis on creative thinking. The next 20 years will see a 50% increase in obsolete employment.

A thorough and individualised course of study, a creative and open company culture, opportunities for professional growth, and a framework for evaluation that is focused on improvement were all found to be positively associated with organizational commitment amongst 370 software experts working for Indian organizations. Positive relationships between competitive edge over time, strategic HRM, and corporate learning were discovered by the researchers who looked into a variety of HR procedures used by Indian-based businesses, including pay, staff input, information exchange, description of duties, company polls, performance assessment processes, recruitment, instruction, and professional development. The findings showed that, along with turnover and productivity, Human Resource practice indices substantially and positively impacted all three dimensions of company success. Career planning has the greatest effect on attrition of any HR activity.

OBJECTIVE

The prime intention of the paper is to assess innovative HR practices, how HRM is being affected by innovation, and some unique HR practices adopted by renowned corporate houses to boost the internal environment.

INNOVATIVE HR PRACTICES IN CORPORATES

The MNCs' worldwide workforce administration (also known as HR tactics are still a hot topic of debate. It is still unclear, despite several studies, whether the transfer of employee relations procedures from parental to sister company should occur. The role that human resources teams play in the planned management of the organization is another intriguing issue that has developed, even if there are still doubts about the specific human resources methods and study methodology used in the aforementioned research. Whether or whether human resources departments play a crucial role in organizational strategy depends on how much input they provide. Technology innovation in the face of competition is one instance of the organization's strategic business emphasis. For all firms operating in a global market, a focus on innovation is essential given the desire to understand the role of technology. This study is particularly interested in how HR departments support technological innovation.

The importance of strategic HR practices in Indian firms has been extensively studied (Agarwala, 2003; Bhatnagar & Sandhu, 2005; Bhatnagar, 2007). The favorable correlation between "innovation" HR practices, business success, and organizational commitment has received a lot of attention in this research. Although this study has considerable theoretical and practical implications, little is known about the innovative human resources practices (IHRPs) used by high-tech companies in India for exceptions, see Agrawal (1999); Agrawal and Thite (2003). This information is significant since high-tech companies are essential to India's economic and social development. By looking at the IHRPs utilized by Indian advanced technology companies, the present research fills a gap in published research. We use the term HRMI, suggested by Wolfe (1995) and Wolfe, Wright, and Smart (2006), for innovations in HRM.

According to Wolfe (1995), an HRMI is a new concept, course, procedure, or methodology for the adopting company pertinent to the Human Resource Management function. Wolfe (1995) suggests that the adopting organization's involvement in promoting HRMIs. According to Wolfe (1995), HRMIs should be supported and the more radically inventive they are, the more significant the impact of change. According to Agarwala (2003), these strategies were the most successful in boosting employee attachment to the company because they explained the most variance in organizational commitment among all other characteristics. A positive relationship has been found between organisational commitment and HR practices, such as an innovative and open work environment, opportunities for career advancement, a development-oriented appraisal system, and comprehensive and personalised training programmes.

Significant human resource responsibilities and organizational learning capacity were found by Bhatnagar and Sandhu (2005) to be important determinants of business success and to be positively correlated with one another. For both Indian and foreign-owned firms, beneficial relationships between organizational learning and strategic HRM and sustained competitive advantage have been

identified. A variety of HR procedures used by Indian-based businesses, including remuneration, employee involvement, sharing of information, job descriptions, organisational surveys, performance evaluation systems, hiring, learning, and professional development have also been studied. The findings have shown that HR practice indices significantly and favourably influenced all three company performance measures, including turnover and productivity. Career planning accounted for the largest difference in turnover of all HR activities.

SELECTIVE CASELETS

1. **Microsoft India's HR Approach**

   Most corporations that have established operations in India have found managing human resources in the IT sector difficult. These businesses sought to profit from India's comparatively low cost of technically skilled labour compared to the US and established European nations. There was a significant need for competent workers in this industry, but businesses struggled to find enough of them to match the demand. Despite widespread praise for its HR procedures, Microsoft India's overall employee satisfaction was lower than the Indian industry average, according to Dataquest's "Best Employer Survey 2008."

2. **Innovative HR Practices at Wipro Technologies:**

   Every four months, Wipro Technologies conducts an employee survey in which all workers are asked for their opinions on the state of the workplace. This survey allows Wipro Technologies to learn how employees feel about the company and how strongly they understand their role within it. A person's capacity to connect with the organization's vision and knowledge of the extent of employee input into management are both important. Employees also report whether their manager is interested in their professional growth and whether they have ever gotten recognition from the boss for a job well done. The management sees things now after reading this.

   The HR review is a part of the planning cycle and involves everyone from the top of the business down. The process of succession planning for individuals involves identifying the top 10 talents and the lowest ten, who are allowed to step up and improve their performance or risk being dismissed. Every three months, they conduct this activity, which gives the public a chance to learn more about people as a resource. Azim Premji, CEO of Wipro Technologies, spends 3 to 4 hours educating each new set of workers about the company's commitments, values, and principles. They offer a program called "wings within, "allowing internal workers to apply for positions in other departments. They are not required to let their managers know. If they are chosen, they can go without anybody being able to stop them. Employees believe they are not being forced into a particular position.

3. **HR Practices at Google**

   The HR division in Google was lagging behind in the field of employing people and selection because of the company's rapid evolution. It also stated that in order to meet consumer demand, they would need to adjust their hiring methods and placement timeframe. In actuality, the company's human resource rules and processes were contradictory towards productivity and efficiency, which may have an adverse effect on the company's development and expansion. Google should make a quick physical, emotional, and spiritual connection with the person. This is only possible if they "live the talk," which means giving the brand a personal touch and demonstrating that they adhere to this philosophy. Additionally, enforcing team-based functioning reinforced the fact that interpersonal skills are the cornerstone of successful teams.

It also assessed whether Google's benefits were only an expense or a useful pull function. They must offer the highest salaries possible in addition to a long list of benefits, including work-life balance, in order to retain the best employees and in return, receive a respectable return on their investment, which they have rightfully reaped. All of this is taken seriously by Google. Google was able to manage their college environment along with rapid expansion and started to have greater success than its competitors because of their adaptability and foresight. They now work in a setting that supports and encourages successful careers. The low attrition rate of the group demonstrates this. When everything is considered, from hiring an employee to the perks and Google's exciting work environment, employees are drawn to work for one of the top "ten organisations." It is expected that management students and business owners will model and learn from the company's experience, making their businesses smarter and customer-focused in order to imitate the fundamentals of Google successfully.

4. **HR Practices at Taj Hotel**

The excellent hiring practices, carefully thought-out training plans, and preference for practical application over academic understanding are all evident in the HR policies of the Taj Hotel. Since its foundation, it has always embraced an employee-centric culture that aims to foster organizational citizenship behaviour (OCB) in its staff. As a result, the staff takes the utmost precautions to ensure the safety of its visitors.

Global IT and R&D consulting firm MindTree is an expert in outsourcing, product engineering, and offshore software development. MindTree, a 1999 incorporation, places a strong emphasis on its employees and a customer-first strategy. High success orientation and high compassion are priorities in the workplace. Through rigorous training and certifications, the organization supports competency growth. It stresses continual learning to achieve defined results for both people and the company while recognizing the accomplishments and efforts of employees. Additionally, MindTree provides training courses that aid staff members in honing their communication and judgment abilities.

With two-way communication offered by MindTree, managers and employees are encouraged to connect freely. The business also recognizes and rewards exceptional achievement and healthy competition. MindTree's international IT and R&D consulting firm focuses on outsourcing, product engineering, and offshore software development. In order to aid new recruit orientation, it also provides a mentor and buddy system. MindTree offers a variety of non-financial incentives to promote creativity, such as the company-wide Healthy Mind in Healthy Body campaign, which enables staff to fit exercise into their daily routines.

There are also athletic competitions and events, a variety of hobby classes, and educational programs, including yoga, salsa, and aerobics lessons. An on-site clinic, a full-time nurse, and twice-weekly on-site doctor visits make this possible. Additionally, interactive seminars with cardiology, ergonomics, nutrition, and lifestyle specialists are offered to bring staff members up to date on health- and energy-boosting trends and practices. Programs like "circle of life" are available to include and inform family members of employees about activities happening at MindTree. Employees can manage their personal and professional demands thanks to this work-life balance.

5. **Sasken**

For the Indian telecom business, Sasken provides network equipment (wireless and wireless),

semiconductors, wireless terminal devices, and test and measurement tools. Sasken was founded in that year. Sasken believes in employee independence and empowerment, and around 32% of new hires come from within the company through the company's internal referral program. Sasken encourages a performance-oriented work environment by using elaborate measuring systems and incentive programs to recognize and reward success. Performance determines incentives, possibilities for advancement, and rewards. The promotion of equity ensures that each employee has access to the same workplace, perks, and travel reimbursements.

Sasken depends on mentor-led, need-based training. The company supports continuous learning and employee growth and encourages workers to continue their education while they are employed. Senior executives of the corporation participate in courses at Harvard, the London Business School, and other prestigious international business schools. The company also funds higher education initiatives. To encourage leading a balanced lifestyle, the organization has implemented creative flex-time initiatives. The offices have cafeterias, a premium ATM, a gym, a medical facility, a day-care centre, and a travel desk.

6. **Philips**

Philips has been in business for 75 years and currently employs over 128,000 people. It bases its culture on simplicity and common sense. Mumbai serves as the primary headquarters for Philips in India. The Indian subsidiary employs about 11 people who are of foreign descent. The 11 people listed here hold senior-level jobs. About 40 people work for the HR department, also known as the HRM department. The HRM department's responsibilities include collaborating with business, advancing HR solutions, and involving people in change and innovation. The parent company manages global HR initiatives such as international hiring, stock options as remuneration, talent management, employee engagement, branding, and code of conduct. Local authorities manage hiring, pay and benefits, rewards and recognitions, sabbaticals, and community improvement. Globally and locally, training, development, and appraisal are controlled.

Philips India actively works on an annual HR strategy in the area of HR innovation. There are clearly stated key objectives for the year that match the broad company plans. The objective is to integrate HR and business operations while also being cost-effective, offering sustainable HR solutions. Philips India monitors customer quality and service standards in the spirit of continuous development in order to give outstanding and affordable HR services. The company is also aware of how to handle change brought on by ongoing advancements. HR chiefs took part in the organization's business strategy in addition to developing their own business plan for HR.

OBSERVATIONS AND CONCLUSION

Human Resource is a major asset for any organization. A holistic management approach that aids in an organization's success and goal-achieving is human resource management. Performance and the degree to which high-involvement HRM practises are adopted within an organisation is positively and somewhat statistically correlated. A range of strategies are available in human resource management to increase employee performance, enhancing an organization's overall success. Modern HR practises must now be used by all businesses. This is essential, especially when attracting new talent and rewarding current employees, two of the largest challenges organisations must face today. Virtual media has become more well-liked by businesses due to the use of social

media, especially if it helps them retain talent. The only way for businesses to succeed in today's fiercely competitive market is to utilise every worker's potential to the utmost degree. Unfortunately, a lot of companies still don't understand how important human capital is to running effective operations. This research will focus on modern HRM techniques that are successfully used by businesses today.

LIMITATION

The study is entirely theoretical in nature and employs a qualitative approach to theory.

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Employee Training and Development

by *Raymond A. Noe*

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Reviewed by Sumit Prasad* & Udit Kumar Pandey**

SUMMARY OF CONTENT

"Employee Training and Development" by Raymond A. Noe, Fifth Edition, is a comprehensive guide that covers various aspects of employee development to foster organizational success. The book commences with a persuasive argument for the importance of investing in employee growth and skills, setting the stage for the subsequent chapters. It delves into the training and development process, starting with the critical phase of needs assessment, followed by program design, and culminating in the implementation of effective training methods. Noe explores various training techniques and provides insights into employee motivation, ensuring a well-rounded approach to enhancing workplace skills.

The book also delves into evaluating training effectiveness, equipping readers with tools to assess the impact of training initiatives. It addresses career development and succession planning, offering valuable insights into fostering long-term growth and stability within organizations. Throughout the book, Noe seamlessly combines theoretical frameworks with practical examples, making the content accessible and relevant for both academic study and real-world application.

KEY STRENGTHS

"Employee Training and Development" boasts several strengths that make it an exceptional resource. One of its most prominent features is the seamless integration of theory and practice. Noe provides readers with a deep understanding of learning theories while simultaneously offering actionable strategies to design and implement effective training programs. This balance ensures that readers gain both theoretical knowledge and practical skills.

Seamless Integration of Theory and Practice: One of the book's standout strengths is its ability to seamlessly blend theoretical concepts with practical applications. Noe not only presents various learning theories and models but also provides actionable strategies and step-by-step guidelines for implementing effective training programs. This integration allows readers to gain a deep understanding of the principles while simultaneously learning how to apply them in real-world scenarios.

Well-Organized Structure: The book follows a clear and logical organization, guiding readers through each stage of the training and development process in

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a systematic manner. Starting with needs assessment and program design, it progresses through various training techniques, employee motivation, evaluation methods, and finally, career development and succession planning. This well-structured approach ensures that readers can easily follow and retain the content.

Engaging and Accessible Writing Style: Noe's writing style is clear, concise, and reader-friendly. Complex concepts are broken down into easily digestible pieces, making the material approachable even for those new to the subject. The use of real-world case studies and examples enhances engagement and reinforces understanding.

Incorporation of Visual Aids: The book employs charts, graphs, and visuals to complement the text, further enhancing comprehension. These visual aids provide readers with a visual representation of concepts, making it easier to grasp complex information and relationships.

Up-to-Date Content: The Fifth Edition ensures that the content remains relevant and reflects the latest trends and best practices in employee training and development. By staying current with the evolving dynamics of the workplace, the book maintains its utility in a rapidly changing business environment.

Applicability to Diverse Organizational Contexts: "Employee Training and Development" caters to the needs of both small and large organizations. Noe acknowledges that training resources and budgets may vary and provides practical solutions that accommodate diverse circumstances. This inclusivity broadens the book's appeal and utility.

Balanced Approach: The book strikes a well-balanced approach that appeals to both academia and practical application. It offers in-depth theoretical knowledge while ensuring that readers can apply the concepts effectively in real-life scenarios. This balance makes the book useful for both HR professionals and business students seeking to deepen their understanding.

ASSESSMENT

"Employee Training and Development" is an exceptional resource that delivers on its promises. Noe's expertise shines through in the balanced and practical approach to the subject matter. The book's content is valuable to HR managers, training specialists, and business students seeking to build a well-trained and dynamic workforce. The inclusion of actionable strategies and real-life case studies enhances its applicability to a wide range of scenarios.

Comprehensive Coverage: The book provides a comprehensive overview of employee training and development, covering a wide range of topics, from needs assessment and program design to training methods, employee motivation, and evaluation techniques. The inclusion of career development and succession planning further adds to the book's completeness, ensuring that readers gain a holistic understanding of the subject.

Practical Relevance: Noe's emphasis on practical application sets this book apart. By offering actionable strategies and step-by-step guidelines, readers can readily apply the concepts to real-world scenarios. This practical approach makes the book a valuable resource for HR managers and training specialists seeking to design and implement effective training programs.

Evaluation Tools: The book dedicates a significant portion to evaluating training effectiveness. Noe equips readers with various evaluation methods, allowing organizations to measure the impact of their training initiatives accurately. This emphasis on evaluation ensures that organizations can continuously improve their training efforts and optimize employee development.

Inclusion of Real-World Case Studies: Throughout the book, Noe supplements theoretical concepts with real-world case studies and examples. These case studies offer practical insights into how different organizations have tackled training and development challenges, making the content relatable and relevant to readers from diverse industries.

Academic Rigor: While the book caters to practical applications, it also maintains academic rigor. Noe presents the latest learning theories and models, ensuring that readers grasp the underlying principles and mechanisms of employee training and development. This balance makes the book suitable for both academic study and professional practice.

Accessible Language: Noe's writing style is clear and accessible, making the content understandable to readers with varying levels of expertise in the field. Complex concepts are explained in a straightforward manner, without compromising on the depth of information provided.

Data-Driven Approach: The book relies on current research and data to support its arguments and recommendations. Noe draws on evidence-based practices, ensuring that readers receive up-to-date and reliable information. This data-driven approach enhances the book's credibility and trustworthiness.

Addressing Diverse Organizational Needs: "Employee Training and Development" acknowledges that training requirements can vary among organizations. Noe offers practical solutions that cater to both small and large organizations, considering different budgets and resources. This inclusivity makes the book adaptable and valuable to a wide range of readers.

CONCLUSION

"Employee Training and Development" by Raymond A. Noe, Fifth Edition, stands as an authoritative and invaluable resource for anyone involved in human resource management, training, and organizational development. This book's numerous strengths make it a standout guide that offers both depth of knowledge and practical application, setting it apart from other resources in the field.

With a comprehensive and well-organized structure, the book takes readers on a journey through the entire employee training and development process. Noe's seamless integration of theory and practice ensures that readers gain a deep understanding of learning theories and models while simultaneously acquiring actionable strategies to design and implement effective training programs. The inclusion of real-world case studies and examples further enhances the book's relevance and applicability, offering valuable insights into how different organizations have tackled training challenges.

One of the book's notable features is its emphasis on evaluation. By equipping readers with various evaluation methods, Noe empowers organizations to assess the impact of their training initiatives accurately. This data-driven approach enhances the credibility of the book and encourages organizations to continuously improve their training efforts.

Moreover, Noe's accessible writing style and use of visual aids make complex concepts easy to understand and retain. Whether one is an experienced HR professional or a student starting their journey in human resource management, the book caters to readers with varying levels of expertise.

The Fifth Edition's dedication to staying current with the latest trends and best practices ensures that the content remains relevant in today's dynamic business environment. Noe's consideration of diverse organizational needs, from small businesses to large corporations, makes the book adaptable and valuable to a wide range of readers.

In essence, “Employee Training and Development” is more than just a textbook; it is a practical guide that equips readers with the knowledge and tools to build a skilled, motivated, and successful workforce. Noe’s commitment to bridging the gap between theory and practice makes the book a go-to resource for HR managers, training specialists, and business students seeking to optimize employee development and drive organizational success.

Overall, “Employee Training and Development” is a compelling and indispensable addition to the libraries of professionals and students alike. Its comprehensive coverage, practical relevance, and balanced approach make it a beacon of excellence in the field of employee development, making it a highly recommended read for anyone seeking to create and sustain a thriving organizational culture through effective training and development initiatives.

Indian Journal of Training & Development (IJTD)

Call for Papers for Forthcoming Issues

Indian Journal Training and Development is a quarterly journal of Indian Society for Training and Development. It caters to the needs of academics, corporate professionals and practitioners in the field of learning and development.It invites original contributions for its forthcoming issues.

General Issue: Contributions of the following type related to learning and development.

The contributions can be made to any of the following categories:

(1) **Research paper:** Conceptual, analytical or empirical research papers using qualitative or quantitative methodology are invited from researchers, academics and corporate professionals. The empirical papers should include literature review, rationale, appropriate research methodology, rigorous analysis, and conclusion.
The submission should be in APA style (between 4000-5000 words)

(2) **Practitioner's perspective:** Perspective articles based on unique or rich experience, or innovative L & D practice or experiential learning, artificial intelligence, or emerging technologies. (between 4000-5000 words)

(3) **Cases or case study of an organisation** (between 2500-3000 words) with approval of the organisation

(4) **Book Reviews :** The review of a recently published bookrelating to learning and development /human resource management.

The diagrams, images or picture above should be in high resolution and with the image source. Graphs and tables should be in MS word format (on a separate sheet) and marked for insertion at the appropriate place in the text. All the submissions should be sent to chiefeditor@istd.in, and ijtd@istd.in.

Please submit your contributions on the above IDs Only.

Prof (Dr.) Upinder Dhar
Chief Editor
Indian Journal of Training & Development

Indian Society For Training & Development

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TRAINING CALENDAR FOR THE YEAR 2023-24

S. No.	Program Name	Duration	Dates
1	POSH Certified Trainer's Program	Three Days	01 - 03 Feb 2023
2	Certified Train the Trainer Program	Four Days	21 - 24 Feb 2023
3	International Conference on Human Capital Development for Energy Transition (ISTD Knowledge Partner)	Two Days	27-28 Feb 2023
4	International Conference on "Gender Equal Nation Building"	Two Days	10 - 11 Mar 2023
5	ISTD Foundation Day	One Day	10 April 2023
6	NLP Practitioners' Workshop	Four Days	26-29 April 2023
7	Youth Festival	Two Days	25-26 May 2023
8	POSH Certified Trainer's Program	Three Days	31st May-2nd June 2023
9	Certified Train the Trainer Program	Four Days	26-29th July 2023
10	Personal Branding	One day	28th July 2023
11	32nd Innovative Training Practices Award 2021-22 Program	One Day	3rd August 2023
12	Gender Equal National Building – Ahmedabad Chapter	One Day	25th August 2023
13	Youth Conference 2023 - 'Empowering Youth for Nation Building and for Leading Sustainability'	One Day	1st September 2023
14	Eastern Regional Conference	Two Days	15-16 September 2023
15	HR Analytics for Enhanced Performance	Four Days	September 2023
16	Spirituality - Lessons from Ramcharitmanas & Bhagwadgita	Two Days	September 2023
17	Gender Equal National Building- Chennai Chapter	One Day	Oct/Nov 2023
18	Mental Health Day	One day	10th October 2023
19	Leadership Development Program	Three Days	October 2023
20	Internationally Certified Trainer Program	Five Days	October 2023
21	POSH Certified Trainer's Program	Three Days	November 2023
23	Intellectual Workshop Property Rights (Offline) Program	Two Days	December 2023
24	National Convention 2023	Two Days	December 2023
25	Gender Equal National Building – Kota Chapter	One Day	January 2024
26	Gender Equal National Building - East	One Day	March 2024
27	33rd Innovative Training Practices Award 2022-23	One Day	19th March 2024
28	2nd International Conference –"Vasudhaiva Kutumbakam"	Two Days	21-22 March 2024

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