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** New Series*

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Contents

Articles

EVALUATION OF JOB SATISFACTION OF HEALTHCARE PROFESSIONALS WORKING IN PUBLIC HOSPITALS IN THE KATHMANDU VALLEY

Kapil Khanal*

ABSTRACT

This study tries to find out the factors that influence job satisfaction of hospital employees working in governmental hospitals in the Kathmandu valley. Descriptive and exploratory research designs were carried out among professionals with varying specializations, by asking them to respond the questionnaires largely based upon the JSS questionnaires developed by Paul E. Spector (1997) using the 5-point Likert scale. Convenience sampling method was employed in this study. Demographic variables like age, rank, and educational qualifications have a significant relationship with job satisfaction while gender, marital status and work experience didn't show any significant correlation with job satisfaction. The study provides an insight into the various factors that need to be considered for uplifting the job satisfaction levels of healthcare professionals, to policy makers, hereby uplifting the standard of the health- care system in governmental hospital.

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1. INTRODUCTION

The extent to which an employee feels self-motivated, content and satisfied with their job is known as job satisfaction. When employees feel like they have job stability, career growth, and a comfortable work- life balance, it is understood that the employee has job satisfaction. In the area of organizational performance and human resource management, job satisfaction is a largely sought out subject. If employees feel happy with their company work, they look to give back to the company in the form of extensive efforts on the work front. Managers should focus on employee satisfaction because dissatisfied employees may get irritated and end up providing inferior services. Essentially, job satisfaction is an indication of good treatment and emotional well-being to some extent.

People around the globe demand Universal Health Coverage (UHC) of good quality to ensure access to healthcare services for disease prevention and cure, palliation, health promotion, and rehabilitation, as and when needed, without causing a financial burden (WHO, 2017). The dream of UHC can turn into a reality through a well-functioning healthcare system equipped with a skilled workforce, as users of the healthcare system today are more aware of their rights- have higher expectations from their healthcare providers and demand improving standards of care, as they know that their satisfaction is the key to judging the quality of health services. This is why- health institutions of today lay more emphasis than ever, on having an upgraded, well abreast with knowledge and skilled workforce which is satisfied with their job (Janicijevic et al., 2013). These healthcare service providers are an integral block of an efficient and effective healthcare system, and their worldwide shortage is an impediment to the achievement of Millennium Development Goals, more so in low and middle-income countries. According to the World Health Organization by the year 2035, the healthcare workforce shortage will reach up to 12.9 million (WHO, 2013).

Workplace stress can lead to poor health and work-related injuries (Iglehert, 2000). Health care professionals comprise an important group that can be impacted by workplace stress because of their unique work environment (Grunfeld, et al., 2005). The Nepalese governmental health sector is relatively less well organized. The workers within the governmental sector face numerous issues that grossly affect the level of job satisfaction. Job satisfaction in workers is imperative, stimulating productivity as well as quality of work (Van et al., 2008). Among health care workers, job satisfaction has a great impact on work quality

and efficiency, including health care costs (Bovier & Perneger, 2003). Studies showed that job satisfaction among health care workers is influenced by many factors, including sex, age, level of education, work experience, working conditions, salary, working hours, and the possibility of promotion (Fahrenkopf et al., 2008).

Job satisfaction in workers is a very important factor that influences productivity, as well as the quality of work within an organization. This intricate phenomenon is an attitude towards one's job that has an impact not only on the personnel's motivation, but also on their career, health and relationships with co-workers (Visser et al., 2003; Bresic et al., 2007). Moreover, low salaries, lack of fringe benefits, job insecurity, nepotism, political influences and an improper career development structure are some of the important factors that either hinder qualified healthcare professionals from joining the governmental sector or increase the turnover rate (Makowiec-Dabrowska et al., 2008; Price, 2001).

The World Health Organization (WHO) defines the health workforce as “all people engaged in actions whose primary intent is to enhance health” (WHO SEARO, 2008). Human resources pertaining to healthcare can be defined as the various kinds of medical and para-medical staff responsible for individual and public health intervention. This includes both public and private sectors and different areas of health systems, such as curative, preventive care, personal and non-personal public health interventions, disease prevention, health promotion services, research, management and support services. Human Resources for Health (HRH) are among the very important building blocks of the health care system. Healthcare resources include different categories of healthcare professionals ranging from doctors, nurses, paramedics, and mid-level healthcare professionals from different specialties of health sciences, to public healthcare professionals and researchers. Community and volunteers are also very important human resources in this space. Human resources for healthcare and their proper utilization in the health work environment is a pre-requisite for better functioning of the health care system (WHO SEARO, 2008).

In Nepal, the HRH situation has been facing several challenges, particularly related to the shortage and uneven distribution of the healthcare workforce in the country (MOHP, 2012). Despite the need for an appropriate number and distribution of different categories or levels of healthcare personnel, who are socially responsible, technically competent and are available at the right time and place, as outlined in the National Health Policy 1991, these challenges have prevented policy from being translated into practice. Moreover, the National Health Policy has not taken into consideration the epidemiological transitions and demographic developments that have occurred over the last two decades. Although South-

East Asia is one of the endemic zones to approximately 25 percent of the world's population with almost 30 percent of the global disease burden, it has only 10 percent of the global healthcare workforce (WHO report).

Nepal has been identified by the World Health Organization as one of 57 nations with a critical shortage of healthcare professionals (WHO report). . This creates a huge deficit in the requirements for the coverage of essential interventions; including those necessary to meet the health related Millennium Development Goals (MDGs). In Nepal, this is unlikely to happen until the threshold density of (doctors, nurses and midwives) is at least 23 per 10,000 in the population (NHSP II, MOHP 2010). Furthermore, policy has not addressed the changing demographics in the country, as despite a population increase of more than 45 percent in the last two decades the human health resources have increased by only 3.4 percent during that time (NHSP II, MOHP 2010). This distribution has raised a concern in Nepal, with huge variations between ecological zones, and among the 7 federal states of the country. The absence of doctors and qualified healthcare professionals in the most remote areas has also been a long standing issue. These issues are compounded by the movement of high-level health workers, such as doctors, nurses and professionals of other specialties to private health institutions or overseas, due to the high demand for health workers in industrialized countries, as well as attractive incentives that they offer.

The most recent draft of the Human Resources for Health Strategic Plan 2011-2015 has identified major challenges related to HRH in the country (MOHP, 2010). These include imbalances in the mix of staff and skills, particularly in light of the changing burden of disease, changing healthcare technologies and increasing population and demand for quality curative services. National policies and plans have not been based on detailed evidence regarding the situation on ground (NHSP II, MOHP 2010). In Nepal, like in other developing countries- the 'brain drain' of health workers has been identified as a major concern. Previous research has identified that professional councils are often approached for letters of good standing by staff wanting to work abroad, and data suggests that approximately 16% of registered doctors are outside the country, studying or working (Blair, 2011)

Out of the 8,771 medical doctors in the nation, only 1,062 are working in sanctioned government posts, and about 300 are working in government posts under the Ministry's scholarship program (Dixit, 1998). Two-thirds of healthcare staffs members are working in either the Kathmandu valley or in other cities, leaving rural areas under-staffed, with absenteeism surfacing as a growing problem. In Nepal, health sector constitutes about one-fourth of the total personnel of the public sector. The existing data revealed that only 4% of

total health care providers are doctors, 12% are nurses, excluding ANMs, 47% are paramedics, 0.92% are public health officers and 3.1% are traditional health care providers. Still there exists a high number of unskilled support staff (28% of the total health care workers) (NHSP II, MOHP 2010). This poses a challenge to the healthcare system to reduce the volume of unskilled and semi-skilled staff as a percentage of the total health care workers.

The main issues in the human resources for health of Nepal are retention, inadequately skilled manpower with improper distribution, inadequate finance, and low opportunity for pre and in service training. Because these issues were recognized by the government of Nepal, they developed the Human Resource for Health Strategy in 2003, for 14 years, i.e. 2003-2017. However, this did not to be effective because of inadequate projection, poor implementation, inadequate funding, and a lack of ownership by the stakeholders. Therefore, a new initiative plan has been developed in 2010; a comprehensive HRH Strategic (2011-2015) to address the long standing problem of human resources in the health sector (Shrestha C, 2012). In addition, a notable feature in human resource for health development in Nepal is that the private sector has emerged as a substantial force in HRH, and can contribute service delivery in coordination with public sectors; however the coordination between these two sectors is very weak and the private sectors are more concerned about urban areas for greater profits. So, governmental health facilities should be strengthened and for those healthcare professionals working in public hospital need be prioritized and retained (Shrestha C, 2012).

Employee job satisfaction is considered as a critical success factor for organizations. A Number of researches on this topic have been conducted all around the world. In the past few decades, this issue has aroused interest in Nepal as well. Unfortunately, it has been observed that enough research has not been done in Nepal's major governmental healthcare institutions, related to job satisfaction. To the best of my knowledge, no published study covering major healthcare professionals of varying specializations has been found in our scenario. Non-profit public organizations are essential for the country and its economy. Therefore, the issue is important for public institutions.

In developing countries like Nepal, many healthcare workers are not satisfied with their salaries or job incentives, their quality of life, and the lifestyle they can offer their families, in their country. They believe that they lack opportunities to learn advanced technologies, have fewer opportunities for developing their skills and career, have poor working conditions, face

violence in the workplace, and are under political influence. These de-motivated employees, then search for jobs in developed countries which have a higher pull force.

For these reasons, one of the tertiary level governmental healthcare institutions has been selected for this study, to measure job satisfaction among healthcare professionals. The public institutions where this study has been performed are central government institutions, subject to central government budget applications and limitations. These institutions implement fundamental health policies and activities mainly related to health. Therefore, the job satisfaction is worth investigating, and it is very important that job satisfaction be kept at high levels in kinds of institutions. The intention of this study is to make recommendation to the government and public health institutions of the country to take necessary steps to keep employees satisfied with their work and other work-related factors, for the success of the institution.

1.1 Research Questions

i) What is the situation of the demographic profiles of healthcare professionals in government hospitals in the Kathmandu valley?

ii) What are the most important factors that determine job satisfaction among healthcare professionals in government hospitals in Kathmandu valley?

iii) What is the rank correlation among job satisfaction factors in healthcare professionals?

1.2 Objectives of the Study

This research is aimed to identify the level of job satisfaction among healthcare professionals in government hospitals in Kathmandu valley. To achieve the general objective, the specific objectives are as follows:

- To analyze the demographic profiles of healthcare professionals working in government hospitals in Kathmandu Valley.
- To identify the important factors affecting job satisfaction of healthcare professionals.
- To measure the rank correlation among job satisfaction factors in government hospitals in Kathmandu valley.

2. METHODOLOGY

Descriptive and explanatory research designs were used in this study. The employees of all government hospitals in Kathmandu valley represented the total available population for this

study. Among them, 602 employees were selected as a sample for the study. In this study, multi stage sampling and convenience sampling have been adopted. Multi stage sampling is carried out in two or more stages and where the population is scattered over a wider geographical area. The data has been collected from both, primary as well as secondary sources. In order to obtain the desired information regarding job satisfaction levels among healthcare workers, primary data was collected and analyzed. The secondary information has been collected from various publications relating to healthcare workers and the healthcare system. To ensure that the study remains meaningful, the data was analyzed and interpreted with the help of certain statistical tools and techniques. Descriptive data analysis tools such as frequency table, measures of central tendency, and measures of dispersion as well as inferential tools such as coefficient of correlation and regression equations have been used. The data for this research was analyzed using the Statistical Package for Social Science (SPSS-25 version).

3. RESULTS AND DISCUSSION

3.1 Demographic Profiles of Respondents

Table 1

Variables	Frequency	Percent
Gender		
Male	314	52.20
Female	288	47.80
Age in years		
Up to 30 years	158	26.2
31-40	334	55.5
41-50	100	16.6
51-60	10	1.70
Marital status		
Married	488	81.06
Unmarried	114	18.94

Academic qualification		
Up to Plus Two	116	19.30
Bachelor	274	45.50
Master and above	212	35.20
Experience in years		
Up to 1 year	56	9.30
1-5 206	34.20	
5-10 202	33.60	
Above 10	138	22.90

Source: Primary survey, 2022

Out of 602 respondents, there were 334 males (52.2%) and 288 females (47.8%). This shows that the majority of the participants were males. The participants were divided into four age groups: up to 30, 31 - 40, 41 - 50 and 51 - 60 years. We included the 60 years of age, considering that 60 years is the compulsory retirement age for healthcare professionals in Nepal, per the Heath Service Act of Nepal (2020). There were 79 (26.2%), 167 (55.5%), 50 (16.6%), and 5 (1.7%) respondents in the age groups 20 - 30, 31 - 40, 41- 50 and 51 - 60 years respectively.

In the study, the educational qualification of the respondents was as follows: 116 (19.3%) had completed up to the 'plus two' (higher secondary) level of study, 278 (45.5%) had completed the undergraduate level of study, and 212 (35.2%) had completed postgraduate or higher levels of study. This study consists of the participants with varying work experience in terms of duration. 9.30% participants had up to 1 year of work experience, 34.20% had 1 to 5 years of experience, 33.60% had 5 to 10 years of experience, and 22.90% had above 10 years of work experience.

3.2 Descriptive Analysis

Table 2
Job Satisfaction Scale (JSS)

Overall job satisfaction of the participants

	Frequency	Percentage
Very Dissatisfied	4	0.7%
Dissatisfied	62	10.4%
Neutral	366	60.8%
Satisfied	158	26.2%
Very Satisfied	12	1.9%

Source: Primary survey, 2022

After calculating the total facet score for each of the six aspects of job satisfaction, the total score was calculated on a scale of 30 - 150. The score values of 30 - 54 were considered as very dissatisfied, scores of 55 - 78 were considered dissatisfied, scores of 79 - 102 were considered neutral, 103 - 126 were considered satisfied and 127 - 150 were considered very satisfied. Observing these values, 0.7%, 10.4%, 60.7%, 26.2%, and 1.9% of the participants were very dissatisfied, dissatisfied, neutral, satisfied, and very satisfied respectively. Table-5 represents data regarding the overall job satisfaction of the participants.

Table 3

Job satisfaction in different sub-scales

Sub-scale	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Autonomy	0.7%	9.3%	56.8%	31.3%	1.9%
Work Environment	0.7%	6.9%	48.9%	39.6%	3.9%
Recognition	0.7%	2.6%	38.6%	56.8%	1.3%

Promotion	10.6%	26.6%	36.5%	26.3%	-
Supervision	3.3%	28.6%	47.1%	20.3%	0.7%
Pay and Benefits	11.7%	39.2%	45.2%	3.9%	-

Source: Primary survey, 2022

The overall job satisfaction was studied under six sub-scales - Autonomy, Recognition, Work Environment, Promotion, Supervision, and Pay and Benefits. On analyzing the satisfaction level on those sub-scales, recognition was found to hold the highest percentage of satisfaction (58.1%); followed by work environment (43.5%) and autonomy (33.2%).

When the job satisfaction of the healthcare professionals according to their area of specialization was analyzed taking into account the average total job satisfaction score, pharmacists were found to have the highest score (108.36). They were followed by chief consultant doctors (103.67), medical recorders (102), consultant doctors (100.71), physiotherapists(100.20), medical officers (98.50), biomedical technicians/engineers (90.45), health assistant (89.35), laboratory technologists (85.89), radiographers and nurses (82.65). Nurses were found to have the lowest score among all the specializations.

3.3 Inferential Analysis

Table 4

Correlation between overall job satisfaction and each sub-scale of satisfaction

Sub-scales	Spearman's correlation coefficient	p-value*
Autonomy	0.46	<0.001
Work Environment	0.65	<0.001
Recognition	0.75	<0.001
Supervision	0.79	<0.001
Promotion	0.67	<0.001
Pay and Benefits	0.72	<0.001

*statistical significance at 0.05

In order to determine the main factors that were correlated with satisfaction and/or dissatisfaction with a job, the relationship between overall job satisfaction and job characteristics was analyzed. Spearman's ratio demonstrated that the strongest correlation factor was in Supervision (0.79). Other factors that influenced satisfaction were Recognition (0.75) and Pay and Benefits (0.72), respectively.

The relationship between socio-demographic variables and job satisfaction score was quantified. Age, rank, and educational qualifications showed a statistically significant relationship with the overall job satisfaction ($p<0.05$). Gender, marital status, and work experience did not show any significant correlation with the overall job satisfaction ($p>0.05$).

DISCUSSION

The healthcare system of Nepal is struggling with various blocks due to the economic, political, and peace-related instability in the region, and one of those pivotal blocks is human resources for health. There is increased dissatisfaction in all walks of life, which has been observed in this developing country, and healthcare resources are no exception. This is something which cannot be overlooked as it will in the long run; not only worsen the gap between the desired and the actual number of health care workers but will also adversely affect their performance, efficiency, and effectiveness.

In an international pursuit to reduce global poverty and improve population health, the world's governments have committed; to achieve universal health coverage (UHC) including financial risk protection by 2030, in the Sustainable Development Goals (WHO, 2017). A critical decision in the progressive realization of UHC is, which health services to include in essential packages of care. To realize the goal of comprehensive universal health coverage, it is important to increase the utilization of public health services through effective care. As per the data provided by the National Health Account 2016, the household out of pocket expenditure in Nepal is 53%, one of the highest in the world (NHA, MOHP, 2016). The Government of Nepal has always prioritized the improved healthcare services in the country. The constitution of Nepal, 2015, has established health as the fundamental right of the people. But all these efforts cannot help achieve the desired goal, until the nation has self-motivated and efficient healthcare providers at primary, secondary, and tertiary healthcare levels. Their motivation is the key to effective healthcare service delivery, and their motivation depends on job satisfaction. So, it is critical to ensure that they feel satisfied with their jobs. This study included with different designations to gain a comprehensive picture of the job satisfaction scenario in the healthcare system in Nepal.

Past studies focused mainly on doctors and nurses (Jharana S, AB Hamal, Gayatri H, Mausam S, SS Budhathoki,2019; Chaulagai N, Khadka,2012; Peters DH, Chakraborty S, Mahapatra P, Steinhardt L, 2010). This study has included different healthcare professionals of varying specializations. The Job Satisfaction Survey (JSS): Spector (1997) yield an overall satisfaction score and 9 fact specific scores. The fact specific scales include pay, promotion, and supervision, fringe job satisfaction studies to describe the participants and to determine the relationships among the variables. Some positive relationships are identified and sometimes negative ones for the some variable. Our study has used JSS. This is a frequently used validated instrument that allows comparisons with previous studies (Sibbald et al., 2000).

Only 28.1 % of the study participants showed satisfaction with their jobs based on the absolute approach used for computing the job satisfaction scores ranging from 30-150. Low levels of job satisfaction were also reported in a job satisfaction study conducted Pakistan; where 14% of the employees showed high dissatisfaction with their jobs (Kumar et al., 2013). This has big implications for the public health system, which is already facing a shortage of financial resources and can't afford to lose its existing skilled workforce. Another study done in Lahore showed that only 31.1% of doctors were satisfied with their jobs (Deeba et al., 2015). In yet another study, it was observed that only 13% of the doctors were well contented with their jobs; while a substantial number had below average or average levels of satisfaction (Nikic et al., 2008).

This dissatisfied workforce may further get added to the pool of workers who leave their country or their city in search of better opportunities. It has been noted that despite being brought to the notice of the people and the policy makers, not much effort has been made in order to bring an improvement in the satisfaction levels of healthcare services employees, who are an integral part of the healthcare system, and without whom the delivery of healthcare services to the needy cannot be achieved. Any level of dissatisfaction among healthcare providers in the public sector demands further assessment, as this could have deterrent consequences in terms of overall efficiency, effectiveness, and sustainability of any healthcare system.

This study on job satisfaction was carried out in a government hospital in Kathmandu. This means, the results of this study should seriously concern the policy makers. Even though the study was conducted in the capital, which is presumed to have a relatively comfortable work environment, good infrastructure, and a general convenience, the results showed a very low satisfaction among professionals.

Job satisfaction was similar across all age groups in our study. Some studies have reported higher satisfaction in elderly professionals, compared to younger professionals (Carrillo-Garcia et al., 2013; Alcaraz et al., 2019). When analyzed with the gender, marital status, and the experience, the result showed no statistical significance in this study. This is contrary to the results from some previous studies (Shrestha C, 2012).

Male workers felt more satisfied compared to females similar to a survey conducted among German physicians (Behmann et al., 2012). However, a Spanish study (Carrilo et al, 2013) reported greater satisfaction among males than females, which is in line with our results. Some other reviews concluded that gender is not a strong independent predictor (Keeton et al., 2007; Cujec et al., 2000). These differences may be due to cultural variations. Professionals with higher ranks and higher educational qualifications showed higher job satisfaction levels, and this result was found to be statistically significant. This can be attributed to the fact that professionals in higher positions with higher qualifications enjoy greater respect and pay than the others; and they may also have a certain degree of influence on the management.

The three highest levels of satisfaction were Recognition, Work Environment and Autonomy. This agrees with the findings of Cooper *et al, 2000,* who reported that health-care providers appreciated their freedom and independence to work, and they also enjoyed the responsibility and variety of their job, with the recognition it brought them. Work autonomy is a feature which distinguishes healthcare and other service industries. If the workers feel they are handcuffed due to the work conditions and believe that the administrative procedures pose barriers in the performance of duties, then the quality of services offered also get adversely affected, as many treatment options or timely decisions cannot be taken due to these red tapes.

Our study revealed that the participants had an overall low level of satisfaction with only 3.9% satisfied with their remuneration, only 21% satisfied with the supervision, and 26.3% satisfied with their promotion chances. All these results regarding pay, promotion opportunities, benefits and rewards tally with the findings which were presented in the study reflecting job satisfaction in public health care workers in Pakistan (Kumar R et al, 2013). Low satisfaction with salaries and, development opportunities was also reported in a study done among healthcare workers in Tanzania (Nikic et al, 2008). Healthcare as an umbrella of professions, is different from other professions in the sense that here the biggest reward is the satisfaction of providing services to mankind alongside the appreciation it brings. But conversely, if the workers don't get their due reward, it quickly leads to dissatisfaction and

can negatively influence the quality of care which they provide. The results related to 'supervision' showed that most of the respondents were dissatisfied with the capabilities of their supervisor, and the role they play in mentoring them. This is particularly important with regards to the healthcare industry as the workers have to deal with patients, not machines, and learn skills to scale up their capabilities. If they believe that their supervisor lacks the ability to guide them and does not entrust them with tasks that can add to their skills, they will be at a loss.

Dissatisfaction with one's salary, in our findings, seems to be a common issue that is also evident in several other studies (Kinzl et al., 2004; Goetz et al., 2011; Burnard et al., 1999). Many managers consider that the key motivators for their employees are pay, bonuses, or raises. This suggests that healthcare systems should provide a suitable salary, and a fringe benefits scheme to satisfy their workers and retain their loyalty. In contrast, this does not seem to be a problem in Australia as evidenced by a previous study done in 2002. This discrepancy may be due to differences in the economic status of the Australian health-care systems and the Nepalese healthcare systems (Ulmer, Harris, 2002)

The main factors that correlated with overall job satisfaction were supervision, followed by recognition, and pay. Thus, the study suggests working on improving the quality of supervision, providing greater recognition for work well done and other contributions, and also increasing incentives. For improving the quality of supervision, policy makers must ensure the adequate training and education of the supervisors, in order to enhance their skills.

When asked about their preferences, more than 80% of the participants preferred working in governmental hospitals, with the major reason being job stability. Similarly, the study also asked for their suggestion for overall improvement in job satisfaction. Among the various suggestions, common ones were an increase in salary and benefits, creation of good and fair opportunities for training and education, and the introduction of a good performance appraisal system.

4. CONCLUSION AND IMPLICATIONS

The extent to which an employee feels self-motivated, content, and satisfied with their job is job satisfaction. This study was carried out to find out the factors that influence job satisfaction of hospital employees working in a tertiary level governmental hospital in Nepal. There are many reasons for healthcare organizations to improve job satisfaction levels; it

makes employees happier, it lowers the costs of hiring and training new personnel, and it also ensures that employees are more motivated and productive. At the same time, it cannot be denied that employees deserve to be treated with love and respect. The Constitution of Nepal – 2015, has established health as the fundamental right of the citizens. Various schemes developed by the government like the health insurance, schemes for cancer, head and spine injuries, trauma, HIV/AIDS, tuberculosis, free emergency services, safe motherhood, schemes for the poor and marginalized communities and senior citizens, among others have made healthcare free or very affordable for the citizens of Nepal. For the healthcare system to function effectively and remain sound, the satisfaction of healthcare professionals working in the governmental hospitals of the country is of much importance.

Job satisfaction influences an employee's daily motivation to go to the workplace, as well as their social relationships. An extremely demanding workplace can lead to feelings of uncertainty, low self - esteem, and concerns about future career goals. This study intends to sensitize the policy makers on the subject of satisfaction of the workforce and its implications in the governmental hospital of Nepal. It is essential to beef up the policies related to healthcare providers and their working conditions regularly. Interventions directed at improving these various facets will have a positive effect on job satisfaction. A conducive working ecosystem, in addition to a satisfied and ambitious workforce can have a positive impact on the evolving healthcare system of a country.

It is time that job satisfaction surveys be conducted on a regular basis in the provincial and federal sector public hospitals. The data collected will give an insight into the expectations of the workers, as well as provide the employee's views regarding the shortcomings in their workplace. These results can then be incorporated into human resources policies for healthcare, in order to provide better compensation packages, and give a clear job description to the employees; these, in turn, will help improve satisfaction of the workforce in future. It is advised that an all-inclusive approach be adapted to strengthen the policies addressing employee satisfaction, to bring a noticeable improvement in the quality and performance of the organization.

This study provides an insight into the various factors that need to be considered by policy makers, for uplifting the job satisfaction levels of the healthcare professionals; consequently uplifting the standard of the health care system in the governmental hospitals. If due care is accorded to these propositions, the hospital management and the Government of Nepal would in all probability be able to draw forth that elusive satisfied worker. The lack of previous studies applicable to this scenario also makes this study important. This study

hopes to contribute to the libraries of the Ministry of Health and Population for future planning with suitable interventions, to increase the level of job satisfaction among healthcare professionals, thus uplifting the standard of health care service delivery in government hospitals.

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GREEN BONDS IN INDIA: AN EMPIRICAL STUDY ON INVESTOR'S PERCEPTION WITH REGARD TO THE ISSUANCE AND THE GOVERNANCE CHALLENGES FACED

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ABSTRACT

'Green bonds' make up a novel and exciting field of finance, which requires global attention. They fall under the umbrella of 'green finance'. The earnings from green bonds are invested in ecologically beneficial initiatives. Green bonds function analogously to conventional bonds, with one key difference: the capital, or the pool of money, raised from investors is solely used to finance environmental projects, such as renewable energy and green buildings. This study, which was performed using secondary data, addresses investor perception, market acceptance, and the challenges faced by governing bodies and during FDIs. When it comes to green bonds, investors might explicitly turn out to be slightly bold. Their viewpoint assists us in comprehending how green bonds will be accepted as a form of investment in the future.

Keywords: *green bonds, green financing, Indian stock market, investor perception, governance challenges, sustainable finance, greenify*

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DECLARATION

We solemnly declare that this paper, "Green Bonds in India: An empirical study on investors' perception with regard to the issuance and the governance challenges faced", is an original work that has zero conceivable conflicts of interest in relation to the framing, research and/or publishing of this paper.

INTRODUCTION

Climate change affects us all. However, it is estimated that it will have the greatest impact on developing nations. Its possible effects on temperature, precipitation patterns, and sea level raise concerns about agricultural, food, and water supplies. One out of every eight million plant and animal species on the entire planet lies on the verge of extinction.

Green bonds are those bonds which were designed to increase sustainability and support particular environmental activities. Unilever issued £250 million worth of green bonds in March, 2014 with the stated goal of toning down the capacity of its present waste, water, and greenhouse gas emissions. Bonds are frequently audited by a third party, such as the Climate Bond Standard Board, which verifies that the bond will support projects with environmental advantages. The World Bank has deliberately orchestrated the issuance of about $14.4 billion in green bonds since the year 2008. Among the various financial institutions and the various asset management firms that have sponsored green bond mutual funds or Exchange Traded Funds are Allianz SE, State Street Corporation, Axa S.A., Blackrock, TIAA-CREF, AXA World Funds, and HSBC. State Bank of India sold green bonds worth $650 million on the India International Exchange and the Luxembourg Stock Exchange in November, 2021. In January 2022, ReNew Energy Global raised $400 million by issuing senior secured dollar notes with a 4.5 percent interest rate. From eight green bond issuances, the renewable energy provider's businesses have generated more than $3.5 billion in revenue. Moreover, Adani Green Energy Limited (AGEL) had come forward and managed to issue its first ListCo senior green bond in September, 2021, raising $750 million.

Yes Bank Ltd. (2015), Indian Renewable Energy Development Agency Ltd. (2017, 2019), Rural Electrification Corporation Limited or REC Ltd. (2017), Power Finance Corporation Ltd. (2017), Indian Railway Finance Corporation Ltd. (2017), and Adani Renewable Energy Ltd. (2019) are among the issuers that have been issuing green bonds with ten-year long or even lengthier maturities.

It was the World Bank that issued the first set of green bonds; this was done for the Rampur Hydropower Project that was executed in northern India. The green bond issuance was likely

expected to hit $269.5 billion in 2020, as per a report from the Climate Bonds Initiative. With $50 billion in new green bond issuances, the United States was the most active participant. According to the most recent Moody's figures, green bond issuance set a record high in 2017.

The signing of the Paris Agreement in 2021 may have marked a watershed moment in our efforts to save the earth. Although the United States is the largest producer of green bonds, the European market is fast developing, with $300 billion in issuance scheduled over the next five years. According to the Climate Bonds Initiative, India's annual issuance seems to have a probable measure to hit $1 trillion by 2023.

In the first eleven months of 2021, India managed to issue $6.11 billion in green bonds. Banks will enhance the issue of green loans to support their expanding lending activities. To achieve carbon neutrality by 2070, India will need $10.103 trillion in investment from domestic banks, NBFCs, and capital markets. Total investments needed for net-zero societies may exceed India's current GDP size.

REVIEW OF LITERATURE:

The history of green bonds explains their beginnings. Investors praised sovereign governments for prioritising environmental CSR when they began issuing green bonds to promote their green initiatives. Companies were encouraged to try to grow into environmental initiatives or R&D projects that are environmentally connected. As the globe moves toward sustainability, we will be able to see history unfold. (Cioli et al., 2021) Green bonds can entice investors, boosting issue size and helping to reduce financing costs for green public initiatives. According to the Green Bond Principles (GBP), green bond financing should result in evident environmental advantages that can be assessed or quantified by the issuer. Green Bond Certification is crucial for investors who want to be 'socially responsible investors' (SRI). The analysis is based on data from the issuances of the Polish and French governments. GBP SRI investigates the observed and anticipated effects of green bond issuances; especially government issues (Wiśniewski and Zieliński, 2019). They are intended to be a readily identifiable, low-risk financial product that allows both, investors and issuers to contribute to sustainability goals at a minimal cost. The green bond market has evolved into a new infrastructure inside capital markets, including green criteria, responsibilities to use proceeds, external validation, and reporting. This new infrastructure is changing the way capital market players interact, raising the bar for ESG performance (Maltais & Nykvist, 2020).

In 2007, the European Investment Bank (EIB) issued the first ever green bond to support the development of renewable energy projects. Green bonds can only have an impact if the initiatives backed by bond proceeds are one-of-a-kind (Park, 2018). CDM additionality testing, for example, may be useful in influencing this market characteristic. Advocates for a hybrid governance system that integrates the benefits of both, public and private governance have developed in this context (Flammer, 2020). The paper tackles a number of market difficulties, including an immature bond market, the prospect of 'green-washing', and regulatory concerns (Manaktala, 2020). The negative effects of issuing green bonds are the topic of this study. Green bonds are issued to support and enhance the executive projects that explicitly benefit the environment. Investors in affluent economies are suspicious of these bonds more than investors in emerging countries. Further study on this topic might include looking at investor reactions and behaviour in response to periodic green bond issuances (Lebelle et al., 2020).

The bonds in the S&P Green Bond Index have been investigated, and the impact and volatility induced by the Covid-19 pandemic have been assessed. Long-term bonds decreased during the inquiry period of the epidemic, while market value and yield to maturity looked to climb later on. There has been a positive trend since then. The negative shock linked with the purchase of green bonds was further alleviated, with a yield to maturity of 2.15 percent reported in March, 2020 (Keliuotytė-Staniulėnienė and Daunaravičiūtė, 2021). According to the statistics, approximately $1/4^{th}$ of the total pool of respondents had already been indulging with the bond market. The ESG ratings as well the credit ratings of green bond issuers happen to be the key variables given to investors' decision-making process. For the retail investors, responses were not uniformly distributed across the country, and the bulk of respondents were from two Indian states (Prajapati et al., 2021a).

METHODOLOGY

This paper makes use of secondary data through qualitative study from a variety of sources, including current news and, most notably, previous studies. We intended to investigate investor perceptions based on market sources and previous research, as well as the compliance objectives and gaps in the regulatory framework given by SEBI and the RBI. Foreign Direct Investment (FDI) is recognised by the market and the government, and supporting it makes a significant impact in reaching net-zero carbon emissions. These were examined using factual news. The data provides an overview of investor opinion, regulatory constraints, and the influx of FDI toward sustainable aims, and it aids in understanding the future characteristics of the green bond security in particular.

The objectives of this study have been derived from the research gap. They have been stated below.

1) To comprehend the investor perception of green bonds within India.

2) To comprehend the governance problems associated with the issuing of green bonds in India, as well as its future potential.

3) To study the trend of foreign investment in green bonds in the Indian stock exchange.

INVESTOR PERCEPTION TOWARDS GREEN BONDS

SEBI has developed rules for issuers to advertise bonds as green bonds, and the green bonds market is based on investor perception. There is no pre-issuance evaluation method outlined by the Indian law for analysing project evaluation and selection criteria for green bond funding-eligible projects.

The issuers must furnish SEBI with data on the use of proceeds that have been independently verified by an external auditor, alongside semi-annual and yearly financial statements. The issuer's annual report must include information on the project as well as the assets to which the green bond funds are being allotted. The reason for the issuer's inability to provide quantitative performance metrics should be disclosed in the annual report. SEBI may review the rules for green bonds in terms of transparency.

JSW Hydro Energy Ltd, a subsidiary of JSW Energy Limited, has raised $707M in foreign debt market (bond) in 2021. Green bonds have also been listed on the Bombay Stock Exchange's India INX at Gujarat Intl.; Indian issuers use Finance Tech City's International Financial Services Centre (IFSC) (GIFT City). Currently, nine green bonds traded on the India INX have raised $5.42 billion for Indian enterprises.

While the majority of the bonds are traded on Indian stock markets, JSW and Adani are expanding beyond the subcontinent. SEBI classifies Ghaziabad Nagar Nigam's 2021 bonds as green bonds since the revenues must be used for the installation of a third-level treatment plant by Ghaziabad's Indirapuram STP, which will then offer water quality as per the industrial requirements.

40.45 % of those who indicated that they were likely to invest in green bonds strongly agreed with the statement that their money will be used to improve the environment. The responses came from 18 different Indian states, with the bulk of respondents residing in Gujarat and Maharashtra. The conjoint analysis result has suggested that the highest utility and greatest

importance are assigned to the 'greenness of bond' attribute, which also supports the result of the regression model. The conjoint analysis finding is inconsistent with a previous study, which found that investors are prepared to invest their assets for a longer period of time (Prajapati et al., 2021b).

FINANCIAL OVERVIEW

As of February 12, 2020, India had $16.3 billion in outstanding green bonds. Approximately 4 years ago from today, since the 1st of January, India has issued approximately US$ 8 billion in green bonds. Green bonds accounted for barely 0.7 % of the bonds issued in India in 2018.

According to Graph 1.1, green bonds are those in which at least 95% of the revenues are dedicated towards green initiatives associated with the Climate Bonds Taxonomy. It represents the data up to November 28, 2021 only.

Businesses in India are becoming more concerned of their carbon footprint. In order to accelerate India's energy transformation, banks will boost green loan issuance to fund their increasing lending programme. In order to access a larger and deeper capital pool outside of their home country, more Indian issuers will resort to the offshore bond market. Due to comparatively favourable valuations and reasonable economic development prospects, green bonds issued by emerging nations such as India have a considerable attraction for overseas investors. As a result, the issue of green bonds in India in 2021 was remarkable, and it is expected to establish a new record in 2022. India raised $6.11 billion in green bonds in the first eleven months of 2021. It was the most outstanding since the issuance of the first one in 2015.

GOVERNANCE IN REGARDS TO GREEN BONDS

In December, 2007, the RBI also released a notification titled 'Corporate Social Responsibility, Sustainable Development, and Non-financial Reporting'. The National Action Plan on Climate Change (NAPCC) was established in 2008 with the goal of laying out a broad policy framework for minimising the effects of climate change. In 2015, the RBI expanded its Priority Sector Lending (PSL) strategy to include the small renewable energy industry. SEBI then issued a circular in 2017 defining the disclosure criteria for green bonds placed on domestic exchanges. India had announced an achievable target of 450 GW of renewable energy output by 2030 in the period of September, 2019.

REGULATORY CHALLENGES

1) Ensuring GSBs green: There are no consistent rules for determining whether activities qualify as approved green initiatives. As a consequence, the issuer relies on third-party evaluations to determine the greenness of undertakings. The third-party opinion may differ or cause doubts about the qualifying green initiatives. As a result, there is a lack of clarity on the qualified green initiatives, which creates the possibility of diverting profits to non-green projects. This is a breach of investment regulations and may jeopardise the green sovereign bonds (GSB) market's integrity.

2) Bondholders' ineffective contractual protections against 'defaults': In the case of GSBs, a key investment requirement that the issuer must adhere to is the use of money in certified green projects. The use of capital in non-green projects is not acknowledged as a default under the investment contract that governs the issuance of GSBs, according to the OECD's policy examen on green bonds, 'Green Bonds Mobilizing the Capital Market to Low Carbon Transition'.

3) The issue with greenwashing: Greenwashing is a key issue in the issuing of GSBs, when the issuer creates the false impression that the revenues will be invested in environmentally favourable initiatives. This occurs because there are no consistent worldwide definitions or market criteria for identifying green sovereign bonds or measuring the level of a bond's greenness.

Going Global: Understanding the trends of FDI with regard to green bonds in the Indian stock market

As it moves to a low carbon economy, India wants to sell sovereign green bonds worth at least 240 billion rupees ($3.3 billion). By 2070, India will require $10.103 trillion to achieve carbon neutrality. Total investments required for a net-zero society could be greater than India's current GDP. India is clearly a latecomer to the area of green bonds.

It has been initially said by Lakshmi Iyer, Chief Investment Officer for fixed income at Kotak Asset Management Co., that if a bond gives a lesser yield, it "may be more enticing to overseas investors given their growing interest in these sorts of bonds." According to Bloomberg, in the second month of the year, Indian renewable energy corporations raised a sum of 17.6 billion rupees in loans, the most in more than a year.

Climate change, according to India and other growing countries, would disproportionately harm them. At the COP-26 session in Glasgow, Prime Minister Modi made a significant

demand for $1 trillion in climate funding. This promise, however, has mostly gone unfulfilled. It was met with support from Brazil, South Africa, and others. On November 18th, CEEW-CEF released a study. According to Mitch Reznick, Federated Hermes' Director of Sustainable Fixed Income, reaching finance net-zero for India will demand access to the "huge reservoir of money that exists elsewhere."

Green FDI may be promoted by Canada and its major institutional investors while minimising climate concerns. Indian green bonds are issued in other mediums of monetary bills, specifically US dollars and Indian rupees. These investors' funds can be utilised to sponsor domestic green projects in India. According to the budget, green bonds are a component of the entire debt for the forthcoming fiscal year. In 2022–23, the government aims to borrow a record [1] 11.6 lakh crores from the market to help the economy recover from the COVID-19 outbreak.

Because many overseas funds are obligated to monitor global indices, attracting additional foreign capital is crucial. Non-resident investors can now purchase certain types of government assets, according to the Reserve Bank of India. The move is part of a larger push to diversify the bonds market. Globally, numerous large institutional investors, such as the Bloomberg Barclays Emerging Market Bond index, follow these indices for positioning decisions on sovereign papers.

SUGGESTIONS

While the green bond scenario in India is improving, there are only two labelled Indian Bonds registered in 2022 for the period of February to April. Hundreds of bonds are available in the US, Europe, China, and Japan, among other geographical locations.

SEBI should develop its own criteria for determining the greenness of green bonds, which would let SEBI adhere to their own rules rather than having bifurcated regulations from across the world. Green bond investors should be given contractual assurances on the bond's greenness at the time of issuance.

1) Make 'green use of proceeds' a contractual obligation: This may involve making 'green use of money' a contractual obligation in an investment contract. In the case of a breach, this will trigger the contractual protection and provide investors with recourse.

2) Developing guidelines for 'eligible green projects': Because there are no market standards or standardised rules for deciding whether projects or activities are acceptable as green projects, Indian regulators should create guidelines for identifying qualified green projects.

3) Penalties for 'defaults' are being implemented: For the life of the investment, the revenues of the GSB issue will be invested in green projects. Non-compliance with green money usage, in my opinion, should be seen as a contractual default, with corresponding consequences. What constitutes as contractual 'defaults' must be defined.

4) Incentivize achievement of green actionable goals: This will provide investors with clarity and assist them in making investment decisions. This will motivate issuers to reach their specified actionable goals. Tax breaks might be used as motivators.

India is currently Asia's second largest issuer of green bonds, after only China. In order to meet the government's sustainability objectives, India must continue its current pace. This will demand both, foreign investment and a greater engagement of local tycoons or recognised industry leaders. Only if trustworthy institutions generate a buzz about green investments, will FDI increase.

CONCLUSION

Green bond issuance is expected to drastically impend a rise in future years as the government approaches the COP-26 targets. Between 2022 and 2024, Indian firms will raise $25 billion in green bonds, according to the Bank of America. There is no explicit law that legitimately oversees the issuance of these bonds at the current scenario of regulatory operations in India. Prior to the issuance of SEBI's circular (2017), issuers categorised their bonds as green bonds based on international criteria.

However, the Indian market lacks a source of capital dedicated to sustainability; in the absence of a considerable rate disparity, commercial banks and institutional investors should be uplifted to become involved in green bonds, by requiring them to commit a certain amount of their assets to sovereign green bonds. After speaking with relevant players, the report may be utilised as the foundation for future research on investor attitudes, regulatory difficulties, and developments in the Indian stock market. With lofty goals of generating 175 GW of renewable energy by 2022, India may fall short if action is not taken quickly. Investing in the future of the environment has never been more significant than it appears to be in the present scenario. As a result, financial agents have a significant chance to intensify their efforts to achieve long-term goals.

Altogether, while the green bond market in India is still in its infancy, it is likely to develop rapidly in the short term, enabling domestic businesses to acquire long-term funding at a reduced cost. As a result, their role in promoting openness and ensuring compliance with SEBI's reporting obligations in India remains critical.

LIMITATIONS

This paper provides scope for future research on the topic. This scope has been written as the limitations of the paper.

1) The report does not include current investor perceptions based on primary data.

2) The study does not narrow down to a particular sector or population; instead it provides a bird's eye view.

3) The study does not cover the Green Bond Principles and the credit rating criterion with regard to the Indian stock exchange.

4) The study would be more effective with data related to the bonds currently circulating in the market, with their total greenness, as perceived by the Climate Bonds Initiative.

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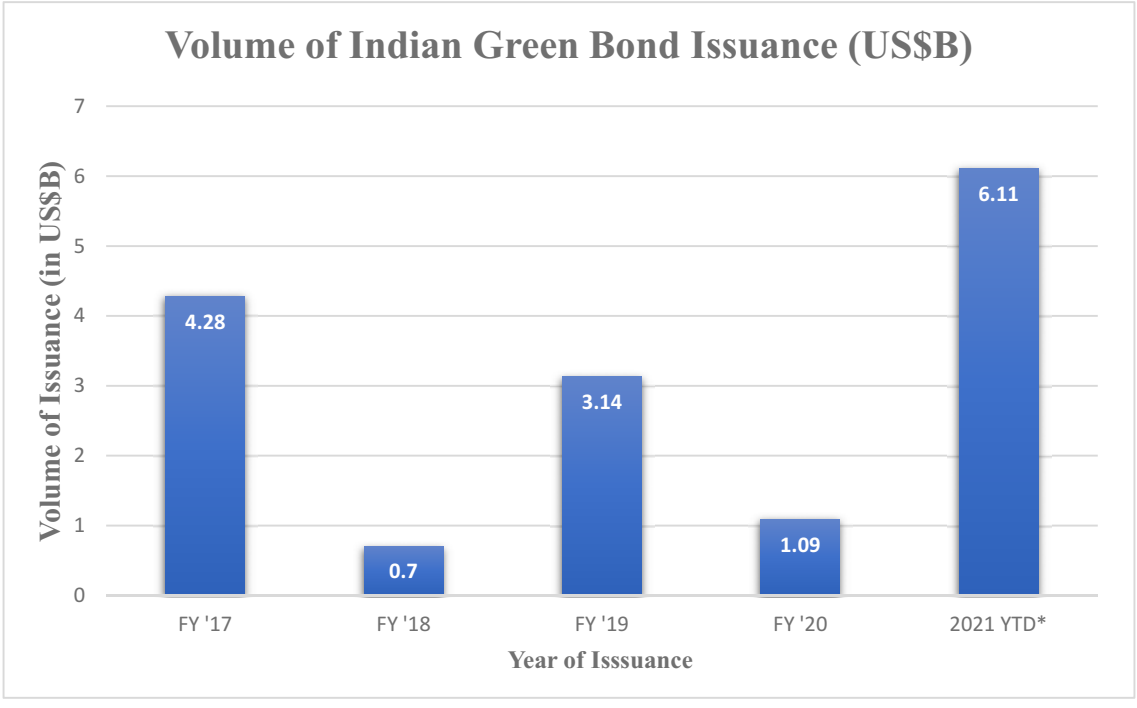
Tables and graphs

Table 1.1: Six Green Bonds listed on India INX with addition to their interest value.

Issuer	Amount	Annual Percentage Rate (IR)	Term (In years)	Exchange	Division
Ghaziabad Municipal (2021)	₹1.5B	8.10	10	Bombay Stock Exchange	Sustainable water management
Yarrow Infrastructure Private Limited (2021)	₹5.81B	6.49	3	Bombay Stock Exchange	Solar energy
JSW Hydro Energy Limited (2021)	$707MM	4.13	10	SGX	Hydro-energy projects
ReNew Wind Energy Delhi Private Ltd. (2021)	$585MM	4.50	7	India International Exchange Limited	Wind and solar energy generating assets
SBI (2019)	₹650MM	4.50	5	India International Exchange Limited	Renewable energy, low-carbon establishments, waste and emission reduction transactions, environmentally friendly transportation and manufacturing, and energy-intensive business transactions.
Adani Green Energy Uttar Pradesh Limited, Parampujya Solar Energy Private Co.	₹500MM	6.25	5	SGX and India International Exchange Limited	Solar-powered projects

Source: https://www.acuitylaw.co.in/publication-and-news



Source: Climate Bonds Initiative, 2021.

Graph 1.1: Volume of Indian Green Bonds Issuance (US$B)

LEARNER AUTONOMY IN THE CONTEXT OF NEP 2020

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Learner Autonomy in the Context of NEP 2020

ABSTRACT

Domain-specific, professional, soft skills, and lifelong learning abilities are very important for 21st century students. In the learning process, learner autonomy and autonomous learning are the most important factors, which make students more responsible, accountable, and mature enough to achieve learning outcomes and career goals. A brief account of ideas on autonomous learning in the context of NEP 2020 is presented in this paper. The teachers, students, and learning environment play a significant role in encouraging and promoting autonomous learning in the institute. Therefore, roles and responsibilities of teachers and students, the paradigm shift required for autonomous learning, implementation of autonomous learning, and barriers to autonomous learning are briefly described. A brief literature review shows that autonomous learning of students' results in enhanced motivation for learning, assuming responsibility for learning, making students accountable for learning, developing learning to learn skills, and maturity for learning. Autonomous learning is aligned with the needs and aspirations of the students.

Keywords: autonomous learning, autonomous learner, role of teacher, role of students, NEP 2020.

INTRODUCTION

There are provisions in NEP 2020 to develop students as well-rounded across disciplines, which is not possible using highly structured pedagogical approaches. Students need autonomy to learn in their own way, considering their aptitude, attitude, learning potential, career preferences, availability of time, and other environmental factors. Autonomy associated with the learner is defined as a 'method to education with which learners grasp the power to regulate and govern their educational activities. They know their own learning needs and accordingly, they can control their learning process to achieve their desired learning outcomes. They are moving towards maturity in learning, and they can manage their learning process. They consciously or unconsciously use principles of adult learning, feel accountable for learning, and make decisions related to learning. In outcome-based learning, the responsibility of learning should gradually shift towards learners. There are many synonymous words and terms used for autonomous learning, such as self-learning, learner-centric learning, self-directed learning, flexible learning, and active learning (Taylor, 2020). Students make decisions about what to learn, when to learn, how to learn, what is the deadline for learning, where to learn, and with whom to learn. They want flexibility in the learning process. The philosophy of autonomous learning needs to be effectively and efficiently implemented in higher education institutions to effectively implement outcome-based education, develop skills of the 21st century, and develop cultural and ethical skills in students. Autonomous learning should not be seen as individualized learning. Learning may be very well organized in autonomous learning teams, which are formally and informally created in institutions for learning purposes. Quality circles, student clubs, hobby communities, various student committees, and professional body chapters are good examples of systems that support autonomous learning. Autonomous team learning will result in the development of leadership, team work, creativity, effective communication, reflective learning, critical thinking, and interpersonal skills in the student. Autonomous learning will contribute to achieving the vision of NEP 2020, i.e. quality education and excellence. Teachers play the role of facilitator, guide, coach, mentor, problem solver, motivator, and feedback provider in individual as well as team learning. Autonomous learning is encouraged in higher education institutions, following the principles of education technology, education management, and educational psychology. In the context of NEP 2020 these principles are — active involvement of students using activity-based learning for achieving learning outcomes, providing options in program structure, completing tasks, creating choices and providing decision-making opportunities for students to make them

accountable for achieving their learning goals, supporting learners by providing learning resources, guidance to perform tasks, encouraging reflection using well-defined assessment criteria to assess the learning outcomes (Simon, 2012). Observation sheets, rating scales, and rubrics are commonly used in outcome-based assessments using self-assessment and peer-assessment techniques.

The theory of constructivism (Vygotsky, 1978) is being used in higher education and training programmes to develop predefined competencies in the students. The students should be able to form and reform the concepts and principles based on their learning experiences that will foster creativity and readiness to learn abilities, in the students. Autonomous learning takes account of different learning styles of individuals, their learning pace, and their learning mood, among other things. The creation of SWAYAM by the Ministry of Education, opened up many opportunities for students to opt for autonomous learning for many courses. A good blend of formal autonomous learning online and offline, guided by course teachers, will ensure the success of autonomous learning.

Learner autonomy initiates the process of facilitating the setting of career goals aligned to the potential of each individual. The learners are encouraged to design their strategies to achieve the career goals. They are encouraged to identify and mobilize the learning resources needed for achieving career goals. They are made aware of various self-learning tools and techniques which they may use anytime and anywhere. Self-learning is encouraged by the course teacher, by designing learning challenges in the form of challenging projects and assignments for the students. The maturity of the students is enhanced for autonomous learning by conducting awareness workshops on autonomous learning. The students move through the stages of teacher-made decisions, consultation, involvement, and empowerment, to become autonomous learners. In the context of NEP 2020 and the progress of 21st century skills, autonomous learning is going to play a major role. It will take students towards higher learning, lifelong learning, and purposeful learning which is essential for the twenty-first-century learners and professionals (UGC, 2019a, UGC, 2019b).

CONCEPT OF LEARNER AUTONOMY IN THE CONTEXT OF NEP 2020

NEP 2020 states that by 2035 all higher education institutions will be autonomous institutions, meaning that the autonomy will percolate down to decision-makers, including students. The learners are expected to acquire lifelong learning skills and develop multidisciplinary abilities. They are expected to develop 21st century skills to become effective learners and citizens of the country (UGC, 2019a, AICTE, 2018). Provisions for learner autonomy have been made in NEP 2020 in the form of multiple entry and exit, minor degree, multidisciplinary education, certification of competency, integration of vocational education,

entrepreneurship development and use of online learning, and credit bank. (Mridul et al., 2020, Aithal, 2020). There are well-established approaches related to autonomous learning, which emphasize making the students active participants in the learning process. In higher education institutions problem-based and project-based methods of teaching are commonly used. There are other methods such as the case method, discovery learning, and creativity techniques which are used by a limited number of faculty members. The other methods which are becoming important are action learning, team learning, discussion, and debate-based methods. In some disciplines, teachers have started using inquiry-based and interview-based methods. The attitudinal development methods such as multiple role-play, simulations, and cooperative and collaborative learning are being used by trained teachers. These instructional methods need to be institutionalized to encourage and promote autonomous learning at the institute level.

Autonomy is important for creating a conducive study environment, academic space, independence, and flexibility. This type of teaching autonomy acts as a bridge between the system and admin services, and planning for curriculum development (Sehrawat, 2014).

Against the backdrop of the above discussion, we define autonomous learning as a process of empowering students to make decisions related to the selection of learning outcomes, learning methods, learning resources, learning time, learning duration, and learning environment, in a guided and facilitated environment by teachers. It is a process of development of abilities (cognitive, affective, psychomotor, social, and information communication technology) in a flexible and open learning environment. During the initial years of study, guided and facilitated learning will take students towards learning maturity and empowerment. There have been many promoters of the concept of autonomous learning in different contexts and at different points in time. The concept evolved in this paper is based on their work (Otero, 2015, Luk, 2020, Yu, 2017, Deng, 2007, Lumturie, 2015), and the work of the authors.

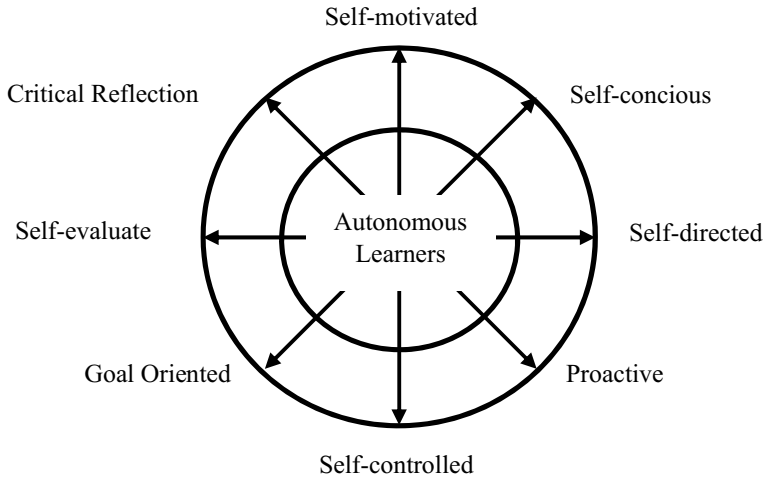

Figure 1: Characteristics of autonomous learners

PARADIGM SHIFT FROM TEACHER CENTRED LEARNING TO AUTONOMOUS LEARNING

The general approach to autonomous learning, developed by Hayo (2010) has been adapted in articulating the major shift from teacher directed to autonomous learning in the context of NEP 2020 and outcome based education.

Table 1: A paradigm shift from teacher centred to autonomous learning

Criteria	Teacher centred	Autonomous learning
Learners	External locus of control	Internal locus of control
Learner needs	Assumed in the curriculum	Identified by the learner
Learning goals	Defined in the curriculum	Defined by individuals
Learning plan	Course plan prepared by the teacher	Prepared by students
Instructional method	Teacher centred	Self learning
Learning resource	Provided by teacher	Self explored
Use of internet	Limited	Extensive
Learning problems	Solved by teacher	Solved by students
Theory of learning	Directive	Constructivism
Learners	Treated as child	Treated as adult
Principles	Pedagogy	Andragogy
Role of the teacher	Structured	Mentor, facilitator, and guide
Development of skills apart from domain-specific skills	Listening and notes taking	Planning, communicating, problem solving, evaluating, observation, reflecting, investigating, self motivation, learning to learn, thinking to think
Assessment	Formal and external	Formal and informal by self and peers on predefined criteria
Feedback	By teacher (positive or negative)	Self feedback and peer feedback
Behaviour of students	Dependence on teacher	Autonomous
Outcome	Graduate	Professional

ROLES AND RESPONSIBILITIES OF TEACHERS IN PROMOTING AUTONOMOUS LEARNING

Teacher autonomy is a prerequisite to student autonomy. The requirements of successful teaching are not only to teach students in academic areas, but also to understand students' characteristics in terms of personal and cultural aspects. To achieve this purpose, teachers need to be flexible in teaching and creating a supportive learning environment (Cao, 2012). The main role of the teacher is to develop the capacity of learning to learn, and learning to liberate, in students (Nima, 2012, Ligang, 2014). The generic teacher role is defined by many scholars in different learning contexts for different learners. Some of the generic roles are stated in Figure 2:

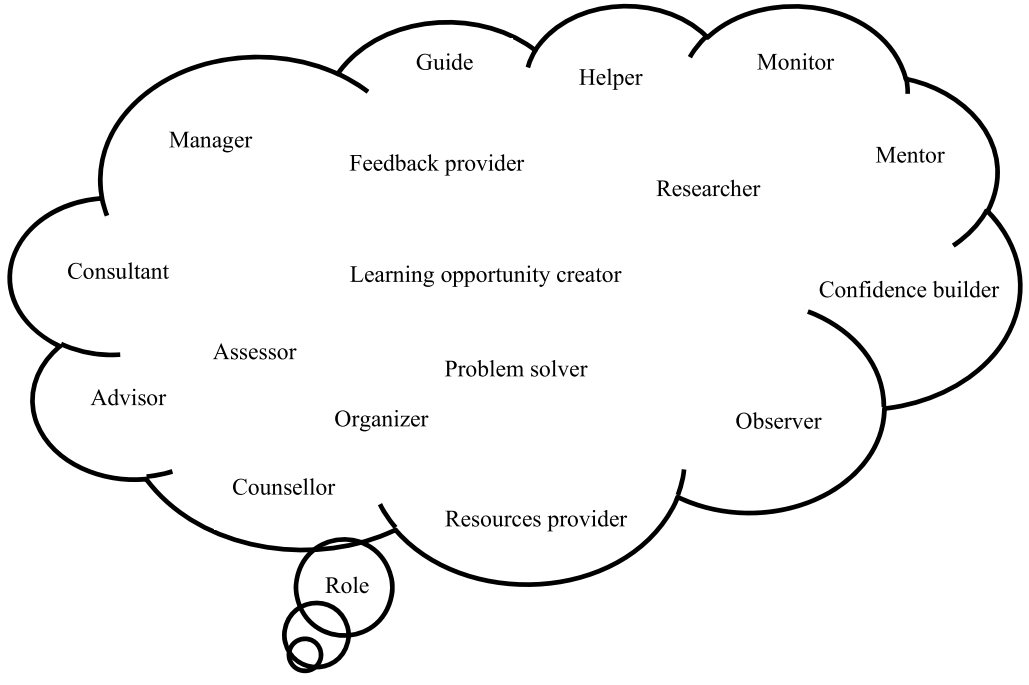

Figure 2: Generic role of the teacher to implement autonomous learning

This generic role is derived based on the literature review (Rosalba, 2006, Lumturie, 2015, Agnieszka, 2015), principles of andragogy, requirements of NEP 2020, and twenty-first century skills. It is the responsibility of teachers to promote learners' autonomy in educational programmes. Teachers should create awareness among students, about the benefits of autonomous learning in their lives. Teachers should create opportunities for cooperative, collaborative learning within the classroom and outside the classroom. They

should involve students, not only in participating in learning activities, but also in assessing their own and others' learning. In the context of NEP 2020, the essential roles and responsibilities of teachers for developing learner autonomy have been stated below.

Programme structure design: The design of the educational programme structure should facilitate the inbuilt flexibility with respect to choosing courses of related and multiple disciplines, freedom to enter and exit from the programme, alternative options to develop a competency, account for credits of courses earned through different means, and opportunities for industrial internship and projects. This provision has been made in the NEP but it needs to be implemented in institutions. There has been such experimentation in polytechnic education, which has proven to be successful in developing well-rounded students.

Course plans: The course teacher should design the course plan considering student-centric approaches. The active involvement of students can be ensured by using outcome-level tasks, activities, projects, seminars, self-learning activities, and role plays.

Learning resources: The teacher should create a bank of varied learning resources for various courses. This resource bank should be available on the learning management system of the department. These learning resources should be drawn from the world of work situations to develop higher level abilities in students. The resources may be e-books, video programmes, case studies, simulations, reports, and manuals.

Create an environment for autonomous learning: In outcome-based education, the teacher creates the environment for learning of the students using projects, activities, assignments, and reflective practices.

Offer feedback: Teachers should have recent knowledge and real-life experiences to provide feedback to students on their learning progress, learning problems, and solutions to learning problems. The teacher should be good at providing individual and group feedback.

Assessment system: The teacher should be able to design self and peer assessment systems for autonomous learning. The assessment system should also motivate the students to self-learn and assess.

Use particular and casual methods in teaching: Teachers should use particular and casual methods in teaching in order to promote learners' autonomy. Autonomy is categorized into three groups — achievement agency, emerging motivation, and gaining alertness. Teachers are completely free to understand their manuscripts and answerable for their

learning from them. Teachers interpret the courses in a variety of ways that differ according to their importance on specific aspects, such as drive, identity, and agency.

Use information communication technology: Teachers should be able to use information communication technology to encourage learning at anytime from anywhere. Teachers should be available at a predefined time to interact with students for facilitating learning, and to motivate them for learning. Teachers should be able to manage virtual learning and MOOC based learning to cover thousands of autonomous learner students at a time. Mobile learning platforms at the institute level have an impact on autonomous learning (Priyatno, 2017). The information (learning resources) available on the websites of organizations quickly updates the teachers and students about developments taking place in the world of work. Students need to be encouraged to browse through the websites of relevant organizations for completing activities (Xin, 2016).

ROLES AND RESPONSIBILITIES OF THE STUDENTS IN AUTONOMOUS LEARNING

In the context of outcome-based education and NEP 2020, there has been a growing use of learner-centric pedagogy. In practice, learner-centric pedagogy is employed by teachers using their common sense. Most of the teachers are not trained in learner-centric pedagogy. Therefore it is not clear to them, how they should facilitate the learner-centric pedagogy. The learners need to develop certain skills (notes taking, reading, writing, investigating, thinking, reflecting, taking self feedback, self motivation to learn, introspection, self assessment, looking for the right sources of learning, mobilizing resources for completing assignments and projects) to become autonomous learners, individually and in groups (Hayo, 2010). For the success of outcome-based education, students must understand the responsibilities towards self-learning under the guidance of programme faculty, because learner autonomy directly belongs to the study and career of students. Self assessment is an essential element of learner autonomy. Students must build their capabilities for achieving learning outcomes formally and informally. They should be able to analyse their strengths and weaknesses with reference to learning outcomes. The necessary roles and responsibilities of students in autonomous learning are stated below:

Develop learning skills: Students should be able to set goals, conduct learning needs analysis, engage in self learning and team learning, reflect, conduct self evaluation, introspect, investigate, set priorities, and look for learning resources.

Assess learning needs: The assessment of learning needs aligned to career goals is an important role in autonomous learning. Proactive students have many learning needs, but

because of the paucity of time and resources, they can not fulfil all the needs. This calls for prioritization of learning needs based on strong and direct criteria.

Initiate learning: Students should be able to remove any resistance to learning individually and in groups. They should be able to plan, implement, control, evaluate, and reflect on their own to manage the complete learning process.

Seek guidance: Students should be able to seek guidance and mentoring in learning situations from the resource persons. They should be able to convince the resource persons to provide guidance and mentoring.

Remove obstacles: Students should be able to remove obstacles and solve problems on their own, with peers and faculty members. In some situations, they may require the help of industry resource persons.

Grabbing the opportunities: Students should be able to grab the opportunities for learning which are available in the institute and outside the institute. There are several events organized by industries, education and training institutes, research organizations, professional societies, and government agencies.

Evaluate achievement of outcomes or goals: Students should be able to generate direct and strong criteria to assess the achievement of learning outcomes or career goals.

IMPLEMENTATION OF LEARNER AUTONOMY

In the context of NEP 2020, a favourable environment is being created in higher education institutions to implement learner centric approaches. Autonomous learning can be easily implemented at the institute level by trained teachers in learner centric approaches. Initially, there will be some trivial obstacles but gradually the institutional leadership is likely to be able to deal with such obstacles and implement autonomous learning. In an academic institution, the teacher is a creator of an autonomous learning environment at the institute, department, programme, course, and class level. The teacher directly interacts with stakeholders and students. It is obvious that the teacher role cannot be eliminated from the higher education system, but it can be lightened by shifting the responsibility of learning to students. Teachers can play a design role for various elements of the instructional process such as learning resources, assignments, projects, assessment tools, and the like. They can gradually shift the whole institute from a teacher centred principle to a student empowerment principle as stated in Figure 3.

Figure 3: Moving towards empowerment

The gradual shift from being teacher centred to being empowering for students may take time. The institutional leaders, teachers, students' proactive-ness, and designed efforts take the institution forward in the direction of autonomous learning.

Involve students: The heart of autonomous learning is the intensive involvement of students in the learning process. They should be encouraged to give ideas and express their views in designing and implementing curricular, co-curricular, and extracurricular activities of the institute. The involvement of students in the decision-making processes will result in motivation, commitment, and action (Nima et al. 2012).

Identify the path concerning motivation: There is a direct link between learner autonomy and motivation for learning, as students get the opportunity to relate learning with their needs, preferences, time, and resources. They see that learning is important and they cannot ignore it at any cost. Autonomous learning is based on principles of adult learning, such as — adults learn when the learning is meaningful, adults learn through experimentation and struggle, adults learn from their mistakes, adults learn from introspection and self feedback, adults learn from mistakes and reflection. Autonomous learning can be implemented through concerning learner ideas. Autonomous learning creates further motivation to learn.

Develop relevant curriculum: The curriculum should be developed from the perspective of the world of work and the needs and aspirations of the students. The purposeful curriculum will enhance the motivation of the students for learning, and encourage industry to contribute resources for autonomous learning. Accommodating the needs and aspirations of students in the learning agenda enhances learner motivation to the highest degree (Zejun et al. 2012).

IMPLICATION OF USING AUTONOMOUS LEARNING IN HIGHER EDUCATION

Outcome-based education and well-rounded development of students cannot be imagined without the implementation of autonomous learning. Educational leaders, teachers, and students should be prepared to implement autonomous learning. Higher education institutions have transformed from teacher centeredness to learner centeredness, and

institutions are becoming autonomous to make their own academic decisions. Autonomous institutions can easily promote autonomous learning institute-wide (Ligang, 2014). The implications of using autonomous learning in higher education have been stated below.

E-learning platform and language communication: Priyatno (2017) evolved learner autonomy using an e-learning platform for a class at an Indonesian university. This study concluded that mobile platform learning can minimize the dependency of students upon the teacher. The institute created Schoology, an m-learning platform. Sivakami (2016) reviewed studies on learner autonomy and concluded that researches can also be done on similar lines, utilizing different e-learning tools such as e-forums and e-portfolios for identifying the suitability of electronic media, in the in-classroom and out-of-classroom learning contexts, to ascertain the impact of these tools on the autonomous leaning of different types of learners.

Campus based programs: Campus based programs try to bring the world of work to classrooms and laboratories where students can learn on their own, individually or in groups. Course teachers should be trained to design tasks, assignments, and activities that match with the learning outcomes. In these tasks, students get involved individually and in groups.

BARRIERS AND DIFFICULTIES IN PROMOTING AUTONOMOUS LEARNING AT THE INSTITUTE LEVEL

There are many barriers and difficulties in promoting autonomous learning in higher education institutions.

Lack of policy: There are no policies and guidelines available at the institute level to implement autonomous learning throughout the institute uniformly.

Lack of skills to use autonomy: Students are not groomed to do autonomous learning, so they do not possess skills to manage learning on their own. Even when one or two teachers create the opportunity for autonomous learning, they are ignored by the students.

Lack of opportunity: Students do not get opportunities within and outside the institute to learn on their own. In other words, it is not planned at the institute, department, and programme level by the institute.

Lack of ability in teachers: Teachers are not trained and groomed to encourage autonomous learning. They are practicing the strategies which have been used by their teachers and which they are exposed to.

Lack of learning utilization centres: Institutions only have a library. Very few institutions have their own learning management and learning resources utilization centres.

Lack of autonomy: Institutions need to follow the university calendar and provisions of a regulatory body, which are rigid, and the performance of the institute is assessed on these criteria.

Lack of confidence: Teachers and students do not have the confidence that they will be able to use autonomous learning, or that learning outcomes will be achieved.

Large class size: In higher education institutions, the commonly used class size is 60 students which goes up to 120 in some cases. It is difficult to guide such a big class of students coming from different cultures, languages, and backgrounds.

Different entry behaviour of the students: Students enter higher education from different backgrounds and from varied levels of quality of education, which creates a challenge for the course teacher when it comes to designing common activities for all of them.

Similar barriers to autonomous learning have been reported in previous research papers in a different environment (Saleema, 2017, Luk, 2019, Xin 2016).

CONCLUSIONS

In the context of NEP 2020, autonomous learning needs to be implemented in higher education institutions. At the institute level, there should be autonomy to choose the educational program. Within the program structure, there should be autonomy to choose the courses, and within the course, there should be autonomy to choose the learning methods. At the institute level, policy and guidelines should be prepared for teachers and students to grab the latent potential of autonomous learning and reap the fruits of it. The teachers should be intensively trained to design and implement the autonomous process of learning to enable students to achieve their desired learning outcomes and demonstrate them. The concept of autonomous learning will empower students and teachers to make their own decisions, and enable them to become lifelong learners. Autonomous learning can be enhanced using blended learning, MOOC based learning, learning assignments, industrial projects, and virtual learning. Self learning skills, reflective skills, self feedback skills, and introspection skills of students play a significant role in promoting autonomous learning.

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WORKERS' WORK–LIFE BALANCE SHOULD BE A PRIORITY FOR THE HUMAN RESOURCE DEPARTMENT

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ABSTRACT

Workers don't like to sacrifice their personal lives because of their job imperatives. Work and personal life are essentially two different scales of a spring balance and any adverse movement, either at the workplace or in personal life is likely to disturb the balance. Work-life balance has always been fraught with challenges, which have of late assumed significant proportions, and are considered to be among the most pressing concerns for workers today. It has been observed that the population of working couples has been on the rise and this has led to a greater scope for work-life conflict. Organizations are realizing that the quality of workers' personal lives has a direct bearing on their job performance. This underscores the need for organizations to promote work-life balance to safeguard their business interests. In this paper, we have made an attempt to highlight why work-life balance policies should be promoted and be a core part of an organization's human resource policy to optimize their business interests.

Keywords: *work-life balance, human resources, worker, organization*

Introduction

The question that is often asked is whether we work to earn a living or live only to work. Perhaps, both are equally true. Scholars have opined that work and family are the two most important facets in the life of a working person (Greenhaus et al., 2003). An individual working for an organization would not like to sacrifice his personal life for work. He would instead prefer to strike a fine balance between the two, so as to lead a happy, healthy, and productive life.

The task of balancing work with personal life is one of the most pressing challenges for workers (Valcour, 2007). Research has shown that workers who have a work-life balance have higher levels of job satisfaction, and perform much better in their jobs. Such workers are also seen to be loyal and committed to their organizations (Rawlings et al., 2012).

Globally, organizations are implementing a variety of measures to increase their revenue and profitability, which includes downsizing, increasing working hours, and setting aggressive sales targets for workers. This is resulting in placing more demands on the workers. The logic given for this is the need to stay afloat during tough economic times. As a consequence of this, the more time a worker devotes to work, the less time he has for family. This results in work-life conflict, and has negative ramifications for both, the organization and the worker.

In this paper, we argue that helping workers achieve work-life balance should form a central component of the human resource policy of an organization, so as to get the best out of the workers without leaving them burnt-out.

Defining work-life balance

Work-life balance can be defined as "good functioning both at work and at home with minimum role conflicts" (Clark, 2000). Work-life balance is about getting the right balance between one's job and one's personal life. It is about feeling comfortable with one's work and non-work commitments.

Work-life balance practices

Organizations have observed that a worker's personal life has a direct bearing on the productivity and quality of work; and therefore, there seems to be a strong business case to promote a culture of work-life balance (Lockwood, 2003). The choices available with organizations to promote a culture of work-life balance are:

1. Flexi-time work schedule: This gives the workers some freedom to choose their own working hours within the guidelines stipulated by organizations. This helps them attend to their personal chores without having to take time off from work.

2. Compressed work week: Workers in a compressed work week work for four days in a week instead of five days. However, these workers work for ten-hour shifts instead of eight-hour shifts each day. This scheme helps workers get an extra day off to attend to their personal chores.

3. Job-sharing: This is a system wherein a worker is allowed to share his job with some other worker, thereby reducing work hours. Under this arrangement, the wages and fringe benefits are proportionately reduced for each worker within the overall framework of the organization. This helps those workers who have extra personal responsibilities, and are likely to need more time each day to attend to them.

4. Telecommuting: Workers, with the help of modern information and communication technology, can do their work from home without having to come to the office on a regular basis. Telecommuting allows workers to take care of family responsibilities without having to sacrifice their work demands.

The consequences of work-life conflict

There is strong evidence that work-life conflict leads to several negative consequences for the workers, their families, their employers, and the society at large (Allen et al., 2000).

The possible repercussions of work-life conflict for a worker could be:

1. Distress in their personal life

2. Health disorders

3. Lower level of job satisfaction

4. Conflicts, which may lead to violence

5. Alcohol and drug consumption

Work-life conflict in a worker's life may lead to the following negative consequences for the organization:

1. Increase in absenteeism rate

2. Increase in attrition rate

3. Reduced productivity

4. Decay in the quality of work

The advantages of work-life balance

Maintaining a healthy work-life balance is a key ingredient of a good business strategy (Lowe, 2006). Work-life balance is a necessity for both, the worker and the organization. This is a springboard for personal growth of the worker, as well as for the business growth of the organization.

According to Iyayi et al. (2012), the benefits of policies promoting work-life balance for the workers are:

1. Happy and satisfied workers

2. Reduction in the stress levels of the workers

According to Iyayi et al. (2012), the benefits of policies promoting work-life balance for the organizations are:

1. Workers are highly motivated and give their best performance on the job

2. Workers' productivity levels remains high

3. Absenteeism rate remains low

4. Attrition rate comes down

5. The organization emerges as an employer of choice for the prospective workers

6. It fosters a good relationship between the organization and the workers

7. It improves communication between the workers and the organization

8. Workers tend to be more loyal and committed to the organization

The role of the HR department in developing a healthy work-life balance programme for the organization

Globally, a large number of workers encounter work-life conflict in their daily life (Lockwood, 2003). Workers are expected to sacrifice their family commitments to meet the demands of the organization. As a result, a large proportion of workers fail to achieve their career and personal goals in a satisfactory manner. There is a felt need amongt workers for the organizations to prioritize the implementation of a healthy work-life balance policy (Ojo et al., 2011). Organizations need to ensure that work-life balance forms a central part of its HR policy (Rawlings et al., 2012). The work-life balance policy should be framed keeping in view a worker's daily life in totality, and not in terms of work hours only (Elloy and Smith, 2003).

The HR department needs to understand the imperatives of the organization to ascertain whether or not the work culture is conducive for supporting and implementing work-life balance initiatives for its workers (Reynolds, 1999). This assessment will help to bring out the unique work-life balance needs of the workers. Workers at different stages may have different work-life balance needs. The insights gained from such an assessment would be helpful in formulating a customized work-life balance policy for various employees.

The implementation of a work-life balance policy necessarily requires the support of senior management in the organization. The HR department should, therefore, take the senior management on board at the policy formulation stage itself. This would help in effective implementation of the work-life balance policy (Parker et al., 2006). Managers in the organization should take a lead in using work-life balance measures available in the organization. This will dispel any fears among the subordinates regarding the possibility that the usage of work-life balance measures may be seen negatively by their managers. This will, consequently, help in promoting a healthy work-life balance culture in the organization (Baral and Bhargava, 2011).

The organization should properly publicize its work-life balance policy and also create awareness among the workers about the policy. This will enable workers to understand the benefits of the policy, and thereby, increase the adoption of the policy's various measures, thereby helping to mitigate work-life conflict situations (Ojo et al., 2011).

Difficulties in implementing a work-life balance policy

It has been found that a very low percentage of workers actually make use of the work-life balance policy in organizations (Spinks, 2004). The reasons cited for this are lack of information, and proper understanding of the benefits accruing from the policy (Ojo et al., 2011).

The reason given for the low utilization of the work-life balance policy relates to the workers' misconception that the users of the policy are unfairly treated at the time of reward allocation, progression opportunities, and salary increments (Dex and Smith, 2002).

Traditionally, working long hours was considered 'hard work' by the managers. A majority of the workers wanted to be perceived as being 'hard working'; and therefore, they hardly utilized the benefits of the work-life balance policy provided by the organization (Blair–Loy and Wharton, 2002).

It was seen that career ambitions discouraged many workers from adopting the work-life balance initiatives. Such workers focused only on work, and sacrificed their personal life, which eventually led to them suffering from burn-outs, with adverse consequences for themselves and for the organization (Rawlings, 2012).

Often, the work-life balance policy is formulated by the organization without properly understanding the needs of their workers. In such a scenario, though a policy on work-life balance is in place, it hardly has any takers; the reason being that the workers did not find any value in the measures framed under the said policy, making them reluctant to use it, thus, resulting in poor participation (Dex and Smith, 2002).

Conclusion

Any organization with a healthy and worker centric work-life balance policy offers a win-win proposition for the organization and its workers. A healthy and worker centric work-life balance policy builds a positive perception of the employer brand in the labor market. It also facilities reduction in stress levels, increase in happiness, increase in motivation, and enhanced productivity among workers. This eventually helps workers in achieving both, their personal and professional goals, in a satisfactory manner. The role of the HR department here is to champion the cause of smooth implementation of the organization's work-life balance initiatives, and to integrate them into the culture of the organization.

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DETECTING NEGATIVE ATTRITION USING PREDICTIVE ANALYTICS

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Mohd Abu Faiz**

ABSTRACT

Employee attrition is a significant problem in companies, especially when trained, technical, and efficient employees leave for unknown reasons. An employee leaving an organization creates a void and spawns an environment where other employees also start to think along the same lines. Therefore, companies should predict the reasons for negative attrition and motivate employees to continue by making slight adjustments. Using a sample (n=1470) from the IBM dataset, this study considers the role that company characteristics (Business Travel, Daily Rate, Department), workforce characteristics (Environment Satisfaction, Job Involvement, JobLevel, JobRole, Job Satisfaction, Relationship Satisfaction), and employee benefits (Stock Option Level, Training Times Last Year, Work Life Balance, Percent Salary Hike, Monthly Income, Performance Rating) practices have in clarifying negative attrition. The goal of the study is to recognize the causes of negative attrition based on objective data analysis. By doing so, the predictive model helps in identifying the causes of negative attrition and also in predicting which employee will leave the company. After training 70% of the IBM dataset, results are

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given using three accuracy standards — classification accuracy, precision, and recall. The predictive model that produced the best results for the remaining 30% of the test dataset is the neural networks model. It reveals the best classification accuracy (0.839), precision (0.824), and recall (0.839).

Keywords: *neural network, confusion matrix, negative employee attrition, CRISP-DM framework, predictive models.*

JEL Classification: I20, M12, M10.

1. INTRODUCTION

Employee attrition affects both top and bottom performance. There are two sides to employee attrition: positive and negative (Flowers & Hughes, 1973). When low-performing employees leave the organization, this is referred to as positive attrition. In contrast, negative attrition happens when top-performing employees become demotivated and exit (Samuel & Chipunza, 2009). Negative attrition is a grave problem and, if not handled well, results in more significant employee turnover (Davidescu et al., 2020; Yedida et al., 2018).

Companies are adopting several strategies to ease negative attrition, such as employee referrals (Khalid & Nawab, 2018), financial support for higher education (Johnson & Gueuta, 2019; Towns, 2019), flexible working hours (Golden, 2003), and allowing employees to work from home (Bloom, 2014). Companies, however, find it difficult to limit negative attrition even with a well-balanced combination of these measures.

This work aims to analyze how objective factors cause negative attrition and recognize the notable causes of an employee's decision to leave a company. After training 70% of the dataset, the obtained model tests the remaining 30% for predicting employees' negative attrition. For the prediction models that provided the best outcomes, the conclusions are expressed in terms of accuracy standards. In companies where employees perform particular tasks, employee continuity becomes essential; thus, the role of predictive models to identify negative attrition becomes an indispensable constituent (Khera & Divya, 2019). Furthermore, predictive models allow companies to transform data into meaningful information by using historical data to predict the causes of negative attrition (Jhaver et al., 2019; Ray & Sanyal, 2019).

We investigate the causes of negative attrition by identifying the variables that influence them and then present the best-predicted model based on a statistical analysis of the data. First, the study uses selected prediction models to assess the data with 24 characteristics

(after deleting 11 inactive variables). The findings are then represented in three accuracy criteria using a neural network: classification accuracy, precision, and recall. The research findings show that a predictive model may be used to identify negative attrition and its causes.

The remainder of the paper is laid out as follows: The research approach is presented in Section 2, which includes business knowledge, data understanding, and data preparation for analysis. Section 3 is devoted to data modeling, and it depicts the model creation phase as well as a predictive model that has been implemented. In Section 4, we give the analysis findings, assessing the offered models' accuracy requirements. In section 5, the conclusion rollout is discussed, which offers the result based on the neural network for 30% of the test data. Finally, the findings are given in Section 6.

2. METHODOLOGY

The approach used in this study is based on the CRISP-DM framework, which stands for Cross-Industry Standard Process for Data Mining, and data analytic methodologies. CRISP-DM framework comprises a process model for devising, creating, building, testing, and deploying predictive models (Rodrigues, 2020).

The CRISP-DM approach is applied to select the best predictive model for identifying negative attrition with the following phases:

1. *Business understanding:* Understand the research objectives. (Section 2.1)

2. *Data understanding:* Acquire the employee dataset, which includes previous and present employee insights. Identify inactive variables and perform descriptive analysis to ascertain that the distribution of data for the dependent variable is part of the data comprehension process. (Section 2.2)

3. *Data preparation for predictive modeling:* To prepare the final dataset; data preparation entails data cleansing. (Section 2.3)

4. *Data modeling:* Data modeling elaborates the dataset for training and testing to be used by predictive models for analysis. (Section 3)

5. *Results evaluation:* Evaluate the results based on different performance metrics and select the best-fit model that gives the most accurate results for the given problem. (Section 4)

6. *Outcome deployment:* Use the best-fit model for predicting the negative attrition and identify the reasons why employees leave their jobs. (Section 5)

2.1 Business Understanding

This study aims to pinpoint the case's business understanding. Following are the two research goals:

i. Negative attrition may be predicted using predictive models based on corporate data, workforce characteristics, and employee benefits.

ii. The predicted accuracy of various predictive models may be used to assess their efficacy.

2.2 Data Understanding

The dataset used in this study has been made available by IBM. There are 35 characteristics in this dataset, which correspond to 1470 instances.

2.2.1 Identifying Dormant Variables

It was observed from the dataset that some variables played a minor role; these were termed as dormant variables, and are not required for the prediction of negative attrition. Thus, the number of variables were reduced from 35 features to 24 features (see Table 2).

Table 1 shows lists of independent and dependent variables.

Table 1: Dataset

Independent Variables			Dependent Variable
Company Characteristics	**Workforce Characteristics**	**Employee Benefits**	
BusinessTravel, DailyRate, Department	EnvironmentSatisfaction, JobInvolvement, JobLevel JobRole, JobSatisfaction, RelationshipSatisfaction	StockOptionLevel, TrainingTimesLastYear, WorkLifeBalance, PercentSalaryHike, MonthlyIncome, PerformanceRating	Attrition
Other variables: Age, DistanceFromHome, Education, EducationField, Gender, MaritalStatus			

Table 2: Dormant variables

EmployeeCount
EmployeeNumber
MonthlyRate
NumCompaniesWorked
Over18
StandardHours
TotalWorkingYears
YearsAtCompany
YearsInCurrentRole
YearsSinceLastPromotion
YearsWithCurrManager

Attrition, the dependent variable, specifies 'No' when an employee did not exit the company and 'Yes' when an employee did depart. The variables Age, DistanceFromHome, Education, EducationField, Gender, and MaritalStatus are categorized as general variables (see Figure 1).

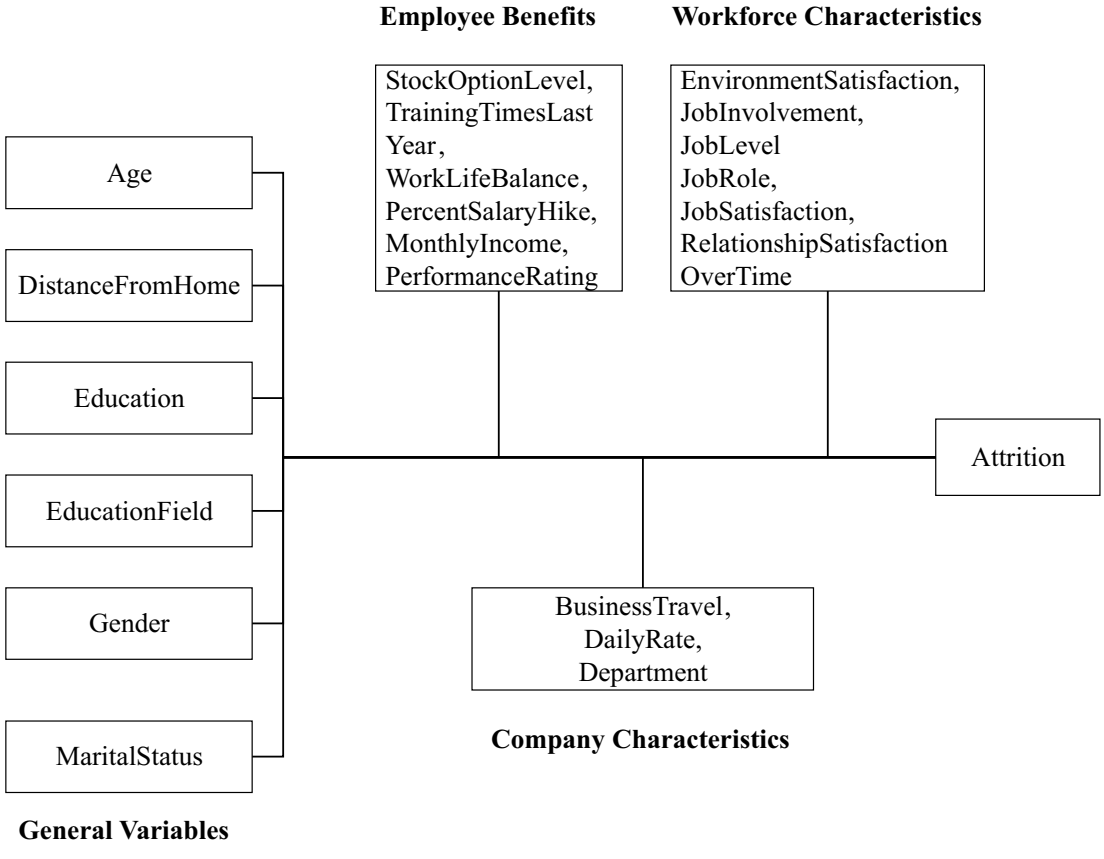
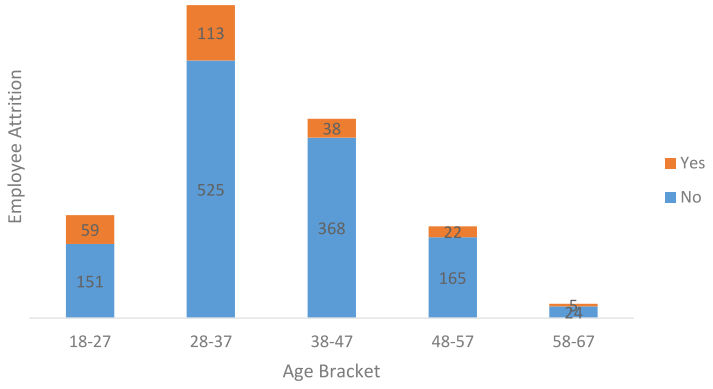


Figure : Variables for recognizing negative attrition

2.2.1 Descriptive analysis for general variables

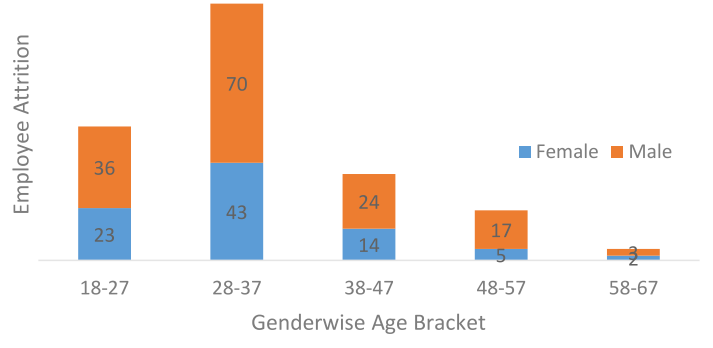
Descriptive analysis assists in the assessment of the target variable's prevalence throughout the dataset. As shown in Figure 2, 28% of employees in the age bracket of 18–27 left their jobs. The number decreases as we progress through age.



18-27	28%
28-37	18%
38-47	9%
48-57	12%
58-67	17%

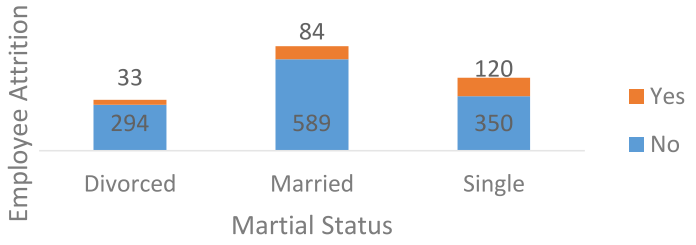
Figure 2: Distribution of negative attrition by age bracket

Interestingly, gender-wise, negative attrition is higher in the age bracket of 28–37 for females and males with 49% and 47%, respectively. Overall, 15% and 17% females and males respectively left their jobs. As shown in Figure 3, the effect of negative attrition drops in both genders as the age progresses.



Gender	Age Bracket				
	18-27	**28-37**	**38-47**	**48-57**	**58-67**
Female	23	43	14	5	2
Male	36	70	24	17	3

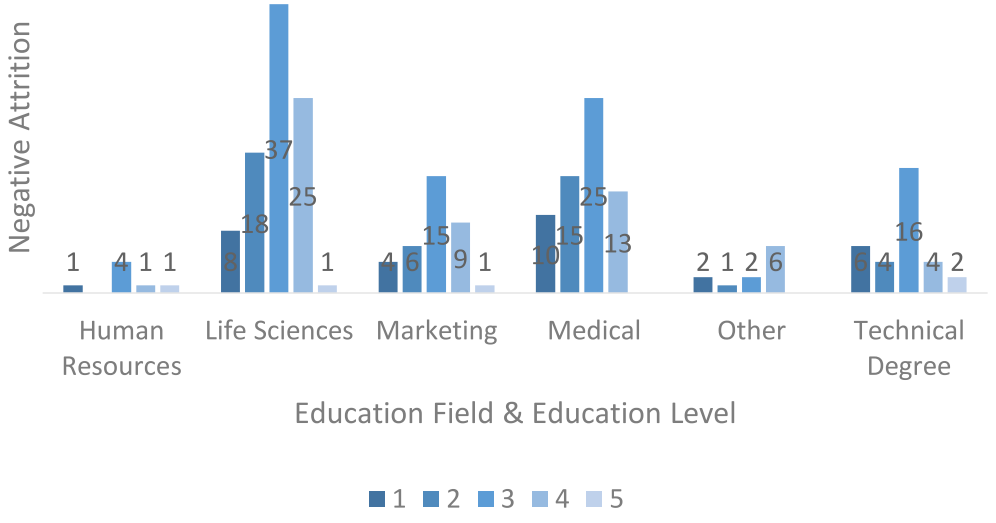
Figure 3: Distribution of negative attrition gender and age wise



Divorced	10%
Married	12%
Single	26%

Figure 4: Distribution of negative attrition by marital status

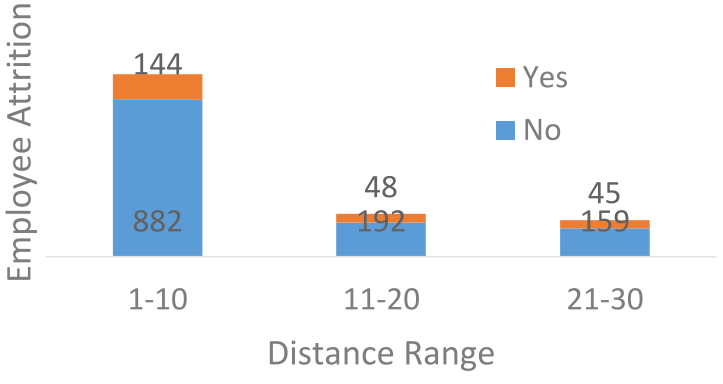
In Figure 5, we reported negative attrition as a function of the education field and education level. The dataset has six education fields, namely, Human Resources, Life Sciences, Marketing, Medicine, Technical Degree, and Others. The education level for each education field is divided into five groups, with 1 specifying basic qualification and 5 denoting the highest qualification. Employees with a specialization in Human Resources and Technical Degrees are the biggest contributors to negative attrition, with 26% and 24%, respectively. Employees with education in Life Sciences and Medicine possess a negative attrition rate of 15% and 14%, respectively. It can also be seen in Figure 5 that employees with education levels 1, 2, 3, and 4 are the highest contributors to negative attrition at 18%, 16%, 17%, and 15% rates of attrition, respectively. Employees with the highest education level 5 only contribute to 10% of negative attrition.



Education Level → / Education Field ↓	1	2	3	4	5
Human Resources	1	0	4	1	1
Life Sciences	8	18	37	25	1
Marketing	4	6	15	9	1
Medical	10	15	25	13	0
Other	2	1	2	6	0
Technical Degree	6	4	16	4	2

Figure 5: Distribution of Education Field and Education Level

Figure 6 shows that when the distance between home and work grows, employees leave the company in greater numbers. The percentages of negative attrition within the cluster vary greatly, as seen in Figure 6,i.e., between 14% and 22%. Employees who live far from the company's headquarters, on the other hand, are known to abandon their jobs.

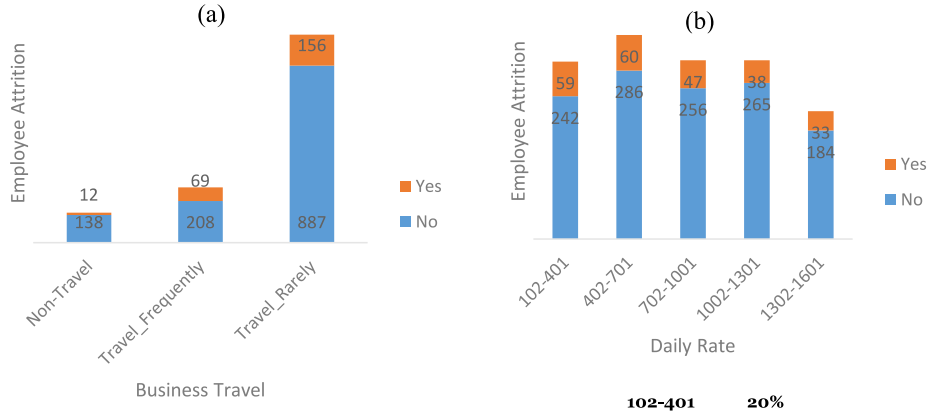


1-10	14%
11-20	20%
21-30	22%

Figure 6: Distribution of negative attrition by distance from home

2.2.2 Descriptive analysis for company characteristics

We have shown negative attrition as a factor of company attributes in Figure 7. For business travel, the highest effect of negative attrition is for employees who frequently travel, at 25%. Figure 7(a) shows that the percentages of negative attrition for employees who do not travel or rarely travel are 8% and 15%, respectively. Figure 7(b) shows that for a daily rate, 20% of employees with the lowest daily rate in the range of 102–401 tend to leave the job frequently. Employees with other daily rates (402–701, 702–1001, 1002–1301, and 1302–1601) demonstrate a negative attrition rate of 13% to 17%. Finally, Figure 7(c) shows that the impact of negative attrition on Human Resource department employees, Research & Development employees, and Sales employees are 19%, 14%, and 21%, respectively.



Non-Travel	8%
Travel_Frequently	25%
Travel Rarely	15%

102-401	20%
402-701	17%
702-1001	16%
1002-1301	13%
1302-1601	15%

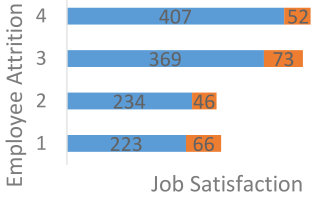
Human Resources	19%
Research & Development	14%
Sales	21%

Figure 7: Distribution of negative attrition for company characteristics: (a)Business Travel (b)Daily Rate and (c)Departments

2.2.3 Descriptive analysis for workforce characteristics

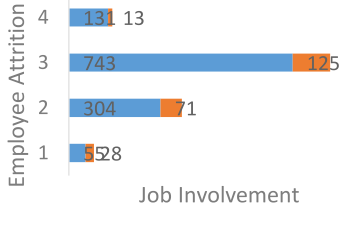
The dispersion of workforce characteristics under negative attrition is seen in Figure 8. Concerning job satisfaction, an employee with job satisfaction 1 (1 being lowest and 4 the highest) is 23%. Employees with job satisfaction 2, 3, and 4 are 16%, 17%, and 11% respectively (Figure 8(a)). The findings indicate that the employee's job involvement in the company's operations is the most significant factor in deciding attrition. It is noticed that 34% of employees with low job involvement chose to leave the organisation (Figure 8(b)). It is also observed that one-fourth (25%) of the employees leave because of low environmental satisfaction (Figure 8(c)). Employees with job level 1 (1 being the lowest and 5 the highest) have the highest negative attrition rate of 26% (Figure 8(d)). For dissatisfaction with the job role, 40% of sales representatives leave their job, 23% human resources personnel leave their job, and 24% laboratory technicians leave their job (Figure 8(e)). Relationship satisfaction shows the relationship of employees with other employees and its effect on negative attrition. It is observed that an employee with low relationship satisfaction tends to leave the company with a 21% rate of negative attrition (Figure 8(f)). It is also witnessed that almost one-third of employees who work overtime, tend to leave the organisation resulting in a 31% rate of negative attrition (Figure 8(g)).

(a)



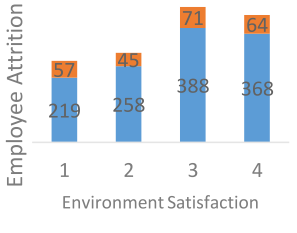
1	23%
2	16%
3	17%
4	11%

(b)



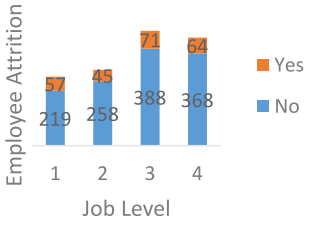
1	34%
2	19%
3	14%
4	9%

(c)



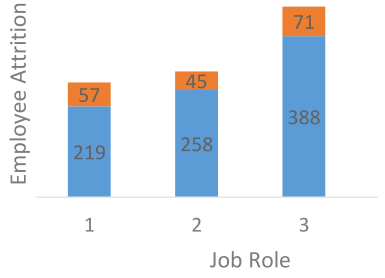
1	25%
2	15%
3	14%
4	13%

(d)



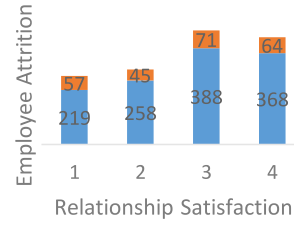
1	26%
2	10%
3	15%
4	5%
5	7%

(e)



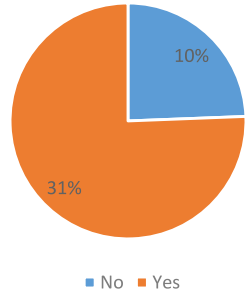
Healthcare Representative	7%	Research Director	3%
Human Resources	23%	Research Scientist	16%
Laboratory Technician	24%	Sales Executive	17%
Manager	5%	Sales Representative	40%
Manufacturing Director	7%		

(f)



1	21%
2	15%
3	15%
4	15%

(g)



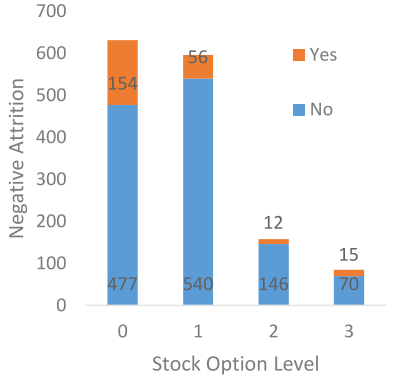
Overtime	
No	10%
Yes	31%

Figure 8: Distribution of negative attrition for workforce characteristics: (a) Job Satisfaction, (b) Job Involvement, (c) Employee Satisfaction, (d) Job Level, (e) Job Role, (f) Relationship Satisfaction, and (g) Overtime

2.2.4 Descriptive analysis for employee characteristics

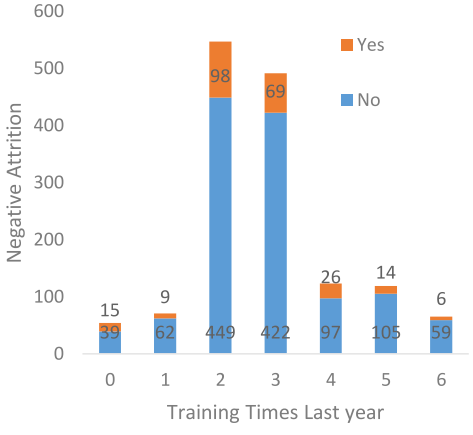
Figure 9 represents the variation in negative attrition depending on various job characteristics. Nearly one-fourth of employees with 0 stock options leave the job in comparison to employees with high stock options (1, 2, and 3) (Figure 9(a)). Employees with low training demonstrate higher negative attrition (28% employees with 0 training left the job) compared to employees with more training. The negative attrition is lowest (9%) with six training (Figure 9(b)). Individuals who have left the company and those who are still working are equally represented in the attrition rate (Figure 9(c)). Attrition is above 30% among individuals with a poor work-life balance, whereas employees who didn't seem to work overtime have an attrition rate of 14% to 18%. The 1% increase is divided into three categories, each of which is grouped by 5. The negative attrition percent salary hike is equally distributed between the groups (Figure 9(d)). The monthly income is divided into 4 clusters with four groups, each separated by 5000. Employees with low monthly incomes between 1000–6000 demonstrated the highest negative attrition of 20% (Figure 9(e)). Though the performance rating ranged from 1 to 5, 1 being the lowest and 5 the highest, the employees rated 3 and 4 respectively. The negative attrition for performance ratings 3 and 4 is equally divided by 16% (Figure 9(f)).

(a)



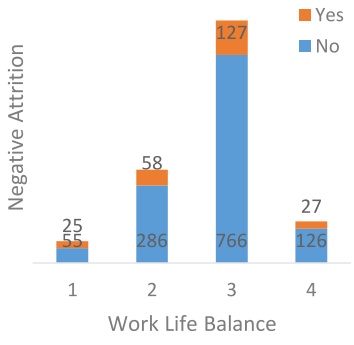
0	24%
1	9%
2	8%
3	18%

(b)



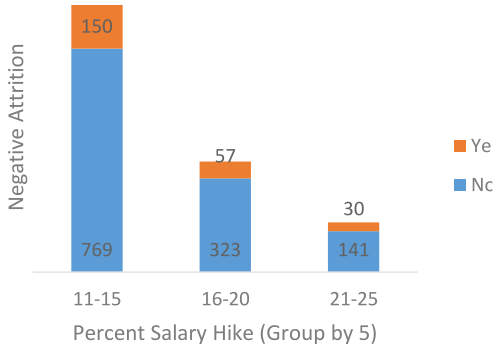
0	28%
1	13%
2	18%
3	14%
4	21%
5	12%
6	9%

(c)



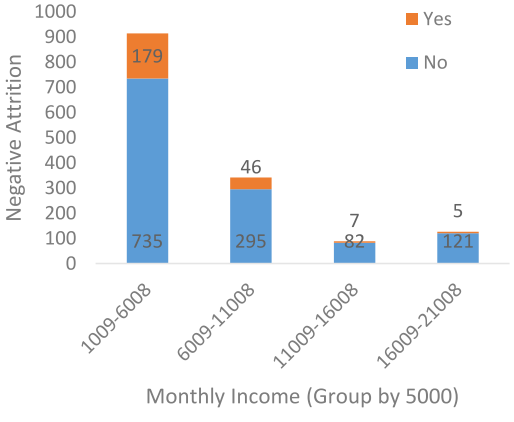
1	31%
2	17%
3	14%
4	18%

(d)



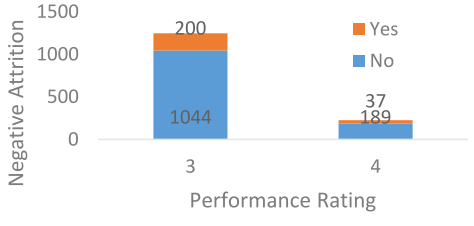
11-15	16%
16-20	15%
21-25	18%

(e)



1009-6008	20%
6009-11008	13%
11009-16008	8%
16009-21008	4%

(f)



3	16%
4	16%

Figure 9: Distribution of negative attrition for employee characteristics: (a) Stock Options Level (b)Training Times Last Year (c) Work-Life Balance (d) Percent Salary Hike (Grouped by 5) (e) Monthly Income (Grouped by 5000) and (f) Performance Rating

2.3 Data preparation for predictive modeling

One of the most essential aspects of predictive modeling is data preparation. Data preparation for the study was conducted in two parts — removing dormant variables, and mapping textual values to numeric values.

The original dataset contained several variables with textual values that needed to be transformed into numeric values for in-depth analysis. Also, we needed to outline the range for the numeric values for classification (see Table 2).

Table 3: Variables transformation

Variable Name	**Variable type**	**Transformation**
BusinessTravel	Text	Text to Numeric Value Non-Travel to 0, Travel_Rarely to 1, Travel_frequently to 2
DailyRate	Numeric	Numeric to Range, Grouped by 300, Starting at 102, Ending at 1601 [102–401, 402 –701, 702 –1001, 1002 –1301, 1302 – 1601]
Department	Text	Text to Numeric Human Resource to 1, Research & Development to 2, Sales to 3
MonthlyIncome	Numeric	Numeric to Range, Group by 3000, Star ting at 1009, Ending at 22008 [1009–4008, 4009 –7008,7009–10008, 10009– 13008, 13009–1008, 16009–19008, 19009–22008]
PercentSalaryHike	Numeric	Numeric to Range, Group by 5, Starting at 11, Ending at 25 [11–15, 16–20, 21–25]
JobRole	Text	Text to Numeric value Healthcare Representative to 1, Human Resource to 2, Laboratory Technician to 3, Manager to 4, Manufacturing Director to 5, Research Director to 6, Research Scientist to 7, Sales Executive to 8, Sales Representative to 9

3. DATA MODELLING

The data modeling method includes choosing prediction models based on the experimentation's multiple machine learning approaches. Predictive models such as the Support Vector Machine (SVM), Random Forest, Naive Bayes, and Neural Network were all employed. The goal was to find the best classifier for the situation at hand. As a result, each classifier had to be trained on the featured set, with the strongest classifier being used for prediction.

Four separate accuracy standards from the confusion matrix have been used to evaluate the classifier:

1) The employee did not leave the job, and the predictive algorithm predicted it correctly (Actual →0, Predicted →0, termed as True Negative (TN))

2) The employee did not leave the job, and the predictive algorithm wrongly predicted that the employee left the job (Actual →0, Predicted →1, termed as False Positive (FP))

3) The employee left the job, and the predictive algorithm predicted it correctly (Actual →1, Predicted →0, termed as True Positive (TN))

4) The employee left the job, and the predictive algorithm wrongly predicted that the employee did not leave the job (Actual → 1, Predicted → 1, termed as True Negative (FN))

The accuracy standards from the confusion matrix are classification accuracy, precision, and recall (see Table 4)

Table 4: Accuracy standard to evaluate predictive models

Accuracy Standard	Evaluation Criteria
Classification Accuracy: This is the number of correct predictions divided by the total number of data points. $$Classification\ Accuracy = \frac{TP + TN}{TP + TN + FP + FN}$$	$Classification\ Accuracy > 0.5$
Precision: This is the fraction of True Positives (TP) to all positives is known as precision. $$Precision = \frac{TP}{TP + FP}$$	$Precision > 0.5$
Recall: Our model's ability to properly detect True Positives (TP) is measured by Recall (TP). $$Recall = \frac{TP}{TP + FN}$$	$Recall > 0.5$

Due to the absence of two distinct datasets, the dataset was divided into two portions with 70:30 ratios, with 70% used for training and 30% used for testing (see Figure 2).

70% of the dataset, totaling 1029 observations, were used to train all of the prediction models. The remaining 30% (441 observations) were used in the test set to assess the classifiers' overall performance using a confusion matrix.

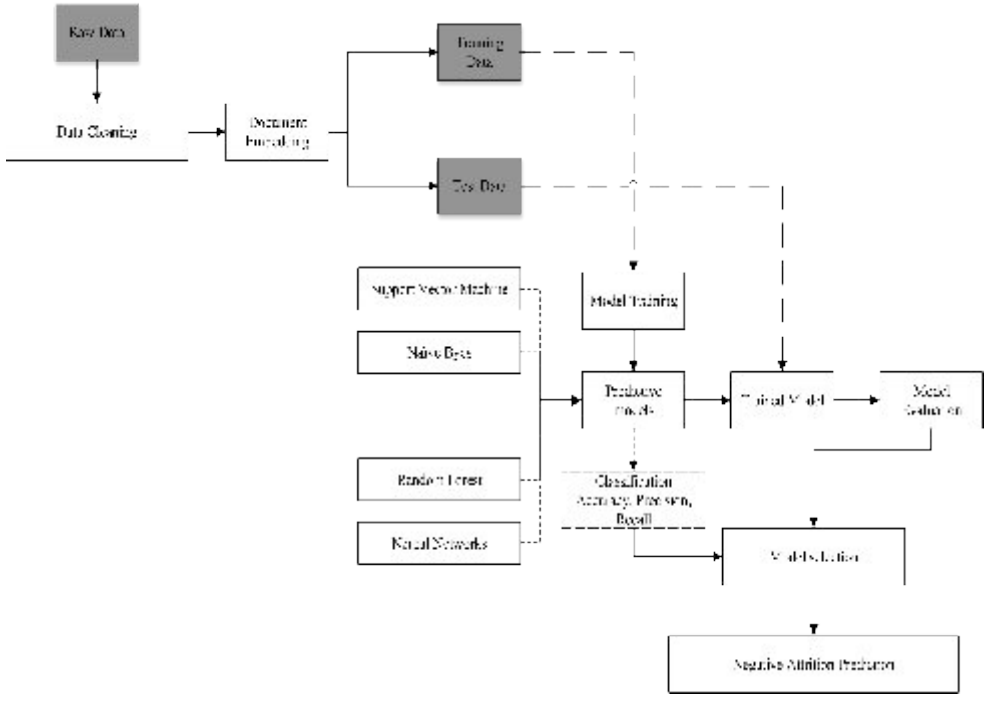


Figure 2: Negative attrition predictive model (train and test data)

4. RESULTS EVALUATION

This step assessed the correctness of the models used. For each of the prediction models, the outcomes of the decisions made during the data modeling phase were gathered. The findings were analyzed with the use of a confusion matrix, which displayed the values for each of the proposed prediction models.

We created a set of essential metrics that objectively reflected the competency of each model for performance evaluation: classification accuracy, precision, and recall. The results are summarized in Table 5.

Table 5: Performance metrics of proposed predictive models

Predictive models	Classification accuracy	Precision	Recall
SVM	0.911	0.908	0.911
Random Forest	0.965	0.966	0.965
Neural Network	1.000	1.000	1.000
NaiveBayes	0.812	0.841	0.803

We were concerned with reducing the amount of false negatives when projecting the number of employees who could leave the organization.

5. OUTCOMES DEPLOYMENT

As shown in Table 5, the neural network was determined to be the best predictive model for achieving the study goals. The confusion matrix of the neural network prediction model was examined in Table 6. 370 out of 441 occurrences were correctly categorised by the Neural Network prediction model.

Table 6: Neural Network predictive model outcomes for test data

Neural Network	Classification accuracy	Precision	Recall
	0.839	0.824	0.839

The neural network got the following results:

- The lowest percentage of false positives was 7.3%. It only missed 27 employees who had left the organization, earning a recall score of 0.839.
- The true positive rate was around 38.03%, accurately foreseeing 27 out of 71 individuals who had left the company.

The neural network model also identified the top-ranked variables, which means they contribute the most to the dependent variable. So, as we are trying to find why an employee leaves the job, we keep the value of the dependent variable attrition=yes (see Table 7).

Table 7: Why employees leave their job

Variables (attrition=yes)	Likely to leave
JobRole=Research Director	9%
Department=Human Resources	11%
EducationField=Other	11%
MaritalStatus=Single	15%
TrainingTimesLastYear	16%
Education	17%
OverTime=No	17%
WorkLifeBalance	25%
OverTime=Yes	32%

The highest-ranked variable is OverTime (with 32% and 17%, respectively), indicating the maximum impact on the negative attrition prediction. The variable WorkLifeBalance also has a high effect on negative attrition with 25%. Education and TrainingTimesLastYear also play a substantial role in negative attrition.

CONCLUSION

The study attempted to identify reasons why an individual might leave their job:

1. What factors suggest that an individual is likely to leave the company?

2. What is the best predictive model for detecting negative attrition?

3. What are the reasons behind unfavorable attrition in an organization, workforce, and what are the offered employee benefits?

To do this, we used four prediction models to determine the elements that may influence an individual's decision to leave the organisation. We started with a descriptive study to see how independent factors affected the dependent variable, attrition. Then, a descriptive study for three categories of moderating variables, company characteristics, workforce characteristics, and employee benefits, was conducted to identify their impact on attrition.

The dataset was separated into training and test groups, ensuring that the target variable had a comparable dispersion. We selected various predictive models (SVM, Random Forest, Neural Network and NaiveBayes), and for each of them, we conceded out the training and validation phases. The projected outcomes were gathered and fed into the confusion matrices to analyze the performance. From these, the fundamental metrics required for an overall assessment (classification accuracy, precision, and recall) could be calculated, and the best-suited predictive model to determine if an individual was likely to quit the organization could be identified. The neural network prediction model demonstrated the best recall rate (0.839) and an aggregate false negative rate of 7.3% observations for the given dataset. Results obtained by the proposed predictive models demonstrate that the main negative attrition variables are JobRole=Research Director, Department=Human Resources, EducationField=Other, MaritalStatus=Single, TrainingTimesLastYear, Education, OverTime=No, WorkLifeBalance, and OverTime=Yes.

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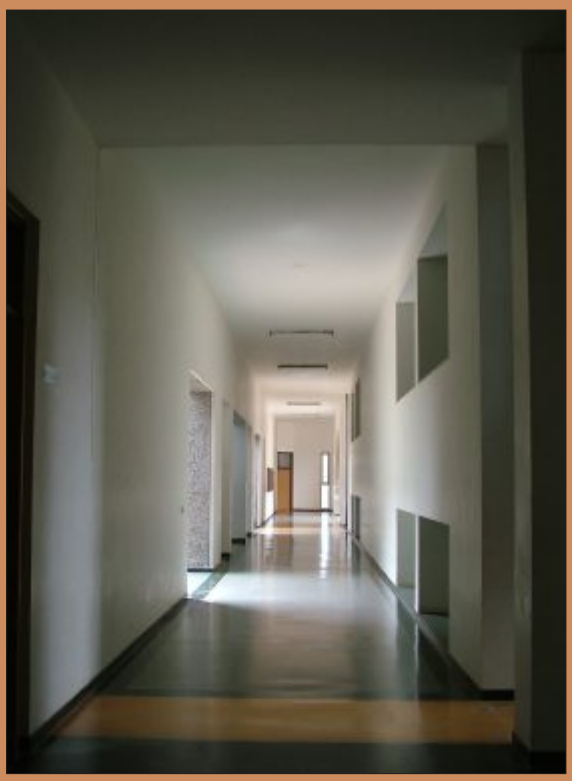

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