

HR Analytics as a Tool for Performance Appraisal: A Systematic Review of Literature

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Abstract:

The objective of the research paper is to study the use of HR Analytics in various fields, specifically to analyse the performance appraisal of employees through HR Analytics. It is one of the upcoming domains of study that has already proved to be very useful for business organizations in particular. Although analytical tools are being used by some universities, the usage is still at a very nascent stage. In this study, it has been observed that analytical tools are not widely used in secondary schools. Hence, it would be intriguing to understand the impact of analytics-based performance appraisal in schools. Therefore, from the ease of accessibility point of view, this study focused on the influence of performance appraisal on CBSE school teachers.

The motivation behind the study is a fascination to see how the use of HR Analytics can be helpful in the teaching-learning process of secondary schools. Although there are some literatures available that have studied the impact of teacher evaluation and improvement of teaching quality, the extent to which it results in the growth and development of students is crucial. That matters. The study tries to find out how performance assessment helps the students to receive quality teaching and improved methods of teaching by their teachers. It shows that there is a strong and positive relationship between TPA and teachers' motivation.

Key words: HR Analytics, Performance Appraisal, quality teaching, CBSE School, Professional development.

Introduction: The accountability of a teacher aids administrators and educators in taking appropriate actions to student success. Trust-building among administrators and co-workers, as well as the professional growth of teachers, are all significantly influenced by teacher evaluation. [1] Through the study of primary and secondary data, followed by thorough analysis, it is found that effective teacher evaluation and feedback are essential for improving teaching quality and fostering teachers' enhance their relationship and boost professional development in CBSE schools. While some literature has explored the impact of teacher evaluation on the

improvement of teaching quality, the crucial question remains: to what extent does it contribute to the growth and development of students? That is what truly matters.

HR analytics can be a valuable tool for the performance appraisal of CBSE teachers. By leveraging data and analytics, HR professionals can gain insights into the performance of teachers and make informed decisions. Here are some ways HR analytics can be applied to performance appraisal: data collection, key performance indicators (KPIs), data analysis, performance dashboards, comparative analysis, predictive analytics, feedback, and improvement, etc [2]

Research Questions and Objectives: To give a direction to the study, following research questions were formulated under this conceptual study on HR analytics.

1. What is HR analytics?
2. What is its importance?
3. What is the process of HR analytics?
4. What are the possible HR questions that can be answered by HR analytics?
5. What are the challenges that exist for HR analytics?

This paper aims to find answers for the above mentioned research questions in the context of HR Analytics specifically in the education domain and to introduce a new model on HR analytics.

1. "Weena Yancey Momin (2015) et al., in their work on HR analytics titled "Transforming Human Resource Management," discussed that the alignment of HR strategy with the entire business plan is greatly aided by HR analytics. HR managers are assisted by HR analytics in developing plans that provide their company with an edge over rivals. The study examines whether HR analytics is altering the HR division and HR managers' roles. It investigates how HR Analytics helps an organization's workforce perform better, thereby boosting employee productivity and revenue creation. With the advent of new technologies like HR analytics, HR issues such as succession planning, hiring, manpower planning, and anticipating turnover can now all be addressed.[3]

2. Paleti Narendar (2015), in their paper titled "Analyzing the Impact of HR Analytics on Organizational Performance of the IT Industry – A Mixed Methodology Approach," mentioned that integrating HR Analytics is substantial. However, additional Artificial Intelligence practices need to be adopted across all HR functions. HR Analytics significantly affects how well an organization performs. In order to assess the effectiveness of policies for successful implementation, a survey of IT personnel in the Indian setting was primarily conducted. It is clear from the study that artificial intelligence

practices are rarely used, and HR Analytics is not used to track employee backgrounds, identify attrition causes, and encourage employee participation. HR Analytics helps organizations perform better because the successful implementation of these HR practices has a greater impact on the organization as a whole." [4]

3. **Shilpy Verma et al (2017) in Research Paper on Role of Analytics in Renovating Human Resource Management** "In their 2017 research paper on the Role of Analytics in Renovating Human Resource Management, Shilpy Verma et al argue that in order to provide the finest information for management, HR must incorporate the newest technology and refresh its pace of modernization. The core of human resource management, which serves as the foundation for strategic levels, is the analysis of large-scale employee records. By designing strategic human resource plans, HR can establish a strong strategic business partnership with the organization, resulting in two important outcomes: enhanced organizational efficiency and a highly satisfied workforce. HR Analytics offers benefits across reactive, proactive, strategic, and predictive decision-making. [5]

4. "Mrs. Parul Manchanda and Shruti Gulati (2018) explore the significance of human resource analytics in managing an organization's workforce in their paper 'HR Analytics at Work: Making More Powered Organizations.' Their focus extends to understanding its impact on organizational outcomes. The study identifies fundamental factors contributing to the rise of workforce analytics, revealing a positive influence on workplace dynamics. However, the adoption of HR analytics is not universal among all business organizations, as employees may exhibit varying levels of adaptability. Human capital analytics empowers organizations to optimize resource allocation by identifying high-performing individuals. Successful implementation requires companies to have the right team of employees for accurate data collection, appropriate statistical analysis, and effective communication of meaningful results in an accessible manner." [6]

5. "A. Jagan et al. (2018) in their research paper titled "Technology for Sustainable HRM: An Empirical Research of Health Care Sector' assert that understanding and appreciating employee behavior is essential in the current competitive world. This understanding enables organizations to take necessary steps to extract the best performance from their invaluable human resources. In this context, technological advancements such as Artificial Intelligence (AI) and HR Analytics (HRA) play a crucial role in gaining insightful knowledge about human behavior. The use of these technologies not only facilitates efficient decision-making but also

contributes to the achievement of organizational objectives. Additionally, HRA and AI applications aid in integrating human resources with other corporate operations, further enhancing overall efficiency."[7]

6. "A. Jagan et al. (2018) in their research paper titled 'Technology for Sustainable HRM: An Empirical Research of the Health Care Sector' assert that understanding and appreciating employee behavior is essential in the current competitive world. This understanding enables organizations to take necessary steps to extract the best performance from their invaluable human resources. In this context, technological advancements such as Artificial Intelligence (AI) and HR Analytics (HRA) play a crucial role in gaining insightful knowledge about human behavior. The use of these technologies not only facilitates efficient decision-making but also contributes to the achievement of organizational objectives. Additionally, HRA and AI applications aid in integrating human resources with other corporate operations, further enhancing overall efficiency."[8]

7. "Dr. Abdul Quddus Mohammed (June 2019) in 'HR ANALYTICS: A Modern Tool In Hr For Predictive Decision-Making' emphasizes that human resources management should focus on gaining a deeper understanding of the behavioral peculiarities and characteristics of its employees to be effectively proactive and facilitate changes that yield favorable results or have profitable implications. To comprehend the relationship between analytics and human resources and its role in advancing the current field of managerial and HR-related research, the study delves into the existing literature. The goal of the research is to better understand the potential of HR analytics in supporting managers to make predictive decisions based on statistical evidence and relevant HR analytical data and literature."[9]

8. H.H.D.P.J. Opatha (2020), in his paper titled 'HR Analytics: A Literature Review and New Conceptual Model,' focuses on the importance of improving employee performance. HR analytics plays a vital role in enhancing the return on investment (ROI) of human resources. It provides an opportunity to assess how employees contribute to the organization, forecast workforce requirements, and determine the most effective ways to fill vacant positions. HR analytics charts a course towards enhancing business performance, optimizing workforce utilization, and achieving financial goals. Essential skills for any HR professional intending to implement HR analytics include business understanding, data gathering and mining skills, analytical skills, and effective communication and presentation skills. Moreover, the researcher concludes that HR analytics offers a data-driven framework for addressing workforce challenges. Analyzing data through a combination of software and methodologies

enables enterprise leaders to optimize human resource management and enhance the strategic value of HRM. [10]

9. "Nanta Sooraksa, in his paper titled 'A Survey of Using Computational Intelligence (CI) and Artificial Intelligence (AI) in Human Resource (HR) Analytics' (2021), demonstrates the significant benefits HR Analytics can derive from Computational Intelligence (CI) and Artificial Intelligence (AI). This paper serves as a survey of these tools and their applications in HR, encompassing recruitment, retention, reward, and retirement. The researcher particularly emphasizes the impact of Industrial 4.0 (The Fourth Industrial Revolution) on HR and its various functions. HR analytics extends to training trainers using CI and AI as supporting engines. Establishing successful implementation involves enhancing career development and training for up skilling and development through private-public partnerships.[11]

10. Meenal Arora et al., in their paper titled 'HR Analytics and Artificial Intelligence - Transforming Human Resource Management' (December 2021), highlight that advancements in artificial intelligence (AI) have instigated rapid changes in the business environment. The integration of AI into human resources enables the analysis, prediction, and diagnosis of organizational challenges, facilitating better decision-making in employee-related matters. The authors argue that HRM has undergone a drastic transformation, shifting from administrative functionality to more advanced processes, such as automation through the application of artificial intelligence. This transformation has entirely redefined and reshaped the attributes of the organizational workforce. Through the deployment of AI and analytics in HR functions like talent acquisition, training and development, employee retention, engagement, and performance appraisal, organizations can enhance proficiency and productivity. The primary challenge for HR departments lies in how thoroughly they can enhance employee skills and renovate their teams in the field of HR Analytics and AI. The current research evaluates the functional analysis of artificial intelligence in the human resource context.[12]

Inferences:

1. The review of the above-mentioned literature points out certain key inferences as mentioned below:

- Boosts employee productivity, ROI, and enhances revenue creation.
- HR functionalities such as succession planning, recruitment, manpower planning, turnover prediction, and skill shortage identification can be performed more precisely and quantifiably.

- Aids in strategic decision-making by supporting reactive, proactive, and predictive decisions.
- Increases efficiency with the incorporation of AI and Computational Intelligence tools, integrating AI-based HR with corporate functions.
- HR analytics facilitates the transition of HR from transactional roles to more transformational roles, leveraging employee competencies.
- Many Fortune 500 companies rely on HR Analytics to optimize the usage of their human capital through improved large-scale data governance.
- Emphasizes the importance of efficiently mining HR data using technology for quantifiable decision-making, positioning it as a predictive engine.
- Encourages the shift from simple Excel and dash boarding techniques to AI-enabled HR practices.
- HR tools and applications assist in recruitment, retention, reward, and retirement functions.
- HR Analytics is employed to bridge skill gaps and enhance the competencies of employees.

Performance Appraisal

1. "K. D. V. Prasad et al. (2007) in 'Teacher's Performance as a Function of Occupational Stress and Coping with Reference to CBSE Affiliated School Teachers in and around Hyderabad' discuss the evolving nature of work stress. They emphasize the need for school administrations to address occupational stress dynamically by adopting coping mechanisms, revamping the work structure, and modifying the school environment. Flexibility in applying school ethics and policies is crucial. For teachers to perform as professionals, clear role definitions, job descriptions, and productivity standards are essential to eliminate doubts about their duties and roles during evaluations. The teaching profession is currently facing challenges in attracting qualified candidates. India's poor teacher quality presents a catch-22 situation: attracting top talent is impossible without restoring the profession's dignity, and achieving this is impossible without making teaching a viable career option. Factors such as low pay, long hours, limited prospects for advancement, and a lack of a streamlined system for incentives, rewards, and recognition contribute to this challenging cycle.[13]

2. Martha Zaslow et al. (2010) in their paper, 'Toward the Identification of Features of Effective Professional Development for Early Childhood Educators,' highlight that research in early childhood professional development is still in its early stages. A significant portion of academic research consists of descriptive and correlational studies, with fewer carefully planned and conducted experimental trials. Assessments, when conducted, have primarily focused on curriculum implementation rather

than the training of early childhood educators to apply them. Numerous unanswered questions persist regarding the most effective components of professional development for early childhood educators, both individually and as comprehensive 'packages,' to enhance educator and child outcomes." [14]

3. "Dr. Purna Prabhakar Nandamuri (August 2012), in 'An Appraisal of the Teacher Appraisal System,' reveals that formal appraisal activities are not conducted in public sector schools, while most private unaided managements conduct their own appraisals. The choice of an integrated teacher appraisal system is strongly correlated with the type of school. However, in some schools, the performance evaluation method for teachers is not properly applied. Without the crucial first two steps, no formal standards are established, no comparisons are made, and feedback activities become pointless. To assess the quality of education and establish a system for rewards and penalties, a greater proportion of private unaided managements utilize their self-designed teacher appraisal systems. Overall, preferences are roughly distributed equally along the positive and negative axis." [15]

4. Muhammad Imran et al. (2014), in their study titled 'The Performance Appraisal System: An Examination in The City School of Bahawalpur in Terms of Employee Perceptions,' underscores the importance of evaluating the efficiency of the school system for both teachers and students. The researchers aimed to explore significant challenges or obstacles that school teachers face in relation to performance management. The first component of the study assesses the status of the performance appraisal system, with all 44 employee respondents expressing agreement that the system functions well. The conclusion reveals that 28 individuals were impacted by the performance appraisal system in the second part of the analysis, emphasizing the system's effects on employees. Particularly for junior high schools, it is crucial to allocate funds and provide educational personnel with resources and tools to enhance the quality of instruction and the overall school environment. [16]

5. "Sudarshan Mishra et al. (2014), in their research paper titled 'Perception of Teachers, Parents, and Students about Continuous and Comprehensive Evaluation at Elementary School Level in Odisha,' highlight that despite the majority of teachers claiming knowledge about Continuous and Comprehensive Evaluation (CCE), their understanding, as revealed through their responses, is limited. Similarly, CCE remains unknown to parents and members of the community. Notably, teachers often neglect to inform parents about the evaluation findings. The study identifies a lack of qualified

teachers as a primary reason for the incomplete implementation of the CCE plan. To address these challenges, it is recommended that teachers actively organize the evaluation process and maintain a positive attitude toward it. Periodic workshops and in-service training on CCE should be organized for teachers, and there should be ample creation of CCE training modules and educational resources specific to Odisha."[17]

6. Tsediso Michael Makoelle (July 2014), in 'Exploring Effective Teaching Practices for Inclusion: A Case of a South African Secondary School,' asserts that teacher opinions, including their prior political participation in decision-making regarding their practice, and their knowledge about inclusion significantly impact how inclusion is conceptualized in the school setting. The study suggests that foreign inclusion practices might not always be suitable for the South African environment and may need modification to fit local circumstances. The unique setting of southern schools must be considered when conceptualizing inclusion, and the development of local theories on inclusion is deemed inevitable. Additionally, the study highlights that collaboration between teachers and students is less common in South African schools compared to other contexts."[18]

7. Farida Virani (2015) in 'A Performance Evaluation Model for School Teachers: An Indian Perspective' emphasizes the importance of customer satisfaction in education, driven by the value provided by human resources, particularly front-line managers or teachers. The quality of teachers has a high correlation with the value of educational services, as they form the foundation of any educational system. Despite teaching being a noble profession, the need for evaluating teachers based on their performance is acknowledged. Teaching, once an esteemed profession, now struggles to attract quality human resources. To enable teachers to perform as professionals, the author underscores the necessity of providing clear role clarity, job descriptions, and productivity parameters, ensuring no ambiguity about their responsibilities and roles before evaluation. The predicament in India lies in a catch-22 situation: attracting high-quality talent is impossible without restoring dignity to the teaching profession, and doing so is equally impossible without compromising student learning."[19]

8. Endale Berhanu Demissie(2021) in “An Assessment of Teachers’ Performance Appraisal in Secondary Schools of Wolaita Zone, South Ethiopia” According to the analysis, the study found that there were several issues with the performance appraisal process, including a lack of pre- and post-appraisal meetings, insufficient classroom observation for performance appraisal, a lack of school supervisor participation in the process (department heads and unit leaders), a lack of validity and reliability of the

performance appraisal criteria, and a preference for administrative over developmental goals. To make TPA more practical in the secondary schools of Wolaita Zone, the school supervisors (principals, department heads and unit leaders) should carefully plan and provide teachers with the necessary information about the purpose, criteria, methods and procedures of the system to be employed during pre-appraisal meeting. [20]

2. The review of the above-mentioned literature points out certain key inferences as mentioned below:

- Teachers should be provided with clear role definitions, job descriptions, and productivity expectations.
- Emphasize the implementation of the curriculum.
- Performance appraisals are predominantly conducted in private schools.
- Evaluating the efficiency of the school system is crucial for both teachers and students.
- Organize periodic workshops and in-service training for teachers on Continuous and Comprehensive Evaluation (CCE).
- Establish effective communication between teachers and students.
- Effective professional development is the key to school performance.
- Standardize examinations based on psychometric and pedagogical principles.
- A substantial correlation exists between perceived levels of confidence and aspects of the topic.
- The Performance Appraisal (PA) system experiences subjectivity bias as one of the problems.
- An integrated approach to evaluation is the new model for assessing teachers' performance.
- A measuring and explaining personality trait of secondary school teachers is important for clarifying their expectations.

Analytics & Performance Management

1. D. B. Bagul (2014) in 'STUDY OF EMPLOYEE'S PERFORMANCE MANAGEMENT SYSTEM' asserts that performance appraisals serve as a systematic method to ensure that managers and staff regularly engage in discussions about past and current performance concerns, and collaboratively determine a shared vision for the future.

L&T has implemented a robust system performance approach.

The survey results indicate that both appraisee and appraisers have similar expectations from the performance appraisal system, such as 'Determination of Promotion or Transfer' and 'Salary Administration and Benefits.' Consequently, a unified performance appraisal system can satisfy both the appraiser and the appraisee. This approach ensures the creation of a performance evaluation program, allowing the appraiser to periodically

assess the employee's contribution to the organization, recognizing and rewarding those who have been performing well." [21]

2. Kerry Elliott (2015) in *Teacher Performance Appraisal: More about Performance or Development?* Studied that striking the correct balance between evaluating performance and promoting personal growth is the key to effective assessment. The report recognizes the difficulty of evaluating performance appraisal and its effect on teacher effectiveness. Performance evaluation, teacher standards, and professional development are challenging to separate, so it is important to think of them as "part of a wider, more complex web of factors that impact in significant ways upon the work of teachers, and the learning that occurs in schools." Initiatives are frequently accepted in good faith but come off as erroneous and degrading due to political goals and preexisting rhetoric, which limits their effectiveness. [22]

3. "Hritik Kale (2022) et al., in their research paper 'HR Analytics and its Impact on Organizations Performance,' emphasizes the utilization of available data through analytical tools to help organizations identify challenges related to performance, staff retention, turnover, and employee conduct. Addressing questions like 'Why should employees stay with our company?' is crucial, and HR analytics can assist in determining employee needs or deficiencies, enabling the development of systems or programs to enhance performance and retention rates. Companies like Google leverage HR analytics to gather information on employee performance, aiding in identifying optimal training initiatives for both high and low performers. Despite its potential, many organizations overlook HR analytics and other underutilized organizational techniques connected to it. The study focuses on using HR practices to transform traditional organizational roles into transformative ones. [23]

4. "Dr. Anshu Lochab (2018) et al., in their paper on 'Impact of Human Resource Analytics on Organizational Performance: A Review of Literature Using R-Software,' employed an exploratory research design. R software was used for the qualitative analysis of the literature, revealing how frequently HR analytics are utilized to enhance organizational performance. The study explores the recent development in human resource management, HR analytics. To draw meaningful conclusions, a thorough investigation and critical analysis of past literature were necessary. The research aimed to better understand the impact of HR analytics on organizational success, highlighting the current limitations and inconsistencies within the existing literature on HR analytics." [24]

5. Dr. Snehal Tare (2019) in 'HR ANALYTICS: THE BUSINESS NEEDS TO IMPROVE ORGANIZATIONAL PERFORMANCE' states that HR managers are

supported in fulfilling HR responsibilities through the use of HR analytics. The application of HR analytics generates, analyzes, and stores large amounts of employee data, enabling managers to assess employee performance. This analytical approach helps in leveraging data to address workforce challenges. The utilization of HR analytics for predictive decision-making enables organizations to enhance organizational performance. Considering the anticipated growth of HR analytics, HR managers need to acquire and develop technical skills for effective implementation. The study concludes that improving organizational performance is pivotal for businesses to gain a competitive edge.[25]

6. "Nada Alshaikhi (2021) in 'An Assessment of Teachers' Performance Management System: The Case of Saudi Ministry of Education' investigates whether the performance management system provides all the necessary data to reflect the effectiveness and productivity of teachers. The study aims to assess how well the current performance management system represents the actual performance of Saudi instructors. Despite being generally unpopular with teachers, the current performance management systems need reevaluation as they fail to effectively assess teacher performance or meet their needs for professional growth. The study emphasizes the importance of addressing the concerns and difficulties associated with the adoption of performance management systems in the educational context." [26]

The review of the above-mentioned literature points out certain key inferences as mentioned below:

- The appraiser may periodically evaluate the employee's contribution to the organization, as well as all employees who have been performing well.
- To establish systemic approaches that resemble best practices and aim to create a professional culture of collaboration.
- Private organizations should regularly evaluate employees' performance.
- A critical analysis of the past is inevitable when making any organizational decisions.
- Organizational leaders should be aware of the potential of HR analytics.
- The current performance management systems for teachers need to be reevaluated because they do not effectively assess their performance or meet their needs for professional growth.
- Analytical tools can assist organizations in identifying difficulties with performance, staff retention and turnover, and employee conduct.

Compiled Inference

- Analytics-based HR is taking over traditional HR.

- HR, as a productive domain, is still undermined because of the subjectivity associated with its functions.
- Off late, many elite, big, and small organizations are realizing the huge untapped potential of HR Analytics to improve productivity and return on investment.
- A lot of data exists that can be precisely mined for use in HR analytics, leading to more objective decision-making.
- This would lead to a more transparent and inclusive work culture.
- It can be incorporated into every aspect of HRM, starting from recruitment, selection, training, succession planning, appraisal, performance management, and retention, to name a few.
- Many sectors/domains/industries are yet to incorporate or adopt these practices, though the potential is huge. From the available literature, it is evident that education is one such sector where analytics has not been used as much.
- Hence, we would focus the study further in the education sector with a specific focus on secondary schools.

Methodology for literature review

The paper is solely review-based, critically analyzing past data. Articles and conference papers related to the field were searched online using keywords such as HR Analytics, Performance Appraisal, CBSE school teachers, and Improvement in teacher's performance. Some data were also obtained from physical sources.

HR Analytics is not a very traditional topic [27]; it was noted that some studies were conducted on HR Analytics in 2014. Since 2019, research has been continuously conducted, and this trend persists to date. The available literature has laid a solid foundation for further study. From the collected data, it is evident that HR Analytics has been extensively used by corporate sectors and has proven to be very effective for their HR functions. [28]

Furthermore, while performance appraisal is a regular practice in industries, it is less common in schools for CBSE teachers. Thus, there is an apparent gap in the use of HR Analytics and its tools for appraising teacher's performance in secondary schools (CBSE), making it a promising research topic.[29]

The study involved reading around 100 papers (including research journals, review papers, and conference proceedings) and referring to 24 journals. All the referred papers directly align with the focus of this study within the field of HR Analytics and performance appraisal of school teachers.

The primary goal of the study is to explore the impact of performance appraisal on the performance of CBSE school teachers, and descriptive analytics tools were used to evaluate the data.

Factors responsible for varied teacher outcomes:

- Facility available
- Proper & timely monitoring
- Skilled teachers
- Healthy environment
- A good course curriculum
- Training and development program

Conclusion:

The impact/influence of conducting performance appraisals of secondary school teachers is keenly observed. The literature shows that there is a positive correlation between teacher performance appraisals (TPA) and their performance in schools. The teacher's contribution to the school is directly proportional to the students' results. The outcomes of teachers differ from school to school and situation to situation. From the study, it is believed that performance appraisal for CBSE school teachers is essential for several reasons, such as feedback, improvement, recognition, motivation, accountability, professional development, quality assurance, alignment with school objectives, and succession planning. Performance appraisals assist in identifying high-performing teachers who can take up leadership roles or mentor other teachers. It aids in succession planning and nurturing a talent pipeline within the school.

It's important to note that the design and implementation of performance appraisal systems should be fair, transparent, and based on clear criteria that consider both quantitative and qualitative aspects of teaching. Regular feedback and open communication between teachers and evaluators are crucial for an effective performance appraisal process.

After observing all the above cases, we can conclude that a well-structured appraisal system is proven to be effective for teachers' performance and students' results. However, an effective teacher appraisal system should aim to support and empower teachers in their professional growth while also ensuring accountability and maintaining high teaching standards.

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