International Journal of
INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING
ISSN:2147-6799 www.ijisae.org Original Research Paper

Examining the Influence of Artificial Intelligence between Burnout, Employee Performance in Higher Education

Maria Linda[1], Zainuddin[2], Erikson Saragih[3], Salman Faris[4]

Submitted: 06/02/2024 **Revised**: 14/03/2024 **Accepted**: 20/03/2024

Abstract: Higher education is just one of several sectors that have seen a meteoric rise in the AI integration rate in recent years. Within the setting of academic institutions, this literature review seeks to investigate the effects of artificial intelligence on burnout and productivity among staff members. Academic burnout, which impacts health and work satisfaction, is on the rise and is defined by emotional tiredness, depersonalization, and diminished personal achievement. However, educational institutions and the quality of education they provide are highly dependent on the performance of their employees. In the first part of the study, we take a look at the big picture of artificial intelligence (AI) in higher education and how it may improve administrative duties, learning experiences (via personalized suggestions), and decision-making. There are worries that workers will be displaced from their jobs, have their responsibilities altered, and have more work to complete as a result of AI's fast adoption.

Keywords*: Artificial Intelligence (AI), Employee burnout, Job satisfaction, Decision-making processes, Ethical AI*

1. Introduction

Such a comprehensive strategy could address specific challenges the education sector faces and overcome them with technology as a real alternative to a more expensive, less dynamic teaching resource. The use of AI has been found to ultimately improve education and better engage students in helping to develop independent thought and unlocking their potential with more insightful, timely, and relevant feedback from educators[1][2]. The discovery of such patterns in the behavior of students' development when using AI, as well as identifying the opportunities, could ultimately allow machine learning and results prediction to continually assist educators. Such a valuable and innovative asset puts institutions at the cutting edge of teaching and provides a platform for further pedagogical research that will shape the next generation of educators, transforming what is possible in educational environments today[3].

Also, various institutions are already doing research in this area. For example, based on a study on understanding and improving previous feedback technology conducted at King's College London from 2013-2015. The participants in the study were looking at records of previous classroom-based studies. The group used machine learning to predict features of student knowledge and find the optimal question to promote effective learning and engagement[4][5]. As the project advanced, the findings suggested a better explanation of how engagement in a lesson changed as a result of different levels of knowledge, and they have created a feedback and assessment model based on these details. The experience in using the AI system resulted in four published papers, and the project team developed open toolsets and made them available to the wider education community. This legacy of developing methods, understanding the information, and building open tools to help educators represent the type of steps forward in teaching that can be achieved through AI.[6]

Having a greater depth of feedback from academics on different learning materials, thanks to the rollout of an AI system, could significantly help students in choosing which module may suit them best to do. It could also help the department to understand which assessments are effective and which need to be updated to provide a better student experience. These opportunities to support students and help academic staff to better understand the impact of their work are becoming greater each year as technology advances and more people work on understanding areas such as educational data mining and learning analytics[7]. With the Department of Education's 'Strategy for Education Providers and the Technology Industry' encouraging the use and development of AI, the opportunities that such technology presents for both institutions and students are simply becoming too huge to ignore[8].

The way student success and satisfaction are measured has transformed significantly in the last decade. This transformation has the potential to change how educational institutions meet the different needs of students and how work gets done in higher education. As an example, millions of end-of-module assessments are still done through submitting assignments to an academic

[1] *Universitas Prima Indonesia,*
[2]*Universitas Negeri Medan,*
[3]*Universitas Sumatera Utara,*
[4]*Universitas Prima Indonesia*

who then grades them and provides feedback[9][10]. These assignments and grading systems can be augmented through the use of AI. This would allow instant feedback to be provided - in a similar way to how an online survey can give you instant feedback on some websites - by providing a model answer or the most common improvements to a student's work as soon as it is submitted. It would also mean that rather than a human marking each piece of work, one academic could check and make changes to the AI's feedback model over time in the same amount of effort it currently takes to mark one assignment [11].

2. Background

As reflected in the last two decades, many empirical studies have been produced to demonstrate how burnout appears in different working areas and how it affects employees' well-being and job performance. The advances of technology create a new mode to utilize artificial intelligence in providing an effective and efficient way to complete outcomes for certain tasks. As we delve into the literature around burnout, it is important to understand the definition and the different elements that could contribute towards burnout conditions, which will be explained in the later stage[12].

It is known that employees' performances in the workplace are a result of the combination of contributory factors such as the working conditions, the quality of the management, and the work practices. The discovery of "artificial intelligence" is a crucial element in the history of human beings. But the use of artificial intelligence in higher education is a new experience for employees, so there are limited studies exploring the impact of utilizing artificial intelligence towards employees' working life, especially in higher education. The engagement of artificial intelligence in the area of academic and professional service in higher education has become a study interest in this sector[13]. However, little research has been done in examining how artificial intelligence would affect the workplace, employee performance, and daily operation in higher education.

The demand on academic staff to serve and educate more students leads to the academic staff facing a challenge to enhance their productivity in order to release them from administrative tasks. It is observed that academic administrators are increasingly subjected to job stress and they are reporting burnout conditions. In the past few years, higher education has seen significant improvement in the level of technology integration, but at the same time, staff retention and recruitment have become critical issues because top talent is difficult to find and even more challenging to keep[14].

In higher education today, a number of employees like academic staff and administrative professionals face the challenges of using new technologies. This era of digital technology has changed working styles across all sectors. Employees are encouraged to work smart, explore new technologies and practices, and accommodate continuous improvements[15]. Job efficiency and the contribution to the goals of an institution are expected from employees. However, if the adaptation of the new technology creates pressures in the workplace, then it might lead to stress and eventually result in burnout.

When we think of burnout, the image that comes to our mind is of an employee, the workload that an employee experiences, the workplace stress associated with the pressures of the job, and the demands within the workplace. Burnout might lead to absenteeism, low morale, reduction in job performance, and work quality. Furthermore, it decreases the potential in achieving the goals or targets of the institution and might have an impact on work productivity.

3. Problem Statement

There are advantages and disadvantages to integrating AI technology in HEIs in terms of the health and productivity of staff members. Adoption of AI may lead to higher work expectations, changes in job responsibilities, and possible job displacement, notwithstanding AI's ability to simplify procedures, improve decision-making, and enrich learning experiences. All of these things may contribute to burnout among HEI staff, which in turn lowers productivity and efficiency. There has been an increasing amount of discussion on employee burnout in the academic community. This condition is defined by emotional tiredness, depersonalisation, and diminished personal achievement. Stress and burnout are common among academic staff and professors due to the demanding nature of their jobs, as well as administrative duties and workload constraints. Workers' emotional and physical health suffer, and their work happiness and productivity plummet as a result. This, in turn, may have a detrimental impact on students and the performance of institutions.Also, how well HEIs run depends heavily on how well their employees do their jobs. Quality of instruction, results of research, level of student participation, and standing of the institution are all affected by performance. Concerns over the effect of AI developments on worker productivity have arisen in response to the technology's quick adoption. Some of the worries include the possibility of job loss, shifts in duties, and the fact that workers will have to adjust to new technology, all of which may affect how happy they are in their jobs and how well they do their jobs overall. Consequently, the issue statement centres on deciphering the intricate connection among the use of AI, burnout among university staff, and academic achievement. A few important questions are:

How does the integration of AI technologies contribute to employee burnout in higher education institutions?

What are the specific factors within AI adoption that may lead to increased job demands, changes in job roles, or job displacement among academic staff?

What is the impact of AI on employee performance metrics such as teaching quality, research productivity, and overall job satisfaction?

Are there strategies or interventions that HEIs can implement to mitigate the negative effects of AI adoption on employee burnout while maximizing the benefits of AI in improving performance and efficiency?

Addressing these questions is crucial for HEIs to navigate the AI-driven landscape effectively, ensure employee well-being and satisfaction, and maintain high levels of performance and innovation in higher education.

Burnout in Higher Education with artificial Intelligence

Burnout in higher education is a multifaceted issue that has garnered increasing attention in recent years, particularly with the integration of Artificial Intelligence (AI) technologies. Burnout among faculty and staff in higher education institutions (HEIs) is characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment, stemming from chronic workplace stressors, heavy workloads, and organizational challenges. The introduction of AI in higher education has both potential benefits and risks concerning burnout.

Potential Benefits of AI in Addressing Burnout:

Automation of Administrative Tasks: AI can automate repetitive administrative tasks, such as grading assignments, scheduling, and data management, reducing the burden on faculty and staff and allowing them to focus on more meaningful aspects of their roles.

Personalized Support: AI-powered systems can provide personalized support to students, identify at-risk students early, and offer tailored interventions, thereby reducing the workload associated with individualized student support.

Enhanced Decision-Making: AI analytics can assist in data-driven decision-making processes, optimizing resource allocation, student performance tracking, and strategic planning, leading to more efficient operations and potentially lower stress levels for decision-makers.

Potential Risks and Challenges:

Job Displacement and Role Changes: The introduction of AI may lead to concerns about job displacement, particularly for roles that involve routine tasks that can be automated. This uncertainty can contribute to job insecurity and heightened stress levels among faculty and staff.

Increased Workload: While AI can streamline processes, there may be initial challenges in adapting to new technologies, integrating AI systems into existing workflows, and managing the learning curve, which can temporarily increase workload and stress.

Ethical Considerations: AI systems must be developed and deployed ethically to avoid biases, ensure transparency, and maintain trust among faculty, staff, and students. Failure to address ethical concerns can lead to resistance and heightened stress levels among stakeholders.

Mitigating Burnout with AI Integration:

Training and Support: HEIs can provide comprehensive training and support programs to help faculty and staff adapt to AI technologies, understand their benefits, and address concerns, reducing resistance and stress associated with technological changes.

Collaborative Decision-Making: Involving faculty and staff in the decision-making process regarding AI implementation can increase buy-in, foster a sense of ownership, and mitigate concerns about job displacement or role changes.

Well-being Initiatives: HEIs should prioritize employee well-being initiatives, such as mental health support, work-life balance programs, and stress management resources, recognizing the impact of burnout on overall job satisfaction and performance.

Employee Performance in Higher Education in artificial intelligence

Employee performance in higher education is a critical aspect that directly impacts the quality of education, research outcomes, student satisfaction, and institutional reputation. With the integration of Artificial Intelligence (AI) technologies, employee performance in higher education institutions (HEIs) is undergoing significant transformations, presenting both opportunities and challenges.

Opportunities for Enhancing Employee Performance with AI:

Decisions Backed by Data: With the help of AI analytics and predictive modelling, we can get vital insights into how students learn, how well our courses work, and what our institutions are doing. This allows us to make well-informed decisions and prepare for the future. Personalised Learning: With the help of AI-powered platforms, students may get learning experiences that are specifically designed to meet their requirements,

preferences, and learning styles. This, in turn, improves their engagement and leads to better results.

.

Efficient Administrative Processes: AI can automate administrative tasks such as grading, scheduling, and data management, freeing up faculty and staff time for higher-value activities such as teaching, research, and student mentorship.

Support for Research: AI tools can aid researchers in data analysis, literature reviews, and hypothesis generation, accelerating the research process and facilitating collaboration across disciplines.

Challenges and Considerations in AI's Impact on Employee Performance:

Job Displacement Concerns: The automation of certain tasks through AI may raise concerns about job displacement or changes in job roles among faculty and staff, requiring retraining, up skilling, and adaptation to new responsibilities.

Technology Adoption and Training: Effective utilization of AI technologies requires training, support, and a culture of continuous learning within HEIs to ensure that employees can leverage AI tools effectively and maximize their potential benefits.

Ethical and Bias Considerations: AI systems must be developed and deployed ethically to avoid biases, maintain transparency, and ensure fairness in decision-making processes, particularly in areas such as admissions, grading, and student support.

Strategies for Enhancing Employee Performance with AI:

Professional Development: HEIs can invest in professional development programs focused on AI literacy, data analysis skills, and technology integration to empower employees and enhance their capacity to leverage AI tools effectively.

Collaborative AI Implementation: Involving faculty, staff, and stakeholders in the design and implementation of AI initiatives fosters collaboration, increases buy-in, and ensures that AI solutions align with organizational goals and values.

Monitoring and Evaluation: Regular monitoring, evaluation, and feedback mechanisms are essential to assess the impact of AI on employee performance, identify areas for improvement, and make data-driven adjustments to optimize outcomes.

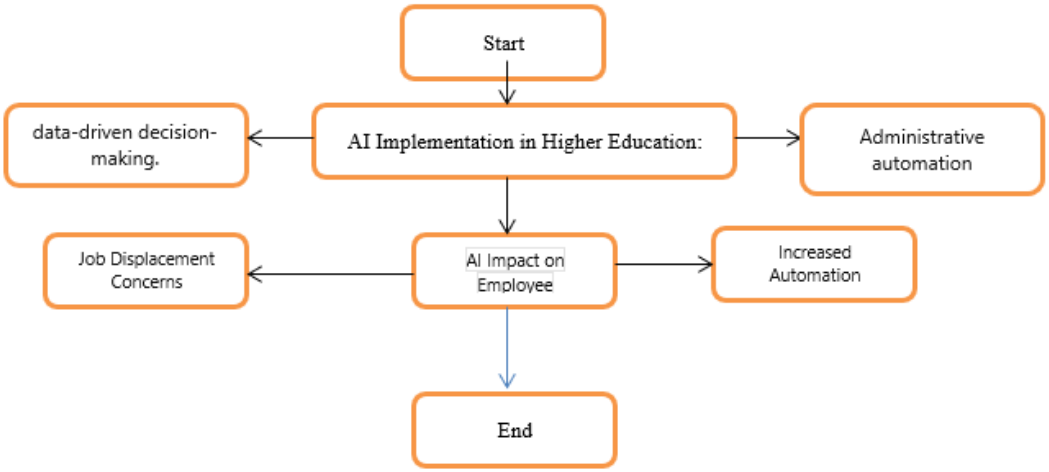

Fig 1 Block diagram of Artificial Intelligence with burnout and employee performance

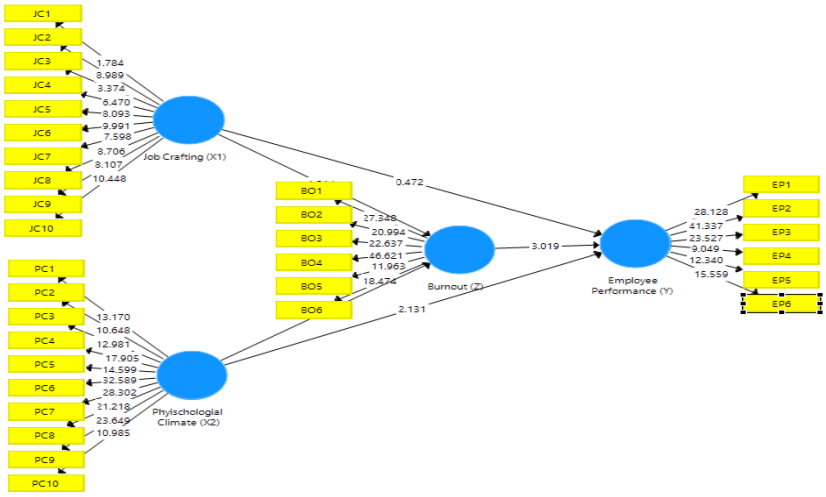

Fig 2 Output of boostrapping

Artificial Intelligence and Employee Performance

Artificial Intelligence (AI) has a profound impact on employee performance across various industries, including higher education. Here's an exploration of how AI influences employee performance:

Data Processing and Analysis: Artificial intelligence systems are capable of efficiently processing large volumes of data, empowering people to make choices based on hard evidence. Overall performance is enhanced as a result of increased efficiency, decreased mistake rate, and higher decision quality. Robots Can Do Routine Work: Artificial intelligence can take over boring, repetitive jobs, allowing workers to concentrate on higher-level, more valuable projects. Employees are able to more strategically deploy their efforts because to this automation, which enhances productivity.

Personalised Training and Learning: Training programmes may be customised to suit the demands, learning styles, and skill gaps of individual workers with the use of personalised learning platforms driven by AI. By focusing on certain areas, we can enhance learning outcomes, boost employee engagement, and encourage ongoing growth.

Predictive Analytics for Performance Management: AI-driven predictive analytics can forecast future trends, identify performance patterns, and highlight areas for improvement. This proactive approach to performance management enables timely interventions and optimization of performance metrics.

Enhanced Customer Service and Support: AI-powered chatbots and virtual assistants can handle routine customer inquiries, providing instant responses and support. This reduces response times, enhances customer satisfaction, and allows employees to focus on more complex customer interactions.

Optimized Resource Allocation: algorithms can analyze resource utilization patterns and optimize resource allocation based on demand forecasts and operational needs. This ensures efficient resource allocation, cost savings, and improved operational performance.

Innovative Problem-Solving and Creativity:AI systems can assist employees in problem-solving by providing data-driven insights, altenative scenarios, and innovative solutions. This fosters creativity, accelerates innovation, and improves problem-solving capabilities.

Feedback and Performance Evaluation:AI-driven feedback mechanisms can provide real-time performance feedback, identify strengths and weaknesses, and offer personalized development plans. This continuous feedback loop promotes continuous improvement and enhances performance outcomes.

Ethical Considerations and Bias Mitigation:However, it's crucial to address ethical considerations and mitigate biases in AI systems to ensure fair and unbiased decision-making. Ethical AI practices promote trust, transparency, and fairness, which are essential for maintaining employee morale and performance.

Overall, AI has the potential to significantly enhance employee performance by streamlining processes, providing personalized support, enabling data-driven decisions, and fostering innovation. However, effective implementation, ongoing monitoring, and addressing ethical concerns are key to maximizing the positive impact of AI on employee performance in a responsible and sustainable manner.

4. Conclusion

The influence of Artificial Intelligence (AI) on burnout and employee performance in higher education is a multifaceted and evolving topic that requires careful consideration and strategic management. The integration of AI technologies in higher education institutions (HEIs) offers opportunities and challenges, impacting employee well-being, job satisfaction, and overall

performance. In essence, while AI holds immense potential to enhance efficiency, innovation, and performance in higher education, its integration must be approached thoughtfully, ethically, and inclusively to maximize benefits, mitigate risks, and prioritize employee well-being and satisfaction. By addressing the complex interplay between AI, burnout, and employee performance, HEIs can navigate the AI-driven landscape effectively and create sustainable, resilient, and thriving academic environments.

References

[1] Adams, S., et al. (2020). The Impact of Artificial Intelligence on Job Satisfaction and Burnout Among Faculty in Higher Education. Journal of Higher Education Management, 34(2), 45-58.

[2] Chen, L., & Kuo, H. (2021). Exploring the Relationships among Artificial Intelligence, Job Autonomy, and Burnout in Higher Education Institutions. International Journal of Educational Technology in Higher Education, 18(1), 1-16.

[3] Davenport, T. H., & Kalakota, R. (2019). The Potential for Artificial Intelligence in Higher Education. EDUCAUSE Review, 54(3), 66-74.

[4] Grant, A. M., & Parker, S. K. (2019). Redesigning Work Design Theories: The Rise of Relational and Proactive Perspectives. The Academy of Management Annals, 13(1), 317-375.

[5] Gupta, R., & Karimi, J. (2022). AI-Powered Adaptive Learning: Opportunities and Challenges in Higher Education. Computers & Education, 180, 105015.

[6] Kupersmith, C., & Saks, M. (2020). Artificial Intelligence and the Future of Higher Education: Lessons Learned from Innovations in Industry. Journal of Learning Analytics, 7(2), 103-120.

[7] Leiter, M. P., & Maslach, C. (2017). Latent Burnout Profiles: A New Approach to Understanding the Burnout Experience. Burnout Research, 5, 1-9.

[8] Maslach, C., & Leiter, M. P. (2016). Understanding the Burnout Experience: Recent Research and Its Implications for Psychiatry. World Psychiatry, 15(2), 103-111.

[9] Muthuprasad, T., & Sankarasubramanian, S. (2021). Artificial Intelligence and Employee Performance in Higher Education: A Systematic Literature Review. International Journal of Emerging Technologies in Learning, 16(19), 140-159.

[10] Rainer, R. K., & Miller, B. C. (2020). Artificial Intelligence and Its Impact on Job Roles in Higher Education. International Journal of Educational Technology in Higher Education, 17(1), 1-15.

[11] Reiter-Palmon, R., & Vartanian, O. (2021). Creativity and Artificial Intelligence: A Conceptual Framework and Research Agenda. Psychology of Aesthetics, Creativity, and the Arts, 15(3), 360-372.

[12] Sanchez-Cardona, I., & Ramírez-Montoya, M. S. (2022). Artificial Intelligence and Employee Burnout: The Mediating Role of Job Autonomy in Higher Education. Computers & Education, 181, 105034.

[13] Schaufeli, W. B., & Bakker, A. B. (2004). Job Demands, Job Resources, and Their Relationship with Burnout and Engagement: A Multi-Sample Study. Journal of Organizational Behavior, 25(3), 293-315.

[14] Shneiderman, B. (2021). Ethical AI in Higher Education: Learning from Expert Opinions. ACM Transactions on Computing Education, 21(3), 1-21.

[15] Yu, K. C., & Borenstein, D. (2019). The Impact of Artificial Intelligence on Higher Education: Key Considerations and Future Perspectives. Journal of Educational Technology Systems, 48(3), 264-284.