USE OF ARTIFICIAL INTELLIGENCE IN TRAINING BUSINESS EDUCATION STUDENTS FOR OPTIMAL PERFORMANCE AFTER GRADUATION

Arunaye Florence Oghenevorho PhD
Department of Business Education Delta State University, Abraka.
florenceao@delsu.edu.ng
O8036761427
&
Maryvivian C. Oko PhD
Department of Business Education
Ebonyi State University.
Abakaliki.
okomaryvivian@gmail.com
08030512592

Abstract
This study focused on the application of artificial intelligence in employee training and development. The applications of AI in workplace training, performance evaluation and career development planning are explored. Among them, four aspects of AI in workplace training were discussed, including challenges and opportunities of workplace training, intelligent aids in workplace training, assessment and optimisation of workplace training effects, and cases of AI aids in workplace training; four aspects of performance assessment are analysed, including data collection and analysis, automated assessment tools, real-time feedback and personalised guidance, and assisted decision-making and prediction; and four aspects of career development planning, four aspects are analysed, such as AI can provide personalised career development advice for employees, AI can also help employees to discover new opportunities and challenges in their career development process, AI can also provide career development training and knowledge management, and the application of AI in career development planning also faces some challenges.

Introduction

Development and innovations in science and technology in the 21st century and Information and Communication Technology (ICT) has impacted virtually all aspects of social structures and institutions. The invention of steam engines for industrial use and electronic machines for clerical jobs has shaped and has been shaping both relations of production and accomplishment of tasks in factories and offices especially in developed economies and lately in developing nations. All these inventions are geared towards execution of task in the workplace with precision and effectiveness on the part of employers to minimize costs and maximize profits. However, they have also constitute threats to the existence of some jobs that automated machines can perform or execute. One of such advanced tools used in the offices today is artificial intelligence.

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. According to Azubuike (2022), artificial intelligence (AI) refers to the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Scout (2024) also indicated that artificial intelligence (AI) technology allows computers and machines to simulate human intelligence and problem-solving tasks. In the context of this paper, artificial intelligence refer to devices and decision-making aids that rely on automated, data driven, or algorithmic learning procedures. The ideal characteristic of artificial intelligence is its ability to rationalize and take action to achieve a specific goal. Examples of AI applications include expert systems, natural language processing (NLP), speech recognition and machine vision. Artificial intelligence devices include; robotics, self-driving car, smart home, AI television, computer vision, digital assistants, chatbots, face recognition machines, natural language processing equipment, security management tool, smart lock among others.

Artificial intelligence can be applied to all social sectors of life, including manufacturing industries, business, education, healthcare, skills development among others (Ebeh, 2019). Other examples

of machines with artificial intelligence include computers that play chess and self-driving cars. AI has applications in the financial industry, where it detects and flags fraudulent banking activity. Applications of Artificial intelligence can help streamline and make trading easier. In 2022, AI entered the mainstream with applications of Generative Pre-Training Transformer. The most popular applications are OpenAI's DALL-E text-to-image tool and ChatGPT. According to Deloitte (2024), 79% of respondents who are leaders in the AI industry, expect generative AI to transform their organizations by 2027. Based on this, there is need for the utilisation of artificial intelligence in training business education students in employability skills and entrepreneurial development after graduation. The areas artificial intelligence could be used in teaching and training of business education students include writing, office skills, accounting and auditing. In writing, artificial intelligence is one of the teaching tools that could be adopted by business educators in improving students writing skills.

A Worker or an employee are individuals or a person who works. This usually means a person who does manual labour, like manufacturing goods. In economics, there are three factors of production. These are labour (the work done by workers), land (usually people need some space to produce something), and capital (it will cost resources, or money, to produce something). The worker is at the epicenter of any production process (Echefuna, 2022). The effectiveness of an organization is largely dependent on the quality of its employees, as organizational success hinges on recruiting individuals with the necessary skills to meet strategic goals. Artificial intelligence is becoming increasingly integral to human resource management, which involves many routine and time-consuming tasks, often influenced by human perception and biases, making it an ideal area for AI application. Based on this, there is need for adequate training of workers with artificial intelligence for organizational development.

Artificial intelligence can be used in developing workers in many ways such as office management (typesetting with Marvis Beacon) office arrangement, book keeping with automated filing, decision making tools with calculators, analysis with ChatGPT among others AI technology makes it possible to apply AI in workplace training. Artificial intelligence can also be used to improve workers skills in organizational management and skill training for organizational performance. Application of artificial intelligence in human resources training is an avenue to reduce the high cost of human resource development as it is convenient and workers' centered method.

Despite the importance and roles of artificial intelligence in human resource training in an organsiation in the present time, in Nigeria, most organization including educational sector still adopt traditional human resource development which is both cost effective and cumbersome. It appears that most administrators in organisations do not know the importance of artificial intelligence in human resource development in their organizations. It is based on this that the paper explores various ways artificial intelligence could be adopted for training and retraining of workers for organizational performance (sources?)

Characteristics of artificial intelligence

There are a number of different forms of learning as applied to artificial intelligence. The simplest is learning by trial and error. For example, a simple computer program for solving mate-in-one chess problems might try moves at random until mate is found. The program might then store the solution with the position so that the next time the computer encountered the same position it would recall the solution. This simple memorizing of individual items and procedures—known as rote learning—is relatively easy to implement on a computer. More challenging is the problem of implementing what is called generalization. Generalization involves applying past experience to analogous new situations. For example, a program that learns the past tense of regular English verbs by rote will not be able to produce the past tense of a word such as *jump* unless it previously had been presented with *jumped*, whereas a program that is able to generalize can learn the "add *ed*" rule and so form the past tense of *jump* based on experience with similar verbs.

Reasoning: To reason is to draw inferences appropriate to the situation. Inferences are classified as either deductive or inductive. An example of the former is, "Fred must be in either the museum or the café. He is not in the café; therefore he is in the museum," and of the latter, "Previous accidents of this sort were caused

by instrument failure; therefore this accident was caused by instrument failure." The most significant difference between these forms of reasoning is that in the deductive case the truth of the premises guarantees the truth of the conclusion, whereas in the inductive case the truth of the premise lends support to the conclusion without giving absolute assurance. Inductive reasoning is common in science, where data are collected and tentative models are developed to describe and predict future behaviour—until the appearance of anomalous data forces the model to be revised. Deductive reasoning is common in mathematics and logic, where elaborate structures of irrefutable theorems are built up from a small set of basic axioms and rules. There has been considerable success in programming computers to draw inferences. However, true reasoning involves more than just drawing inferences: it involves drawing inferences *relevant* to the solution of the particular task or situation. This is one of the hardest problems confronting AI.

Problem solving: Problem solving, particularly in artificial intelligence, may be characterized as a systematic search through a range of possible actions in order to reach some predefined goal or solution. Problem-solving methods divide into special purpose and general purpose. A special-purpose method is tailor-made for a particular problem and often exploits very specific features of the situation in which the problem is embedded. In contrast, a general-purpose method is applicable to a wide variety of problems. One general-purpose technique used in AI is means-end analysis—a step-by-step, or incremental, reduction of the difference between the current state and the final goal. The program selects actions from a list of means—in the case of a simple robot this might consist of PICKUP, PUTDOWN, MOVEFORWARD, MOVEBACK, MOVELEFT, and MOVERIGHT—until the goal is reached. Many diverse problems have been solved by artificial intelligence programs. Some examples are finding the winning move (or sequence of moves) in a board game, devising mathematical proofs, and manipulating "virtual objects" in a computer-generated world.(sources?)

Perception: In perception the environment is scanned by means of various sensory organs, real or artificial, and the scene is decomposed into separate objects in various spatial relationships. Analysis is complicated by the fact that an object may appear different depending on the angle from which it is viewed, the direction and intensity of illumination in the scene, and how much the object contrasts with the surrounding field. One of the earliest systems to integrate perception and action was FREDDY, a stationary robot with a moving television eye and a pincer hand, constructed at the University of Edinburgh, Scotland, during the period 1966–73 under the direction of Donald Michie. FREDDY was able to recognize a variety of objects and could be instructed to assemble simple artifacts, such as a toy car, from a random heap of components. At present, artificial perception is sufficiently advanced to enable optical sensors to identify individuals and autonomous vehicles to drive at moderate speeds on the open road.

Language: A language is a system of signs having meaning by convention. In this sense, language need not be confined to the spoken word. Traffic signs, for example, form a mini-language, it being a matter of convention that ⚠️ means "hazard ahead" in some countries. It is distinctive of languages that linguistic units possess meaning by convention, and linguistic meaning is very different from what is called natural meaning, exemplified in statements such as "Those clouds mean rain" and "The fall in pressure means the valve is malfunctioning." An important characteristic of full-fledged human languages—in contrast to birdcalls and traffic signs—is their productivity. A productive language can formulate an unlimited variety of sentences. Large language models like ChatGPT can respond fluently in a human language to questions and statements. Although such models do not actually understand language as humans do but merely select words that are more probable than others, they have reached the point where their command of a language is indistinguishable from that of a normal human. What, then, is involved in genuine understanding, if even a computer that uses language like a native human speaker is not acknowledged to understand? There is no universally agreed upon answer to this difficult question.(sources?)

Application of artificial intelligence in employees' training

Workplace training is an important way for organisations to provide development and learning opportunities for their employees, and the continuous progress of AI technology makes it possible to apply

AI in workplace training. This section will explore the application of AI in workplace training. In modern society, workplace training faces a series of challenges. Firstly, with the explosion of information, employees are often faced with a large number of information elements, making it difficult to filter and absorb effective information. Secondly, traditional workplace training methods tend to be uniform and fixed, unable to meet the individual needs of different employees. In addition, some enterprises face problems such as high training costs and difficulty in evaluating the effects. However, the application of AI technology provides new opportunities to solve these problems.

Intelligent aids in workplace training: The application of artificial intelligence technology provides intelligent auxiliary tools for workplace training, which can provide personalised learning resources and guidance according to the needs and background of employees. First, based on personalised recommendation algorithms, AI can recommend training courses and learning materials that meet the needs of employees based on their learning history, career development plans and other information. Second, the virtual teaching assistant system can intelligently interact with employees to answer questions and provide feedback through voice recognition and natural language processing technology. Further, using virtual reality technology, AI can simulate real work scenes, allowing employees to train and practice in a virtual environment to enhance the learning effect.

Assessment and optimisation of workplace training effects: Artificial intelligence technology can also be used for the evaluation and optimisation of workplace training effects. Through learner behaviour analysis and data mining technology, the learning outcomes and effects of workplace training can be quantitatively assessed. For example, employees' learning behaviours and performance during the learning process, such as learning time and learning progress, can be analysed to assess their learning outcomes. At the same time, combined with machine learning algorithms, the training process and content can be optimised, and the training resources and methods can be adjusted according to the employees' learning path and feedback information to improve the training effect.

Application of Artificial Intelligence in Performance Appraisal: Performance evaluation is an important part of human resource management. By evaluating and providing feedback on employees' performance, it can help companies understand their employees' working ability and contribution, and thus provide reasonable salary incentives and promotion opportunities. With the development of AI technology, more and more enterprises are exploring the application of AI in performance assessment. The application of artificial intelligence in performance evaluation is mainly reflected in the following aspects. Data collection and analysis. Artificial intelligence can automate the collection and analysis of massive data by integrating employees' work data, performance data and other relevant data. Through automation, AI can reduce the subjective factors and errors in traditional performance evaluation and improve the objectivity and accuracy of the evaluation. At the same time, AI can also use the technology of machine learning and data mining to predict and analyse trends in employee performance, helping companies identify and respond to potential problems in a timely manner.

Automated assessment tools. Artificial intelligence can develop a variety of automated assessment tools to assist in the performance assessment process. These tools can automate the process of evaluating and scoring an employee's work based on set evaluation criteria and metrics, as well as generating corresponding evaluation reports. With automated assessment tools, the time and effort of the HR department can be saved, and the efficiency and consistency of the assessment can be improved.

Real-time feedback and personalised coaching. Artificial intelligence can provide real-time feedback and guidance by instantly monitoring and analysing employees' work. Through the intelligent system, personalised development plans and training programmes can be tailored according to employees' performance and needs, helping them to improve their work ability and career development. At the same time, AI can also track employees' progress and improvement, and timely adjust and optimise performance evaluation criteria and indicators.

Assisted decision-making and prediction. Artificial intelligence can make use of big data and algorithmic models to provide comprehensive analysis and decision-making support for the results of an enterprise's performance evaluation. By analysing data from the internal and external environments of the enterprise, AI can predict the results and influencing factors of the performance assessment and help the

enterprise to develop a more scientific and reasonable compensation incentive and promotion mechanism. At the same time, AI can also identify and prevent potential performance problems and provide decision-makers with references and suggestions in performance management.

Application of Artificial Intelligence in Career Development Planning: As an emerging technology, artificial intelligence is playing an increasingly important role in the field of human resource management. The application of AI in career development planning has shown great potential. This section aims to explore the specific applications of AI in career development planning and analyse the implications and challenges. Firstly, AI can provide personalised career development advice to employees. Traditional career development planning is often based on the experience and judgement of HR departments and managers, which often fails to take into account the individual differences and future development potential of each employee. AI, on the other hand, can accurately assess and analyse each employee by analysing their personal data, work performance and behavioural patterns, and provide them with personalised career development paths and advice to help them achieve optimal development.

Secondly, AI can also help employees discover new opportunities and challenges during their career development. By analysing a large amount of career development data and trends, AI can help employees understand the current and future job market and predict career needs and trends. In this way, employees can more accurately understand their individual career competitiveness and market value, adjust their career development plans in a timely manner, seize opportunities and meet challenges. In addition, AI can provide career development training and knowledge management. Through intelligent learning systems and knowledge bases, employees can access relevant training resources and knowledge content anytime, anywhere, which not only improves the convenience and efficiency of learning, but also makes career development more sustainable and orderly. Artificial intelligence can recommend appropriate training courses and learning resources based on employees' career needs and interests, helping them to continuously grow their professional skills and knowledge base.

However, the application of AI in career development planning also faces some challenges. The first is the issue of data privacy and security. As AI needs to access and analyse a large amount of employee data, protecting data privacy and ensuring security have become important tasks. The second is technological limitations and uncertainties. The application of AI is still in the stage of continuous development and improvement, and the technical capability and reliability still need to be improved. In addition, employees' acceptance and ability to use AI need to be further improved.

Advantages artificial intelligence.

AI technologies, particularly deep learning models such as artificial neural networks, can process large amounts of data much faster and make predictions more accurately than humans can. While the huge volume of data created on a daily basis would bury a human researcher, AI applications using machine learning can take that data and quickly turn it into actionable information. A primary disadvantage of AI is that it is expensive to process the large amounts of data AI requires. As AI techniques are incorporated into more products and services, organizations must also be attuned to AI's potential to create biased and discriminatory systems, intentionally or inadvertently.

The following are some advantages of AI:

i. **Excellence in detail-oriented jobs.** AI is a good fit for tasks that involve identifying subtle patterns and relationships in data that might be overlooked by humans. For example, in oncology, AI systems have demonstrated high accuracy in detecting early-stage cancers, such as breast cancer and melanoma, by highlighting areas of concern for further evaluation by healthcare professionals.

ii. **Efficiency in data-heavy tasks.** AI systems and automation tools dramatically reduce the time required for data processing. This is particularly useful in sectors like finance, insurance and healthcare that involve a great deal of routine data entry and analysis, as well as data-driven decision-making. For example, in banking and finance, predictive AI models can process vast volumes of data to forecast market trends and analyze investment risk.

iii. **Time savings and productivity gains.** AI and robotics can not only automate operations but also improve safety and efficiency. In manufacturing, for example, AI-powered robots are increasingly used to perform hazardous or repetitive tasks as part of warehouse automation, thus reducing the risk to human workers and increasing overall productivity.

iv. **Consistency in results.** Today's analytics tools use AI and machine learning to process extensive amounts of data in a uniform way, while retaining the ability to adapt to new information through continuous learning. For example, AI applications have delivered consistent and reliable outcomes in legal document review and language translation.

v. **Customization and personalization.** AI systems can enhance user experience by personalizing interactions and content delivery on digital platforms. On e-commerce platforms, for example, AI models analyze user behavior to recommend products suited to an individual's preferences, increasing customer satisfaction and engagement.

vi. **Round-the-clock availability.** AI programs do not need to sleep or take breaks. For example, AI-powered virtual assistants can provide uninterrupted, 24/7 customer service even under high interaction volumes, improving response times and reducing costs.

vii. **Scalability.** AI systems can scale to handle growing amounts of work and data. This makes AI well suited for scenarios where data volumes and workloads can grow exponentially, such as internet search and business analytics.

viii. **Accelerated research and development.** AI can speed up the pace of R&D in fields such as pharmaceuticals and materials science. By rapidly simulating and analyzing many possible scenarios, AI models can help researchers discover new drugs, materials or compounds more quickly than traditional methods.

ix. **Sustainability and conservation.** AI and machine learning are increasingly used to monitor environmental changes, predict future weather events and manage conservation efforts. Machine learning models can process satellite imagery and sensor data to track wildfire risk, pollution levels and endangered species populations, for example.

x. **Process optimization.** AI is used to streamline and automate complex processes across various industries. For example, AI models can identify inefficiencies and predict bottlenecks in manufacturing workflows, while in the energy sector, they can forecast electricity demand and allocate supply in real time (Okereke, 2019)

Disadvantages of Artificial intelligence

The following are some disadvantages of AI:

- **High costs.** Developing AI can be very expensive. Building an AI model requires a substantial upfront investment in infrastructure, computational resources and software to train the model and store its training data. After initial training, there are further ongoing costs associated with model inference and retraining. As a result, costs can rack up quickly, particularly for advanced, complex systems like generative AI applications; OpenAI CEO Sam Altman has stated that training the company's GPT-4 model cost over $100 million.
- **Technical complexity.** Developing, operating and troubleshooting AI systems -- especially in real-world production environments -- requires a great deal of technical know-how. In many cases, this knowledge differs from that needed to build non-AI software. For example, building and deploying a machine learning application involves a complex, multistage and highly technical process, from data preparation to algorithm selection to parameter tuning and model testing.
- **Talent gap.** Compounding the problem of technical complexity, there is a significant shortage of professionals trained in AI and machine learning compared with the growing need for such skills. This gap between AI talent supply and demand means that, even though interest in AI applications is growing, many organizations cannot find enough qualified workers to staff their AI initiatives.
- **Algorithmic bias.** AI and machine learning algorithms reflect the biases present in their training data -- and when AI systems are deployed at scale, the biases scale, too. In some cases, AI systems may even amplify subtle biases in their training data by encoding them into reinforceable and pseudo-objective

patterns. In one well-known example, Amazon developed an AI-driven recruitment tool to automate the hiring process that inadvertently favored male candidates, reflecting larger-scale gender imbalances in the tech industry.

- **Difficulty with generalization.** AI models often excel at the specific tasks for which they were trained but struggle when asked to address novel scenarios. This lack of flexibility can limit AI's usefulness, as new tasks might require the development of an entirely new model. An NLP model trained on English-language text, for example, might perform poorly on text in other languages without extensive additional training. While work is underway to improve models' generalization ability -- known as domain adaptation or transfer learning -- this remains an open research problem.
- **Job displacement.** AI can lead to job loss if organizations replace human workers with machines -- a growing area of concern as the capabilities of AI models become more sophisticated and companies increasingly look to automate workflows using AI. For example, some copywriters have reported being replaced by large language models (LLMs) such as ChatGPT. While widespread AI adoption may also create new job categories, these may not overlap with the jobs eliminated, raising concerns about economic inequality and reskilling.
- **Security vulnerabilities.** AI systems are susceptible to a wide range of cyberthreats, including data poisoning and adversarial machine learning. Hackers can extract sensitive training data from an AI model, for example, or trick AI systems into producing incorrect and harmful output. This is particularly concerning in security-sensitive sectors such as financial services and government.
- **Environmental impact.** The data centers and network infrastructures that underpin the operations of AI models consume large amounts of energy and water. Consequently, training and running AI models has a significant impact on the climate. AI's carbon footprint is especially concerning for large generative models, which require a great deal of computing resources for training and ongoing use.
- **Legal issues.** AI raises complex questions around privacy and legal liability, particularly amid an evolving AI regulation landscape that differs across regions. Using AI to analyze and make decisions based on personal data has serious privacy implications, for example, and it remains unclear how courts will view the authorship of material generated by LLMs trained on copyrighted works (Okereke, 2019)

Conclusion

The paper concludes that application of artificial intelligence in workplace training has brought innovation to traditional training methods. Through intelligent assistive tools and data analysis technology, AI can provide employees with personalized learning resources and guidance, and evaluate and optimise training effects. With the continuous progress and application of AI technology, workplace training will become more efficient and personalised, providing strong support for employees' career development and organizational development.

The application of AI in performance appraisal can improve the objectivity and accuracy of the appraisal, save the time and effort of the HR department, and provide personalised development guidance and decision support. However, in the process of applying AI, care also needs to be taken to protect employee privacy and data security to ensure the fairness and credibility of the assessment. In the future, with the continuous development and improvement of AI technology, it is believed that the application of AI in performance assessment will be more extensive and in-depth. The application of AI in career development planning is promising and can help employees achieve personalised career development, identify new opportunities and challenges, and provide training and knowledge management support. However, to realise the full potential of AI, data privacy and security issues need to be addressed, and the level of technology and employee acceptance needs to be continuously improved. It is only on the basis of overcoming these challenges that AI can be better applied to career development planning and help employees achieve mutual personal and organisational development..

Recommendations

1. Educational institutions should keep pace with rapidly evolving technology, to enable individuals to be future ready and reduce their rate of obsolescence.

2. Employers who have the intention of using AI in their place of work should retrain their staff to new tasks when the old ones would be taken over by automated machines.
3. There would be less interactions between human beings in offices and other places of work as automated machines takeover most of the jobs. This will reduce the spirit of camaraderie at the place of work which boost the morale of staff.

References

Acemoglu, D. & Restrepo, P. (2017). Robots and jobs: evidence from US labor markets. *National Bureau of Economic Research, NBER Working Paper*, (23285).

Acemoglu, D. & Restrepo, P. (2018). *Artificial intelligence, automation and work.* NBER Working Paper, 24196. Cambridge, MA: National Bureau of Economic Research

Aghion P, & Howitt P (1990). *A model of growth through creative destruction*. NBER Working Paper 3223. Cambridge, MA: National Bureau of Economic Research. Aghion P, Howitt P (1994). Growth and unemployment. *Rev Econ Stud* (61),477–494.

Audu, R., Kamin, Y.B, and Saud, M.S. B. (2013). Acquisition of employability skills in technical vocational education: Necessity for the 21st century workforce. *Australian Journal of Basic and Applied Sciences*, (7):6, 9-14.

Australian National Initiative and Performance Directorate (2017). Education: Future frontiers. The implications of AI, automation and 21st century skills need. *Discussion Paper*, 1-14.

Azubuike, A. C (2022). Exploring the integration of sustainable materials in supply chain management for environmental impact. *Engineering Science & Technology Journal, 4*(3), 49-65.

Bartelsman E, Haltiwanger J, & Scarpetta, S. (2004). *Microeconomic evidence of creative destruction in industrial and developing countries*. Washington, DC: World Bank.

Bowles, J. (2014). The computerisation of European jobs. Bruegel blog. Retrieved from bruegel.org/2014/07/the-computerisation-of-european-jobs/. July 24.

Brzeski, C., & Burk, C. (2015) Die Roboterkommen: Folgen der Automatisierungfür den deutschen Arbeitsmarkt (he Robots are coming: Consequences of Automation for the German Labor Market). *INGDiBa Econ Res* (30), 1–7. German.

Chuah, L.L., Loayza, N.V. & Schmillen, A.D. (2018). The future of work: race with— not against—the machine. *Research & Policy Briefs from the World Bank Malaysia Hub*, (16), 1-4.

Deloitte, I. E (2024). Modeling organizational performance with machine learning. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(4), 177.

Deming, D, & Kahn, L.B (2018). Skill requirements across firms and labor markets: Evidence from job postings for professionals. *Journal of Labor Economics* (36): S, 337–S369.

Ebeh, M A (2019). The role of data analysis and reporting in modern procurement: Enhancing decision-making and supplier management. *International Journal of Management & Entrepreneurship Research, 6*(7), 2139-2152.

Echefuna, D E (2022). Comparative technical analysis of legal and ethical frameworks in AI-enhanced procurement processes. *World Journal of Advanced Research and Reviews, 22*(1), 1415-1430.

EY & NASSCOM (2017). *Future of jobs in India: A 2022 perspective*. Kolkata: Ernst and Young LLP.

Frank, R.M., Autorb, D., Bessenc, J.E., Brynjolfssond, E., I. (2019). Toward understanding the impact of artificial intelligence on labor. *PNAS Perspective*, 1-9.

Gaus, A. & Hoxtell, W. (2019). *Automation and the future of work in Sub-Saharan Africa.* Berlin: Konrad-Adenauer-Stiftung.

Jackson, K. (1993). The world's first motel rests upon its memories. *Seattle Times*. Retrieved from community.seattletimes.nwsource.com/archive/? April 25, date=19930425&slug=1697701.

Levy, F. (2018). Computers and populism: Artificial intelligence, jobs, and politics in the near term. *Oxford Review of Economic Policy* (34):3, 393–417.

Lowden, K., Hall, S., Elliot, D., & Lewin, J. (2011). *Employers' perceptions of the employability skills of new graduates Research commissioned*. London: University of Glasgow SCRE Centre and The Edge Foundation.

Masayuki, M. (2017). Who are afraid of losing their jobs to artificial intelligence and robots? Evidence from a survey. *RIETI Discussion Paper Series* (17), 69.

Mckay, C., Pollack, E.& Fitzpayne, A. (2019)**.** *Automation and a changing economy. Part I: The case for action.* Washington DC: Future of the Work Initiative, The Aspen Institute**.**

McKinsey Global Institute (2017). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*. Retrieved from: f%20Organizations/ What%20the%20future%20of%20work%20will%

Osoba, O. A. & Welser, W. (2017). *The risks of artificial intelligence to security and the future of work*. RAND Corporation, 1-23.

Oxford Economics. (2019). *How robots change the world what automation really means for jobs and productivity*. Oxford: Oxford Economics 1-64.

Pajarinen, M., Rouvinen, P., & Ekeland, A. (2015). Computerization threatens onethird of Finnish and Norwegian employment. *ETLA Brief* (34).

Petropoulos, G. (2017). *The impact of artificial intelligence on employment*. Brussels: Bruegel.

Samans, R. & Zahid, S. (2017). The future of jobs and skills in Africa: Preparing the region for the fourth industrial revolution. *World Economic Forum*, 14.

Scout, W (2024). Predictive analytics, operational efficiency and revenue growth in SMEs in Africa. *World Journal of Advanced Research and Reviews, 2024, 23*(03), 2281–2291

Tytler, R., Bridgstock, R., White, P., Mather, D., McCandless, T., & Grant-Iramu, M. (2019). *Jobs of the future*. Burwood: Deakin University.