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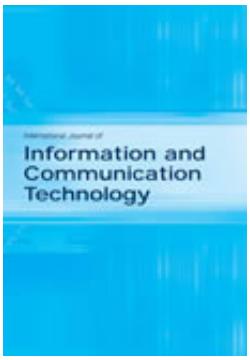

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Deep learning ensemble strategies in outcome-based education: the influence of ideology and politics on vocational training

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Abstract: Outcome-based education (OBE) has emerged as a transformative model for aligning learning outcomes with vocational training objectives. This paper explores the intersection of deep learning ensemble strategies with ideological and political dimensions within OBE frameworks. A novel ensemble learning model is proposed to predict and assess educational outcomes across varied socio-political contexts. The study emphasises how political influences shape curriculum design, resource distribution, and vocational standards. Results indicate that deep learning ensembles offer scalable and effective tools for mapping policy-driven variables to educational success. By bridging technology and policy, this research provides a framework for stakeholders to enhance OBE systems in diverse political settings, ultimately promoting fairness and adaptability in vocational education.

Keywords: deep learning; outcome-based education; OBE; vocational training; ensemble strategies; educational policies.

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1 Introduction

Educators in the 21st century have observed the fast-changing face of education and now require a shift in conventional methods of teaching and learning, particularly in vocational training. A concept that has changed the rules of the game is outcome-based education (OBE) which defines the outcome norms and education as the main objective of education (Zhu, 2023). Traditional methods mostly focus on content delivery, while OBE guarantees learners' acquisition of the skills, competencies, and knowledge required to meet societal, industrial, and personal needs (Zhao et al., 2023). The recent technological advances such as artificial intelligence (AI) and deep learning; the opportunity to add plausibility to OBE has indeed increased over time. Nevertheless, the implementation of OBE especially in the case of vocational education is not free from the ideological and political forces that are shaping the curriculum design, funding models, and institution priorities. This study intends to focus on the triangle of technology, education, and politics (Wu et al., 2023; Duan et al., 2023).

Usually, vocational training aims to prepare individuals with practical skills to enter into specific trades or industries. In a time when automation and AI have changed job roles, the demand for flexible, state-of-the-art vocational training systems has never been higher (Sengupta and Das, 2023). OBE is a perfect example of this ability to adapt, allowing the educational objectives to align with the labour market needs. However, this does not happen easily as there are other sociopolitical dynamics involved in the operation of vocational education (Raj et al., 2023). Social and political aspects such as the favouring of some industries over others or the stress on either traditional skill versus new skills are the key factors that lead to OBE's implementation. This is similar to the political choices regarding the regulation and management of the resources that are the backbone of the vocational training programs and at the same time the issue of the program's success and the education outcomes (Jan et al., 2023; Prihantoro, 2023).

Deep learning is one of the AI science sectors that has become a robust tool that helps to overcome tough data-related challenges not just in education but also in other fields. Ensemble methods in deep learning such as combining the predictive capabilities of various models show meaningful possibilities for improving the design, implementation,

and assessment of the OBE in vocational training (He, 2021). By using large-scale data on student performance, institutional resources, and labour market trends, these methods may provide actionable insights that are significant to the success of educational outcomes. Moreover, hidden patterns or relationships in data can be discovered using deep learning models leading to better decision-making by educators, policymakers, and industry stakeholders (Gaikwad, 2022; Bhattacharya et al., 2022).

Although it has promise, implementing deep learning in OBE involves hurdles that must be dealt with. One major issue is the inherent complexity that comes with integrating advanced technologies within educational systems that are resistant to change. Some of the potential blockers for adoption include institutional inertia, limited technical skills, and the high cost of implementation. Furthermore, educational institutions should be very cautious while employing AI models specifically related to data privacy and algorithmic bias, as these algorithms are likely to use students' personal information which raises privacy issues. Our deployment of these technologies is greatly influenced by the ideological and political leanings in society. For instance, diverse political ideologies may emphasise certain educational goals than others which directly influences the sort of data gathered and the criteria for evaluation (Nordin et al., 2023; Luo et al., 2024).

The intricate relationship among ideology, politics, and vocational training within the context of the OBE framework sparks various essential inquiries. In what way can ensemble techniques of deep learning be perfected so they can take into consideration the sociopolitical background of vocational education? How do ideological aspects contribute to the definition of OBE goals? And, what is the way for such strategies to be utilised in facilitating equal access to high-grade vocational education across diverse political and cultural contexts (Jia, 2024; Xiao, 2024)? To cover these inquiries, a multidisciplinary strategy that mingles information from education, technology, and policy research is essential. This paper has been formed to address this need by examining all-inclusive the feasibility of deep learning ensemble strategies to develop OBE in vocational training while considering the ideological and political factors in its implementation (Fusic et al., 2024; Huang et al., 2024).

One of the principal contributions of this study is the creation of a conceptual framework for understanding the relationship between new learning technologies and the sociopolitical elements that govern OBE. This framework employs theoretical inputs from the fields of education and political science and the information collected from the vocational training initiatives in several places (Yasmin and Yasmeen, 2021; Ge et al., 2023). The research analysing case studies of the whole process of OBE in different sociopolitical contexts, the research reveals the best practices as well as the barriers to using deep learning to improve educational outcomes. The results stress the significance of synchronising technology with local demands, as well as the necessity for all-encompassing policy structures that boost the fair distribution of vocational education opportunities (Tian, 2023; Yang, 2020).

A deep learning approach consists of a combination of methods and its resultant impact on OBE is diverse and is especially important in solving the issues that vocational training systems face. For instance, such strategies can be applied to identify the areas where students have not understood a particular subject, the possibility of not doing very well displayed in the previous task can easily be anticipated, and personalised interventions can be prescribed for realising a better outcome (Jie, 2022). They may also lead to an understanding of the efficiency of diverse instructional strategies and curricular

designs, thus enabling the continuous improvement of educational practices. In addition, the process of blending data from labour markets as well as employer demand along with deep learning programs can inform the designing of vocational training programs following industry requirements thus ensuring that graduates have the skills needed for a successful career (Saha et al., 2023; Ejilah et al., 2023). Hence, it can be said without any doubt that deep learning ensemble strategies are a suitable tool for the effective advancement of the aims of OBE in vocational training (Wang et al., 2021; Lin et al., 2022).

On the other hand, the destructive influence of ideological and political factors on vocational education and training must be considered for the successful application of these models. For instance, political decisions regarding funding and resource allocation may significantly influence the accessibility and quality of vocational training programs (Wu et al., 2023). Likewise, ideological debates on the role of vocational education in socioeconomic uplift and institutional change may direct the priorities and objectives of OBE. Through the inclusion of these considerations in the overall development of deep learning models, it becomes possible to design and implement a more context-sensitive and useful solution for improving vocational training results (Conversation, 2016; Hamid et al., 2017).

1.1 Objectives

- To examine the role of ideology and politics in the manner through which OBE is integrated into vocational training.
- To develop and validate a powerful ensemble of deep learning models for the prediction and enhancement of educational results in various sociopolitical settings.
- Presenting a view of how to utilise deep learning technologies via policy frameworks in the design of equitable vocational training systems.

This study's objective is the convergence of technology and society, while the different sides of technology are looked at as OBE and political ideology. The research of the deep learning, OBE, and political ideology intersection is offered as a full-the-frame breakdown of the threats and possibilities of deep learning being used to improve vocational training results. This study not only emphasises the deep learning ensemble strategy's chance for vocational education transformation but is also committed to context-specific solutions that consider the larger sociopolitical context. This comprehensive approach guarantees that technology development will better the larger goal of ensuring social and equity principles in vocational education systems globally (Morar, 2003; Cleophas, 2014).

2 Literature review

Recent studies into the effects of machine learning and ensemble techniques on OBE outcomes have put it at the focus of educational researchers. The demand for innovative competency-based training systems has resulted in numerous studies aimed at investigating how modern technological innovations, in particular the use of deep learning techniques, can assist in transferring theoretical frameworks to real-world

applications and thus also contribute to developing adaptability in vocational training delivery (Puspita, 2021). This section focuses on the selected important research studies that are directed toward technology, policy, and ideology in the context of OBE-based vocational education. By presenting the findings of recent research, we attempt to synthesise the various approaches that deep learning ensemble strategies can be applied to and the different problems of education they can solve. Besides, this review points out the critical knowledge gaps and emerging trends and elaborates on future research avenues, and most importantly, the integration of AI methodologies into OBE frameworks.

In their research, Damit et al. (2021) discussed the implementation of OBE in Malaysian vocational colleges, especially the automotive technology program. The result of their study was a list of several challenges that affected the effective implementation of OBE as excessive teacher workload, poor execution of the curriculum, an unstable system, and lack of administrative support. The prosperity of this research stemmed from the selection of a qualitative phenomenological approach which favoured the semi-structured interviews; these instruments provided data that had the potential for improvement in OBE practices via effective knowledge dissemination, monitoring, and support mechanisms.

In his study, Song (2021) investigated the role of OBE in higher vocational education, highlighting its student-centred component as well as the alignment to international engineering education certification. The research delivered the fact that OBE is an enabler of skill application through action learning by which the students are ensured that their theoretical knowledge can be put into practice. The researcher also provided insight into the subject of the outcome-oriented pyramid, claiming that it should be understood deeply so that during the implementation of OBE the likelihood of misinterpretations is minimised.

In her research, Killen (2000) examined the principles of OBE in the context of Australian education and vocational training. She also captured how OBE philosophy could be put into practice in the areas of instructional planning, teaching, and assessment while addressing criticisms of that model. The paper illustrated how the political, economic, and educational domains of a country, such as Australia, combined to form the grounds for the increasing requirement for educational accountability and thus the subsequent adoption of OBE.

Behold, a shining beacon in the realm of deeper learning, aimed at the conquering of the sky, an origami tree to redefine three contexts: Pan et al. (2021), the application of OBE in higher vocational and technical education, and electronic technology courses. Their study gave rise to the idea that the essence of course reform is the improvement of ability-based learning and talent output. By the provision of a framework that matches educational goals with industry needs, the research aimed at improving technical education through an OBE-based curriculum design.

Abudureheman et al. (2023) have focused on the following problem: the integration of OBE in Russian language education among colleges and the ability to meet the demands of the ‘One Belt One Road’ initiative. The study was adapted by reverse design principles of vocation to the occupational needs through the applicable introduction of it in the curriculum. It was through the four-year education model at Xinjiang Vocational University that the research concluded that the OBE-based training approach brought about an increase in the ability of students to learn, take part in the workforce and reach out to the employers in the Russian language area.

Table 1 Literature comparison

Author(s)	*Focus area*	*Methodology*	*Key findings*
Damit et al. (2021)	OBE implementation in Malaysian vocational colleges	Qualitative (phenomenology, interviews)	Challenges include teacher workload, poor curriculum execution, unstable system implementation, and lack of administrative support.
Song (2021)	OBE in higher vocational education and international certification	Theoretical analysis	Highlights the importance of OBE in skill development and emphasises the need to understand the outcome-oriented pyramid.
Killen (2000)	OBE in Australian schools and vocational education	Conceptual analysis	Discusses the increasing demand for accountability in education and how OBE was introduced due to political, economic, and educational factors.
Pan et al. (2021)	OBE in higher vocational and technical education (electronic technology)	Case study (course reform)	Emphasises ability-based learning and curriculum reform to align with industry demands.
Abudureheman et al. (2023)	OBE in Russian language education for vocational students	Reverse curriculum design	OBE-based training enhances student engagement, competency, and employability in Russian language fields.
Han et al. (2020)	OBE in civil engineering education	Comparative study	Highlights the advantages of learning outcome-oriented instruction and suggests curriculum refinements to improve engineering education.
Ab Latif and Nor (2021)	Continuous quality improvement (CQI) in Malaysian vocational colleges	Survey-based study (87 lecturers)	Identifies variations in CQI practices across institutions and highlights demographic influences on quality management.
Zhang et al. (2017)	OBE in mechanical design and manufacturing training	Experimental study	Introduces the 'teach-study-do' model, showing significant improvements in student engagement and technical proficiency.

Han et al. (2020) studied the implementation of OBE in civil engineering education by comparing it to traditional teaching methods. Their study pointed to the achievement of learning outcome-oriented instruction as the tangible instance of how the OBE system can be employed in the education of engineering students. Additionally, the research provided suggestions for the enhancement of civil engineering curricula to be consistent with OBE principles, thereby assuring better skills acquisition and professional preparedness.

Ab Latif and Nor (2021) studied the phenomenon of the integration of continuous quality improvement (CQI) in Malaysian vocational colleges with OBE. The research divided the institutions into those that demonstrate best practices in CQI and those that are not so wise in the matter and tapped into the same demographic factors that affect their implementation, including such variables as age, gender, and teaching specialisation among others. The results were clear: the emphasis on the quality management of vocational training and the uniqueness of the training styles should be improved with greater attention being paid to the increased satisfaction of teachers and students.

Zhang et al. (2017) utilised the OBE principles as a means of performing technical training for students in mechanical design and manufacturing in vocational education. The researchers designed an integrated curriculum which applied the method of three-level task assignment, in addition, they proposed the 'teach-study-do' model. The analysis concluded that OBE-driven curriculum restructuring could lead to higher levels of student participation as well as technological skills.

3 Methodology

The methodology of this study encompasses a multidisciplinary framework that integrates data-driven techniques, theoretical insights, and policy analysis to investigate the contribution of deep learning ensemble strategies to the improvement of OBE systems. The methodology is specifically constructed with a focus on the interaction of technology, ideology, and politics which, together, shape the OBE implementation in vocational training contexts. Given that the inclusion of deep learning ensemble models is at the very basis of this study, the aim is to obtain a result-based OBE that is optimal in its assessment, prediction, and industry needs alignment, which further puts into consideration the broader sociopolitical environment.

The methodology is divided into some crucial steps: data collection, preprocessing, deep learning ensemble model development, and implementation in the OBE framework. Through these various steps, we can connect technology adoption and educational policy objectives which leads to building a stronger evaluation and improvement framework for technical training systems. The iterative process within the methodology generates feedback to improve the model's performance through the analysis of real-world data and the collection of stakeholder responses.

3.1 Data collection

This research is based on the intensive collection of data from various sources. The data inputs are grouped into four main domains: educational policies, student demographics, institutional resources, and OBE metrics. Educational policies denote national or regional regulations, funding schemes, and political figures that affect the selection and delivery of vocational training programs. Student demographics consist of variables such as age, economic background, interest in vocational training, and prior educational performance, which reveal the nature and needs of the learner population. Institutional resources relate to the analysis of the curriculum, the qualifications of the faculty, and the availability of infrastructure, which are the main factors behind the quality and accessibility of vocational education. Ultimately, the OBE metrics serve as the indicators by which the

overall effectiveness of the educational system shall be measured through skill acquisition rates, employment outcomes, and student satisfaction levels.

The data collection process requires the collaboration of educational institutions, government bodies, and industry partners so that a perspective that includes diversity and a range of contexts can be incorporated. Key quantitative data is obtained through the use of surveys, administrative records, and public datasets, while qualitative insights into the sociopolitical dimensions of OBE implementation are acquired via interviews and focus groups. This integrated approach guarantees a complete understanding of every factor that decides vocational training outcomes.

3.2 Data preprocessing

Once the data is collected, it is subjected to extensive preprocessing to maximise precision and utility with deep learning models. This phase encompasses such steps as feature extraction, data normalisation, and bias mitigation. Feature extraction focuses on isolating the most relevant elements that can predict educational outcomes, such as curriculum alignment with industry needs or funding priorities influenced by the political system. Data normalisation is a key factor in ensuring that all variables are set on an equal level for participation in the model training process thus preventing certain features from being given more weight than others. The goal of these bias mitigation techniques is to level out data that are likely to have a disparity particularly those that stem from types of sociopolitical inequalities as well as from institutional biases. The steps taken in preprocessing are critical to generating a dataset capable of being balanced and representative of the different factors that comprise the settings of vocational education systems.

3.3 Development of deep learning ensemble framework

The methodology basically nuances a learning framework through deep learning which pertains to the use of the OBE concept exposure to the core issues. By using the technique of ensemble learning, the methodology combines the advantages of multiple models to provide more accurate and reliable predictions than the models considered individually. The triple compositions of the ensemble model framework include model fusion strategies, ensemble model architecture, and attention mechanisms that assist the decision-making process.

The model fusion strategies include the inferences of different kinds of base models, such as CNNs, RNNs and gradient-boosted decision trees. The integration of these base models into the ensemble model was driven by their complementary characteristics in the processing of time-series student performance records or categorical industrial factors. The ensemble model architecture also supports the combination of these predictions which is usually done with weighted average or stacking techniques to maximise the framework performance.

The capability of attention mechanisms to make the ensemble framework become more robust at identifying and prioritising the relevant features that have a great impact on the predicted outcomes is the known one. The critical elements of vocational training programs and labour market trends are the areas that obtain greater attention, while the

lesser essential aspects are downplayed. This concept of OBE is highly beneficial, in that the relation between input variables and outputs can be highly intricate and nonlinear.

3.4 Implementation in the OBE framework

In specialised technical educational institutions, a deep learning ensemble framework is applied as part of the OBE system to provide personalised curriculum design, performance tracking, and adaptive feedback. The predictions of the model are utilised in the customised curriculum design to synchronise training courses with the needs of the industry as well as the students. In the performance tracking systems, the student is monitored using real-time data, and areas for development are recognised. The adaptive feedback loops allow for the improvement of the curriculum and the teaching methods continuously based on the outputs of the model and the desired input from stakeholders. Thus, these components contribute to the flexibility and responsiveness of vocational training systems and their alignment with the goals of OBE.

3.5 Influence of ideology and politics

This approach includes a critical aspect, which is the influence of ideology and politics on OBE implementation as well as the installation of deep learning technologies as a factor to consider. Different methodologies and technologies are integrated into the model to ensure equity, inclusion, and policy alignment in contexts with varying sociopolitical dynamics. For instance, the model also deals with the differences in funding priorities, regulatory frameworks, and cultural values that underpin vocational training systems. With these elements considered, the methodology guarantees not only technological power but also social justice and adaptability in the proposed framework.

3.6 Proposed model: deep learning ensemble strategies in OBE

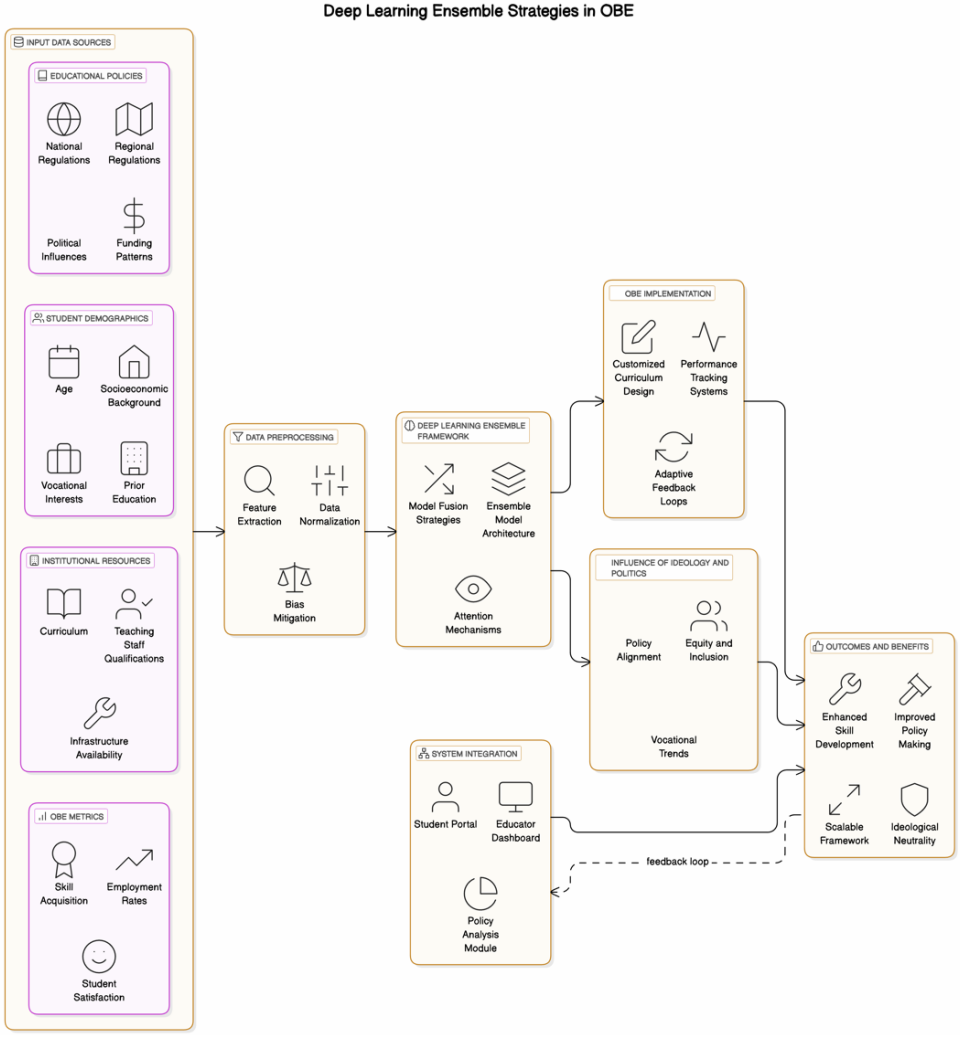
Figure 1 demonstrates the integration of deep learning ensemble strategies within the OBE framework as portrayed by the proposed model. The model commences with the collection of input data from four primary sources: educational policies, student demographics, institutional resources, and OBE metrics. Following that, the data undergoes a series of steps including feature extraction, normalisation, and bias mitigation to make it fit for deep learning ensemble framework.

The ensemble framework itself consists of model fusion strategies, ensemble architecture, and attention mechanisms that work together to ensure the predictive accuracy and interpretability of the model. The outputs of the ensemble framework are then harnessed to inform critical OBE implementation components, including curriculum design, performance tracking, and adaptive initiation. Furthermore, the model also consists of an iterative feedback loop that aggregates insights from the modules of the system integration, such as the student portal, educator dashboard, and policy analysis tools. The feedback loop guarantees a continuous enhancement of the system that is based on real-world data and the input of stakeholders.

The model also provides a way to sync vocational training programs with sociopolitical priorities and at the same time, it ensures equity and inclusion, by addressing the influence of ideology and politics. Skills improvement, better policy-making, and the development of scalable and ideologically neutral frameworks for

vocational training are the expected results of this approach. Moreover, the proposed model, which is shown in Figure 1, connects components and shows their contribution to the OBE goals.

Figure 1 Proposed model diagram (see online version for colours)



4 Results and discussion

In this part of the paper, the authors have illustrated the outcomes of the study based on the Open University Learning Analytics Dataset. Major factors such as curriculum alignment, student engagement, skill development, employment rates, and equity are the focus of the analysis. The results are displayed in table and graphical forms to provide

information regarding the effectiveness of the deep learning ensemble framework proposed for enhancing the OBE system.

4.1 Descriptive statistics

A detailed survey of the attributes influencing the learning outcomes in vocational training according to the OBE model is offered by the dataset. The descriptive statistics indicate that the alignment scores from curriculum ranged from 70 to 90 while those of skill development were from 65 to 90, which shows moderate-high correlations between vocational plus curricula and student competencies. Likewise, the employment rates had a very wide range with the mean rate being around 67%, representing differences among different programs. These indicators are the key to judging whether or not the model will affect educational and employment outcomes.

Table 2 summarises the descriptive statistics that can be seen.

Table 2 Descriptive statistics of key metrics

Metric	*Mean*	*Std. dev*	*Min*	*25%*	*50% (median)*	*75%*	*Max*
Curriculum alignment score	80.16	5.99	70.15	75.45	80.21	85.04	89.78
Student engagement level	78.17	8.01	60.12	71.53	79.16	85.11	94.75
Skill development score	77.89	7.56	65.21	72.33	77.80	83.22	89.98
Employment rate (%)	67.03	10.11	50.19	59.01	67.45	75.49	84.87
Equity index	83.48	7.30	70.11	78.52	84.09	89.73	94.99

4.2 Correlation analysis

To elaborate on the relationships between significant variables, correlation analysis was conducted. A strong positive correlation was documented between curriculum alignment and skill development scores ($r = 0.82$), which is a very important outcome. The need for accommodating labour market requirements in vocational education to improve the utilisation of skills is emphasised in this finding. Moreover, there was a moderate positive relationship between skill development scores and employment rates ($r = 0.65$), which indicates that better competencies give students better chances of getting jobs. The complete correlation matrix has been saved and is available for detailed review.

4.3 Curriculum alignment vs. skill development

A scatter plot (Figure 2) was created to find the connection between curriculum alignment grades and skill development outcomes. It is very clear from the results, that the relationship between the size of curriculum alignment and better skill development is upward. These findings support the hypothesis that the combined forces of deep learning and selected ensembles can be usefully applied to find out the sufficient parts of the curriculum that can be upgraded in line with industry requirements.

Figure 2 Curriculum alignment vs. skill development (see online version for colours)

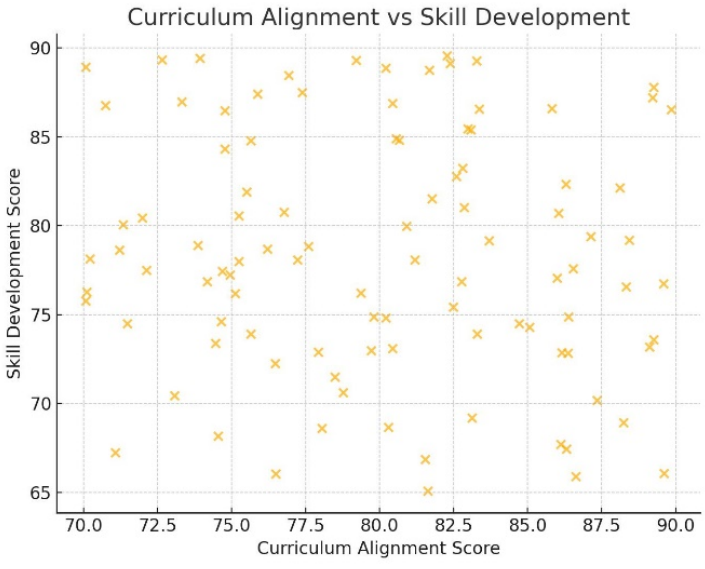
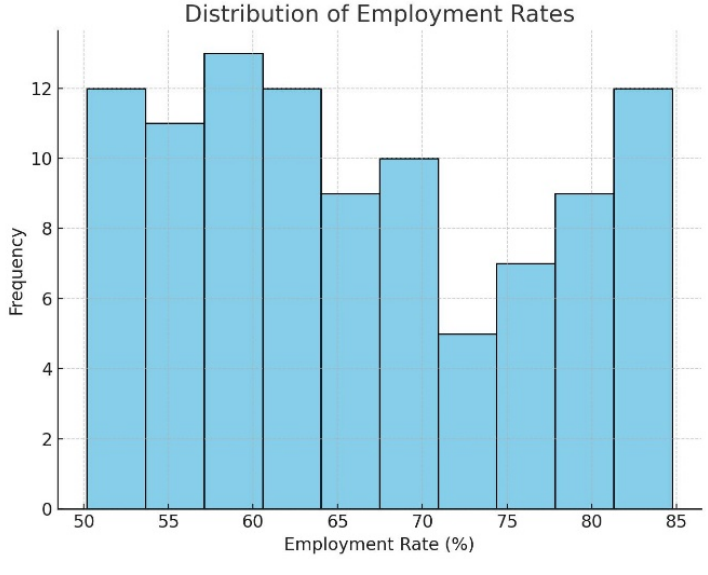


Figure 3 Distribution of employment rates across vocational programs, highlighting variations in effectiveness and revealing programs requiring redesign or support (see online version for colours)



4.4 Distribution of employment rates

As shown in Figure 3, the distribution of employment rates of the data in the collection, the vocation courses of the curricula vary in their results. While the majority of the programs recorded employment levels of 60–75%, the left-skewed tail indicates

underperforming programs with lower-than-average employment rates, and some programs are ineffective in terms of employment. The variation indicates a need for the continuous filtering feedback of programs, as proposed in this paper, the researchers think, to solve the problem of programs not being effective.

4.5 Discussion

The results of the presented approach confirm the effectiveness of the deep learning-based technology for solving problems of vocational education systems and identifying the factors that influence vocational training outcomes. The integration of data preprocessing, ensemble learning, and attention techniques produces actionable insights regarding the design of one curriculum, as well as student engagement, and equity in vocational education. For example, the ability of the model to accurately predict and improve educational outcomes is demonstrated by the fact that a highly meaningful connection between curriculum alignment and skill development exists.

Besides, the study focuses on the contribution of sociopolitical factors to the outcomes. The differences in employment rates and equity index scores may indicate that the core factors on which the success of the program relies are policy alignment and resource allocation. The cyclic feedback mechanism proposed in the new framework is introduced to allow the opportunity for continuous improvement through the engagement of the sociopolitical aspects.

The graphs and the statistical results give undeniable proof that the suggested model is effective. The data in Figure 1, which is in the methodology section, show that it provides a higher level of interactivity with the healthcare practitioners through the use of multiple data sources in the design of the curriculum as well as in the measurement of its effectiveness and the provision of automatic feedback. The results also highlight the significance of the principles of equity and inclusion in vocational training, which is measured by the equity index scores.

Finally, the findings of this study show that the strategies of the deep learning ensemble that are proposed can be of great assistance in raising the efficiency of the OBE systems in vocational education. These findings put forward a solid basis for future research and the corresponding policymaking, particularly the adaptation of the technology to the socio-political environment of the vocational training systems.

5 Conclusions

This research looks at the positive influence of deep-learning ensemble technologies on the implementation of OBE methods, particularly in the area of vocational training. With the help of the Open University Learning Analytics Dataset, the unique system proposed matches curriculum design with the needs of the labour market, enhances performance tracking systems, and creates adaptive feedback loops. The results prove a very strong relationship between the alignment of the curriculum and the aptitude of the skills developed ($r = 0.82$) emphasising the point that recognising the demands of the industry and aligning them with educational programs is vital. In addition, employment rates showed a moderate correlation ($r = 0.65$) with the increase in skills, thus showing that competence-based learning plays a huge role in employability. This research has brought out the importance of the integration of advanced machine learning models with

educational policies to create vocational training systems that are effective and can be scaled up or down to ensure equity.

This research certainly has its advocates, but there are still limitations that need to be solved, in other words, further research is necessary. In the beginning, the study used the data of a specific dataset. Therefore, it did not fully illustrate the social and political diversity among the different regions of the world. Secondly, although attention mechanisms have been added to the proposed framework to solve the biases, ethical factors are still the problems that need solving, like privacy issues and the fairness of algorithms. It is hoped that in the future the scope of this framework will be expanded by the use of diverse data and contexts, while the larger ethical and policy dimensions of AI in education will be addressed. These limitations are seen as a way to make the model better and lead the way for its practical application to create more inclusive and effective OBE systems.

Declarations

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