Leveraging Artificial Intelligence Applications as Catalysts for Management of Training Programs in Technical and Vocational Training in Nairobi County, Kenya

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Abstract: *Learning institutions have started using artificial intelligence applications to enhance the management of training programs. However, many technical and vocational training institutions in Nairobi County face challenges such as low trainee engagement, difficulties with industrial attachments, wasted instructional time, and poor communication. Therefore, this study aimed to explore how artificial intelligence applications can serve as catalysts for managing training programs in public TVETs in Nairobi County, Kenya. The research employed a mixed methodology, utilizing a concurrent triangulation design. The target population included 4,080 respondents, consisting of 36 Deans of Schools, 180 Heads of Departments, 407 tutors, and 3,457 trainees, from which a sample of 364 respondents was calculated using Yamane's Formula. Qualitative data were analyzed thematically according to the study's objectives and presented in narrative form. Quantitative data were analyzed descriptively with frequencies and percentages and inferentially using Pearson's Product Moment Correlation Analysis in SPSS 26, with results displayed in tables. The study found that the management of training programs in public TVETs faces numerous challenges, including low trainee engagement, issues with industrial attachments, wasted instructional time, and ineffective communication, all contributing to low completion rates. To address these issues, TVETs have started to adopt artificial intelligence applications. However, the findings indicate that significant improvements in the management of training programs have yet to be realized. Therefore, the study recommends that TVETs should continue investing in artificial intelligence tools aimed at enhancing planning and managing trainee preparation activities.*

Keywords: *Artificial intelligence applications, Catalysts, Management of training programs, Technical and vocational training institutions*

1. Introduction

Training plays a vital role in the realization of goals of education across the world. Rejjak, Mrinal and Tapash (2018) posit that tutors directly put theoretical knowledge into educational practice and the moral quality, cognitive level, and creative thinking ability of learners not only depend on the curriculum and textbooks, on the learning environment, but also on their

quality and personality. Cognizant of these assertions, the kind of training students receive and management of such training programs is paramount. According to Anusri and Anindya (2022), management of training programs entails a set of activities carried out by learning institutions to ensure that trainees are equipped with necessary skills, knowledge as well as pedagogical strategies to facilitate effective learning in diverse educational settings. These activities range from

planning, implementation, and evaluation as well as continuous improvement of training initiatives for trainees. However, management of such training programs has not been devoid of challenges.

In Mexico, for instance, a survey undertaken by Hamann, Sánchez and Lopez (2019) assert that close to 45.9% of trainees still registering low grades in their formative or summative tests, slow placement of trainees for industrial attachment, instructional time wastage and ineffective communication between trainee and tutors. In the same token, in Brazil, an assessment undertaken by Silva, Oliveira and Santos (2022) noted that management of training programs has had numerous challenges. According to Silva et al (2022), only 45% of trainees score above the national average, only 60% of trainees are placed in industrial attachment within the designated timeframe. In some instances, Silva et al (2022) found that delays in placements can extend beyond six months, significantly impacting the trainees' readiness for the workforce and diminishing their practical skills. In the words of Pereira (2023), 50% of trainees report difficulties in collaborating with peers and tutors, primarily due to unclear communication channels and a lack of structured feedback mechanisms.

To mitigate these challenges, learning institutions have leveraged artificial intelligence (AI) applications. Harris and Lee (2023) suggest that artificial intelligence (AI) involves using computer systems to carry out tasks that typically need human intelligence, including visual perception, speech recognition, decision-making, and language translation. Artificial intelligence (AI) applications are specific tools that enable AI to perform various functions in different environments including education. This supports the arguments of Martinez and Cummings (2023) that AI is a transformational technology that replicates human intelligence to learn. In Kenya, Technical and vocational training institutions (TVETs) have embraced artificial intelligence applications as a strategy for improving management of training programs. However, in TVETs found in Nairobi County, management of training programs have had challenges with low trainees' learning, challenges with industrial attachment, wastage of instructional time and ineffective communication. A report authored by the Ministry of Education (2023) indicated that trainees' performance is low with quite a number of the trainees scoring below 60%, insufficient mentorship and limited opportunities for hands-on experience in real classroom settings during industrial attachment. This corroborated the findings of a report by Global Education Monitoring Report (2022) which showed that up to 30% of class time is lost due to poor planning and management. Despite these assertions, much is yet to be done to examine how leveraging artificial intelligence applications act as catalysts for management of training programs in technical and vocational training institutions, hence the study.

2. Literature Review

With the growing incorporation of technology into education, Johnson and Adams (2022) postulate that AI has become a strong force, enhancing the effectiveness and efficiency of training programs. The development of artificial intelligence has ushered in a new era in educational administration, particularly in training programs. To support this view, Rogers, Smith, and Thompson (2022) point out that technical and vocational training schools, which have the mandate of preparing students for the future, are faced with numerous challenges, including evolving standards of education, heterogeneous student populations, and limited resources. In addressing these problems, the application of artificial intelligence technologies introduces new solutions to training program management improvement. According to Rogers et al. (2022), such applications comprise, among others, data analytics, Intelligent Tutoring Systems (ITSs), Learning Management Systems (LMSs), and automated grading tools (AGTs). These observations inform us that AI solutions make an enormous difference in the management of training programs by facilitating intricate administrative tasks and the allocation of resources smoothly.

Johnson and Smith (2021), for example, note that AI-powered platforms in the United States have the capability of automating schedules, student assessments, as well as data analysis, consequently decreasing faculty workload while allowing educators to concentrate on how to advance pedagogy. The need for such efficiency is most pronounced in big organizations, where resource management would otherwise be complex and tedious.

Weber, Schmidt, and Müller (2021) in their study in Germany believed that artificial intelligence systems are now being applied more to assess the effectiveness of training programs. Through the monitoring of data on trainee performance and learning outcomes, the systems provide real-time feedback that is used to further streamline training curricula. Weber et al. (2021) maintain that this analytical capacity guarantees the alignment of training with the latest educational requirements and facilitates an effective reaction to emerging pedagogical issues. In simple terms, AI tools' utilization enhances personalized learning experiences that cater to the diverse needs of learners.

In China, Li, Zhang, and Cheng (2022) observe that AI applications have registered encouraging results in tailoring learning content to individual performance levels and learning styles, with learning institutions embracing the customized strategies in a bid to enhance trainee efficacy and flexibility in pedagogy, leading to increased student engagement. In most nations in Sub-Saharan Africa, AI is starting to revolutionize training with personalized learning pathways. For example, in Nigeria, Ademola and Okwudire (2022) write that

artificial intelligence systems can detect knowledge gaps among trainees and suggest specific resources, which in turn facilitates skill development and enhances pedagogy. In summary, these findings stress the need for the incorporation of AI technologies in training, showing their imperative in propelling management efficacy, curriculum innovation, individualized learning, and the overall quality of learning outcomes.

In Kenya and Nairobi County, artificial intelligence has been integrated in most technical and vocational training institutes and utilized in various training programs. As per Mutai, Owino, and Njeru (2023), the utilization of AI-based platforms allows trainees to access personalized training content, thereby improving their teaching abilities and methodologies. These technologies have enabled colleges to facilitate data analysis, enabling education authorities to identify training needs and monitor progress effectively. Additionally, AI tools streamline administrative tasks, allowing for more efficient allocation of resources and time management. However, management of training programs have still had a multiplicity of challenges.

2.1 Theoretical Framework

This study is based on the theory of Artificial Intelligence (AI), which was proposed by John McCarthy in 1960. He envisioned a future where machines could mimic human intelligence through logical reasoning and problem-solving skills. A fundamental aspect of this theory is the idea that human intelligence can be represented using symbols, with reasoning processes that involve manipulating these symbols. McCarthy saw AI as the development of machines capable of performing tasks that typically require human thought, such as planning, problem-solving, and learning. He promoted the use of formal logic to represent knowledge and reasoning, believing that this logic-based approach would enable machines to tackle complex decision-making tasks through both deductive and inductive reasoning. According to McCarthy, an AI system should be able to operate independently and make rational decisions. This implies that it would rely on reasoning processes to make choices without needing constant human oversight, using data to draw conclusions that enhance its actions and objectives. While McCarthy initially concentrated on symbolic AI, he recognized the significance of learning systems in the field. AI systems that learn from their experiences, adapt, and enhance their performance over time are now seen as essential to the future of AI, a concept that has become fundamental in modern machine learning. In McCarthy's framework, AI systems would represent knowledge in a way that is understandable and usable for machines. This representation of knowledge enables AI to reason and make well-informed decisions, a capability that has since been incorporated into machine learning and knowledge-based systems.

In this study, the theory highlighted the importance of AI in managing and optimizing training programs within Technical and Vocational Education and Training (TVET) institutions. AI-driven systems, based on McCarthy's principles, can significantly improve the effectiveness and efficiency of TVET programs by automating administrative tasks, personalizing learning experiences, and assessing student performance. For example, AI algorithms can evaluate data on student progress and recommend customized training paths that align with each learner's strengths and weaknesses. This approach ensures that students engage with the most relevant content, ultimately enhancing their learning outcomes. Additionally, AI can facilitate real-time performance monitoring, pinpointing areas where students may need support and providing timely interventions. Instructors can leverage AI tools to organize training schedules, evaluate the quality of instructional materials, and enhance communication between students and trainers. The ability of AI to process large volumes of data enables better resource allocation, making TVET programs more adaptable to the changing demands of the workforce.

3. Methodology

This investigation adopted a mixed methodology and applied a concurrent triangulation research design. This was suitable since this study involved the collection and analysis of both quantitative and qualitative data in a single study.

According to Creswell (2018), in the quantitative method, the researcher asks specific questions and collects quantifiable data from a large number of participants. To implement this approach, the study employed concurrent triangulation design which is a single-phase design which allowed the researcher to use the quantitative and qualitative methods during the same timeframe and with equal weight. The target population consisted of 4,080 respondents, including 36 Deans of Schools, 180 Heads of Departments, 407 tutors, and 3,457 trainees from which a sample of 364 respondents was determined using Yamane's Formula. Stratified sampling was employed to create 36 distinct strata based on the number of public universities in Nairobi County. From each university, the Dean of Schools, two HoDs and 3 lecturers were selected using purposive sampling. However, from each university, at least four teacher-trainees were selected using simple random samples to avoid bias.

This sampling procedure resulted in a sample of 36 Deans of Schools of Education, 72 HoDs, 108 lecturers and 148 teacher-trainees. Quantitative data were collected from trainees using questionnaires whereas interviews were used to collect qualitative data from Deans of Schools, Heads of Departments and tutors. Qualitative data were analyzed thematically based on the objectives and presented in narrative form. Quantitative

data were analyzed descriptively through frequencies and percentages and inferentially using Pearson's Product Moment Correlation Analysis in Statistical Packages for Social Science (SPSS 26), with results presented in tables.

4. Results and Discussion

This section presents the findings of the study based on the objective. It also outlines the methods of presentation of the study findings and discussions.

4.1 Response Rates

In this study, 148 questionnaires were administered to trainees out of which 134 were filled and returned. The researcher also interviewed 30 Deans of Schools, 61 Heads of Departments and 96 tutors. This yielded response rates shown in Table 1.

Table 1: Response Rates

Respondents	Targeted	Participated	Return Rate (%)
Deans of Schools	36	30	83.3
Heads of Departments	72	61	84.7
Tutors	108	96	88.9
Trainees	148	134	90.5
Total	**364**	**321**	**88.2**

Source: Field Data (2025)

Table 1 indicates that Deans of Schools had a response rate of 83.3%, Heads of Departments achieved 84.7%, tutors reached 88.9%, and trainees recorded a response rate of 90.5%. This resulted in an average response rate of 88.2%, aligning with Creswell's (2014) assertion that a response rate exceeding 75.0% is sufficient. In the same token, Kothari (2005) also indicated that the acceptable response rates in research should be between 60-70% for results to be valid and reliable. This data was crucial as it enabled the researcher to generalize the study findings to the target population.

4.2 Status of Management of Training Programs in Public TVETs

The study sought to assess the status of management of training programs in public technical and vocational training institutions. This was measured by collecting data on trainees' performance, planning of industrial attachment, reduction in wastage of instructional time as well as communication and collaboration. Descriptive data were collected from trainees and results are shown in Table 2:

Table 2: Trainees' Views on the Status of Management of Training Programs in Public TVETs

Test Items	Ratings		
	Good %	Fair %	Below Average %
Performance of trainees	13.9	35.2	50.9
Planning of industrial attachment	38.9	25.0	36.1
Reduction in wastage of instructional time	18.5	48.2	33.3
Communication and collaboration	44.4	35.2	20.4

Source: Field Data (2025)

Table 2 shows that 68(50.9%) of the trainees stated that the performance of trainees has been below average, 47(35.2%) indicated that fair whereas only a paltry 19(13.9%) stated that performance has been good. In the same token, 52(38.9%) of the trainees indicated that planning of industrial attachment has been good, a quarter, 34(25.0%) stated fair whereas 48(36.1%) indicated below average. On instructional time, most of the trainees, 65(48.2%), stated that there have been fair efforts to reduce wastage of instructional time, a third, 45(33.3%) stated below average whereas 24(18.5%) noted that reduction of wastage of instructional time has been good. The study also found that 59(44.4%) of the trainees noted that communication and collaboration has been good, 47(35.2%) stated fair whereas 28(20.4%)

noted that it has been below average. During the interviews, the Deans of Schools, Heads of Departments and tutors responded in favour of the view that management of training programs has been full of challenges. On further probing, Dean of School, DS1, noted:

> *In my institution, there have been challenges with management of training programs. This has caused low performance of trainees in formative and summative assessments, ineffective planning of industrial attachment sessions, wastage of instructional time as well*

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as ineffective communication and collaboration.

These findings are consistent with the study by Smith and Jones (2022) which pointed out barriers in the management of training programs, which greatly affected the performance of the trainees on both Formative and Summative assessments. This has led to ineffective industrial attachment sessions with trainees being unable to meet the expected pedagogical requirements (Brown, 2021). There are also issues regarding the ineffective use of instructional time which is often associated with ill-prepared curriculum timetables and lack of supervision during industrial attachments (Nguyen, 2023). In addition, there is minimal engagement and interaction from stakeholders in training programs which has led to a fragmented method of curriculum delivery and assessment (Adams and Green, 2022). These problems pose a serious challenge to the achievement of training objectives and as a result the quality of teaching in schools and the development of future teachers is adversely affected. The findings show that training programs have failed to address so many issues and that has led to a lack of motivation from trainees. Of great concern is the poor administration of these programs which has produced unsatisfactory progress in both the formative and summative evaluations.

Most trainees find it hard to attain the expected levels due to the absence of effective instructional methods, adequate feedback, and appropriate assistance. In addition, unskillfully executed industrial attachment sessions have contributed towards a disconnection of concepts learned in class and practical application of those concepts. Consequently, trainees enter classrooms without the necessary preparation that may hinder their ability to actively involve students in learning. The inappropriate organization and execution of the training program is also a new yet important area that has led to the loss of a great deal of useful teaching time. When there are hardly any plans to guide the training activities, trainees are actually highly unlikely to have enough time to exercise their skills which will usually result in misuse of the funds. Also, the lack of proper coordination among these institutions and the mentors and trainees tend to result in an absence of clarity and therefore missed opportunities for working together. These challenges make it impossible to create a comprehensive pedagogical approach which makes it more difficult to develop the necessary competencies for the trainees. Lastly, it is important to invest more in management, planning and communication to the institution because the performance of the trainees and the quality of education will improve significantly over time.

4.3 Use of Artificial Intelligence and Management of Training Programs in Public TVETs

The study examined how leveraging artificial intelligence applications acts as catalysts for management of training programs in public TVETs. Descriptive data were collected and results are presented in Table 3;

Table 3: Trainees' Views on Influence of Artificial Intelligence Applications on Management of Training Programs in Public TVETs

Test Items	Ratings				
	SA %	A %	U %	D %	SD %
Use of data analytics has improved management of training programs in public TVETs	51.9	11.6	5.6	5.6	25.3
To improve management of training programs in TVETs, tutors have sometimes adopted use of learning management systems (LMSs) form of AI	54.2	14.4	5.6	11.6	14.4
In public TVETs, tutors rarely use intelligent tutoring systems as a way of improving management of training programs	57.9	9.3	7.4	9.3	16.2
By adopting automated grading tools form of AI, management of training programs in public TVETs has improved	48.2	8.8	5.6	20.8	16.7
Though useful, many public TVETs have not fully adopted use of artificial intelligence applications to improve management of training programs	66.7	11.3	3.3	5.4	13.5

Source: Field Data (2025)

Table 3 indicates that 69 trainees (51.9%) strongly agreed that the use of data analytics has enhanced the management of training programs in public TVETs, while 16 trainees (11.6%) agreed, 8 trainees (5.6%) were

undecided, 8 trainees (5.6%) disagreed, and 33 trainees (25.3%) strongly disagreed. The study also found that 73 trainees (54.2%) strongly agreed that tutors have occasionally utilized learning management systems (LMSs) as a form of AI to improve the management of training programs in public TVETs, with 19 trainees (14.4%) agreeing. However, 8 trainees (5.6%) were undecided, 16 trainees (11.6%) disagreed, and 19 trainees (14.4%) strongly disagreed. Additionally, the study established that 78 trainees (57.9%) strongly agreed that tutors in public TVETs rarely use intelligent tutoring systems to enhance the management of training programs, while 12 trainees (9.3%) agreed, 10 trainees (7.4%) were undecided, 12 trainees (9.3%) disagreed, and 22 trainees (16.2%) strongly disagreed. Furthermore, 65 trainees (48.2%) strongly agreed that the adoption of automated grading tools as a form of AI has improved the management of training programs in public TVETs, with 12 trainees (8.8%) agreeing. At the same time, 8 trainees (5.6%) were undecided, 28 trainees (20.8%) disagreed, and 21 trainees (16.7%) strongly disagreed. Notably, two-thirds of the trainees, totaling 89 (66.7%), strongly agreed that, despite their usefulness, many public TVETs have not fully embraced the use of artificial intelligence applications to enhance the management of training programs, while only 16 trainees (11.6%) agreed, 5 trainees (3.7%) were undecided, 8 trainees (5.6%) disagreed, and 16 trainees (12.5%) strongly disagreed.

The results suggest that AI applications such as data analysis, learning management systems (LMS), intelligent tutoring systems (ITS), and automated grading software tools have very strong potential. However, they are underutilized across a large number of educational institutions. This corresponds with Cope and Kalantzis' (2016) study findings that AI technologies can enhance educational productivity and efficiency, tailor learning processes, and provide analytics on student performance, but numerous higher learning institutions find it difficult to integrate these technologies into their training programs. This gap has dire consequences for both trainee productivity and student learning outcomes. Moreover, these results also lend credence to the statements by Nye (2015) that AI based training systems can greatly enhance learning efficiency by providing targeted feedback and identifying poor performance areas, but the absence of these systems has, unfortunately, hindered the development of more effective trainee programs. Such reluctance to adopt new technologies greatly limits training and education programs and equally stagnates the development of tertiary vocational education institutions in this digital age.

Ultimately, these findings support the claim that the lack of AI tools has inhibited the creation of training programs that would have to rely heavily on these AI tools. Many TVETs still rely on traditional methods of assessing trainee effectiveness and student progress, failing to leverage AI's potential for real-time feedback and improvement. Most universities still use basic LMS platforms that lack intelligent features, limiting opportunities for trainees to grow in a dynamic, data-driven environment. This indicates that the underuse of AI in technical and vocational training institutions stifles progress in training, preventing educators from reaching their full potential and impacting the quality of education.

4.5 Inferential Analysis

To further verify how leveraging artificial intelligence applications act as catalysts for management of training programs in public TVETs, data were collected from a sample of 10 Deans of Schools on how often (Very Often = 5, Often = 4, Sometimes = 3, Rarely = 2 and Never = 1) they use AI applications and the average performance of trainees in end-year examinations for the last three year (2021 to 2023). Results are shown in Table 4:

Table 4: Frequency of Use of Artificial Intelligence Applications in Public TVETs and the Average Performance of Trainees in End-year Examinations

Frequency of Use of Artificial Intelligence Applications in Public TVETs	Average Performance of Trainees in End-year Examinations
3	72
1	34
2	53
3	65
3	70
2	58
5	81
4	90
3	76
2	56

<div align="center">Source: Field Data (2025)</div>

Table 4 indicates that the higher the number of times technical and vocational training institutions use artificial intelligence applications, the higher the performance of trainees in end-year examinations. This

further indicates that frequent use of AI is key in improving management of training programs in technical and vocational training institutions manifested in performance, improved planning of industrial attachments as well as effective communication and collaboration. This implies that artificial intelligence (AI) applications are transforming the way technical and vocational training institutions manage training programs. By frequently using AI tools, universities can streamline administrative processes, improve recruitment strategies, and tailor training courses to the specific needs of educators. Predictive analytics helps institutions identify skill gaps early, while machine learning models provide personalized learning paths for trainees. Automated scheduling and resource management enhance efficiency, reducing costs and time wastage. The more frequently these AI applications are adopted, the better the coordination and outcome of training initiatives. Thus, widespread implementation of AI is essential for adapting to the dynamic demands of modern education systems. These results were run through Pearson's Product Moment Correlation Analysis. Results are displayed in Table 5:

Table 5: Relationship between Frequent Use of Artificial Intelligence Applications and Management of Training Programs in Public TVETs

		Frequent Use of Artificial Intelligence Applications in Public TVETs	Management of Training Programs
Frequent Use of Artificial Intelligence Applications in Public TVETs	Pearson Correlation	1	.670[*]
	Sig. (2-tailed)		.034
	N	10	10
Management of Training Programs	Pearson Correlation	.670[*]	1
	Sig. (2-tailed)	.034	
	N	10	10

Table 5 shows that there exists a significant relationship between frequent use of artificial intelligence applications and management of training programs in technical and vocational training institutions ($r(10)$ = 0.670, p = 0.034 at α = 0.05). In other words, the higher the number of times technical and vocational training institutions leverage use of artificial intelligence applications, the effective the management of training programs. This further indicates that, by frequently leveraging AI tools, there is optimization of administrative operations, enabling more efficient scheduling, data analysis, and participant monitoring, ultimately enhancing training program effectiveness. Through personalized learning platforms, AI also supports tailored professional development for educators, addressing their unique strengths and weaknesses. Additionally, these technologies streamline resource allocation and ensure real-time feedback, fostering continuous improvement. While challenges like digital literacy disparities remain, leveraging AI's capabilities can elevate the overall quality and inclusivity of training programs, significantly transforming how technical and vocational training institutions deliver their educational strategies.

4.6 Thematic Analysis

During the interviews, the Deans of Schools, heads of departments and tutors responded in favour of the view that use of data analytics has improved management of training programs. However, they disagreed with views expressed by many trainees that tutors only sometimes use learning management systems (LMSs) form of AI while teaching. Tutor, T1, stated:

> *It is a requirement that all tutors should embrace use of technology and I always hold online classes at all times to ensure that all students are reached regardless of where they are.*

They also responded on contrary with the regard to the view that tutors rarely use intelligent tutoring systems and automated grading tools as a way of improving management of training programs. Though contradictory, these views affirm the key roles of AI applications in the management of training programs in technical and vocational training institutions. This highlights that, despite the significant potential of AI applications like data analytics, learning management systems (LMS), intelligent tutoring systems (ITS), and automated grading tools, their use is still quite limited in many educational institutions. These mixed outcomes suggest that the continuing inability to incorporate AI technologies hampers the advancement of training programs which these developments could greatly enhance. A lot of technical and vocational education and training institutions operate on traditional models of trainee and student evaluation, ignoring the fact that AI can provide feedback and enhancements in real time. This neglect of Artificial Intelligence in technical and vocational training settings creates stagnation and deals great harm to the counselors' ability to improve the quality of education.

5. Conclusion and Recommendations

5.1 Conclusion

This research highlighted the ongoing challenges in managing training programs within technical and vocational training institutions. Trainee performance in both formative and summative assessments has been subpar, and there have been issues with poorly planned industrial attachment sessions, wasted instructional time, and ineffective communication and collaboration. To address these issues, many technical and vocational training institutions have started to incorporate artificial intelligence applications. However, the implementation has not been as effective as it could be. The study indicated that, despite the considerable potential of AI tools such as data analytics, learning management systems (LMS), intelligent tutoring systems (ITS), and automated grading tools, their application remains quite limited in numerous TVETs.

5.2 Recommendations

The study suggests that technical and vocational training institutions should keep investing in artificial intelligence to enhance the management of training programs and utilize AI to tailor training models for individual trainees. This is important because AI can assess learning patterns and propose personalized learning plans that address the specific needs and skill gaps of aspiring trainees. By implementing these systems, institutions can pinpoint areas where trainees require improvement, enabling targeted interventions and promoting professional development.

References

Adams, R., & Green, J. (2022). Challenges in communication and collaboration in training programs. *Journal of Educational Management*, *40*(3), 75-88.

Ademola, A., & Okwudire, M. (2022). AI Applications in Training in Africa: Challenges and Opportunities. *Journal of Educational Technology*, *45*(3), 201-215.

Anusri, K. & Anindya, B. (2022). A Study on Quality Management in Trainee Education: Issues and Challenges. *Quarterly refereed journal of dialogues on education*, *11*(1).

Brown, P. (2021). Ineffective planning and industrial attachment sessions in training. *International Journal of Trainee Education*, *28*(4), 45-61.

Cope, B., & Kalantzis, M. (2016). *Theories of learning and the implications for teaching*. Springer.

Creswell, J. (2018). *Research design: qualitative, quantitative and mixed methods approach.* Thousand Oaks, California: Sage Publications.

Global Education Monitoring Report (2022). *Trainees' experiences and feedback in training programs: A survey conducted in Nairobi County*. Paris, France: UNESCO.

Hamann, E. T., Sánchez, G. J. & Lopez, L. Y. A. (2019). *Trainee Education in México: Higher Expectations, Significant Change, but Still Finite Capacity*. Faculty Publications: Department of Teaching, Learning and Trainee Education.

Harris, T., & Lee, M. (2023). Streamlining administrative processes in training with AI applications. *Educational Management Review*, *9*(1), 32-45.

Johnson, R., & Smith, P. (2021). *AI in Higher Education: Transforming Training Management in the USA*. Journal of Higher Education Technology, *28*(2), 56-72.

Johnson, S., & Adams, R. (2022). Personalized learning in training: The role of AI technologies. *Teaching and Trainee Education Journal*, *29*(3), 102-116.

Li, X., Zhang, W., & Cheng, Y. (2022). Personalized Learning Through AI: Evidence from Chinese Training Programs. *Education and Information Technologies*, *27*(4), 1075-1092.

McCarthy, J. (1960). *Programs with common sense*. In *Proceedings of the symposium on mechanization of thought processes* (pp. 75–91). London: Her Majesty's Stationery Office.

Martinez, L., & Cummings, J. (2023). Adaptive learning technologies in training: A review of recent advancements. *Journal of Educational Research*, *45*(5), 123-139.

Ministry of Education (2023). *Annual report on training statistics*. Nairobi, Kenya: Government Printer.

Nguyen, H. (2023). Wastage of instructional time in training programs. *Education Today*, *33*(1), 99-112.

Nye, B. D. (2015). The impact of intelligent tutoring systems on student learning. *Learning & Instruction*, *35*(3), 1-11.

Pereira, A. (2023). Challenges in collaboration among educators in Brazil: An analytical study. *Journal of Educational Research*, *12*(3), 213-227.

Rejjak, A., Mrinal, M. & Tapash, D. (2018). Pedagogy and the role of trainees in the teaching learning process. *JETIR*, *5*(5).

Rogers, M., Smith, A., & Thompson, K. (2022). The impact of AI on administrative efficiency in higher education. *Journal of Higher Education Management*, *15*(3), 320-335.

Silva, J., Oliveira, M., & Santos, R. (2022). Assessing training programs in Brazil: Current challenges and potential solutions. *Brazilian Educational Review*, *29*(1).

Smith, A., & Jones, M. (2022). Challenges in trainee performance and assessment. *Journal of Trainee Education*, 19(2), 102-115.

Weber, K., Schmidt, R., & Müller, A. (2021). Enhancing Training through AI: Evidence from Germany. *European Journal of Trainee Education*, *44*(2), 143-161.