



Rethinking Curriculum Implementation in the Digital Era: The Role of Personalized Learning through Learning Management Systems

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Abstract: The digital transformation of higher education requires a reconceptualization of curriculum implementation towards flexible, learner-centred, and adaptive approaches. Learning Management Systems provide opportunities for enhancing curriculum delivery through personalized learning, feedback, assessment, and learner engagement. However, universities continue to use LMS mainly for accessing learning materials rather than as tools for transforming curriculum implementation. This study examined the role of personalized learning through LMS in enhancing curriculum implementation at Kyambogo University. A convergent mixed methods research design was adopted, involving 185 administrators, lecturers, and students from selected faculties. Data were collected using questionnaires and interviews and analyzed through descriptive statistics, Pearson correlation, regression analysis, and thematic analysis. Findings revealed that LMS-supported personalized learning enhances flexibility, self-paced learning, access to diverse resources, individualized feedback, and learner autonomy. A significant positive relationship was found between personalized learning and curriculum implementation ($r = .391, p < .001$), while regression analysis confirmed personalized learning as a significant predictor of curriculum implementation. However, challenges including inadequate digital infrastructure, high internet costs, limited digital competencies, and accessibility barriers constrained effective LMS utilization. The study concludes that personalized learning through LMS provides curriculum implementation in higher education, but requires institutional policies, digital capacity development.

Keywords: Personalised learning, Curriculum implementation, Learning Management System, Digital era

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1. Introduction

The rapid advancement of digital technologies has transformed the landscape of education, particularly in higher education where institutions are increasingly adopting technology-supported approaches to enhance teaching, learning, and curriculum delivery. The emergence of digital learning environments has challenged traditional models of curriculum implementation that were largely based on uniform instructional approaches, fixed learning schedules, and

standardized assessment practices. In the contemporary digital era, effective curriculum implementation requires approaches that recognize learner diversity, promote flexibility, and support meaningful engagement between learners, instructors, and learning resources.

Learning Management Systems (LMS) have emerged as important technological platforms for supporting digital transformation in education. According to Mershad and Wakim (2020), Learning Management Systems refer to evolving technologies that provide opportunities for course creation, delivery, management, tracking,

reporting, and assessment of online learning materials. Similarly, Mohammadi (2020) defines a Learning Management System as a software application designed to plan, implement, and evaluate a specific learning process. These definitions highlight the multifunctional nature of LMS platforms in facilitating not only access to learning resources but also communication, assessment, monitoring of learner progress, and management of instructional activities.

In higher education institutions, LMS platforms have increasingly become central tools for extending learning beyond physical classrooms and supporting blended, online, and flexible learning approaches. Through LMS functionalities such as digital content management, discussion forums, online assessments, learning analytics, and feedback mechanisms, instructors are able to redesign learning experiences and create opportunities for continuous interaction between learners and curriculum content. Consequently, LMS has the potential to influence how curricula are interpreted, delivered, experienced, and evaluated within changing educational contexts.

One of the emerging approaches facilitated by LMS environments is personalized learning. Personalized learning represents a shift from teacher-centred and standardized models of instruction towards learner-centred approaches that acknowledge individual differences among learners. Hughey (2020) defines personalized learning as an instructional approach where learning experiences are paced according to learners' needs, tailored to their preferences, and aligned with their specific interests. This approach emphasizes learner autonomy, flexibility, differentiated instruction, and the use of evidence about learners' progress to support appropriate learning pathways.

The integration of personalized learning within LMS environments provides opportunities for curriculum implementation to become more adaptive and responsive. Through data generated from learner interactions, LMS platforms can support instructors in identifying learners' strengths, weaknesses, learning patterns, and areas requiring additional support. Personalized learning features such as adaptive resources, individualized feedback, self-paced learning activities, and differentiated assessments can therefore contribute to improved learner engagement and achievement of curriculum objectives.

However, despite the increasing adoption of LMS in higher education institutions, many institutions continue to use these platforms primarily as repositories for uploading lecture notes, announcements, and assessment materials rather than as tools for transforming curriculum implementation. This limited utilization raises questions about whether LMS platforms are fully contributing to learner-centred and personalized approaches to

curriculum delivery. Furthermore, while existing studies have examined LMS adoption, usability, and acceptance among users, less attention has been given to how personalized learning enabled by LMS contributes to the broader process of curriculum implementation.

The digital transformation of education therefore requires a reconceptualization of curriculum implementation beyond traditional classroom practices towards models that integrate technology, learner diversity, and personalized learning experiences. This study therefore examines how personalized learning facilitated through Learning Management Systems contributes to curriculum implementation in universities, in this digital era.

1.1 Statement of the Problem

The rapid advancement of digital technologies has significantly transformed the landscape of higher education, challenging traditional approaches to curriculum implementation. Contemporary learning environments increasingly require flexible, learner-centred, and technology-supported approaches that respond to diverse learner needs, abilities, interests, and learning preferences. However, despite growing investments in Learning Management Systems (LMS) in higher education institutions, curriculum implementation largely continues to rely on traditional approaches that may not adequately address individual learner differences and the demand for personalized learning experiences, (Watters, 2023). In addition, the integration of personalized learning practices within LMS environments remains inconsistent, (Sellaheva, 2025), with many institutions primarily using LMS platforms as repositories for learning materials and administrative communication rather than as transformative tools for curriculum implementation.

Furthermore, existing studies on educational technology have extensively examined LMS adoption, user acceptance, and online learning effectiveness; however, limited attention has been given to how personalized learning facilitated through LMS contributes to the broader process of curriculum implementation, particularly in higher education contexts. This creates a conceptual and empirical gap regarding how digital technologies are reshaping curriculum delivery, assessment, learner engagement, and achievement of curriculum objectives.

Therefore, this study sought to investigate curriculum implementation in the digital era by examining the role of personalized learning through Learning Management Systems.

1.2 Research Objective

To assess whether personalized learning through learning management system influences curriculum implementation.

1.3 Research Question

Does personalized learning through the Learning Management System influence curriculum implementation?

2. Literature Review

This study is under pinned by Transactional Distance Theory as the primary theoretical framework of the study, with Connectivism Theory serving as a complementary framework for understanding learning in digitally mediated and networked environments. The review highlights how transactional distance theory explains the processes through which knowledge is created, shared, and sustained across networks of individuals, digital tools, and information systems.

This theoretical grounding provides a foundation for analysing curriculum implementation, learner engagement, and the integration of emerging technologies in modern educational settings. Transactional Distance Theory, originally advanced by Michael G. Moore, conceptualizes distance in education not merely as a function of geographical separation but as a pedagogical and psychological space that exists between learners and instructors. This “transactional distance” emerges from the interplay among three core variables: dialogue, structure, and learner autonomy. Learner autonomy is a fundamental dimension of personalized learning, as it empowers learners to take responsibility for their own learning by allowing them to set learning goals, make choices about learning pathways, regulate the pace of learning, monitor their progress, and reflect on their learning outcomes. Within Learning Management Systems, personalized learning promotes learner autonomy by providing flexible access to learning resources, adaptive learning activities, individualized feedback, and self-paced learning opportunities that enable learners to make informed decisions about their educational experiences.

Transactional Distance Theory remains a central analytical framework for understanding teaching and learning in digitally mediated environments. One of the most comprehensive contemporary contributions is provided by Achuthan, Kolil, Muthupalani, and Raman (2024), whose systematic review synthesizes decades of research while foregrounding post-2020 developments in distance education. Their work situates transactional distance theory as particularly

relevant in the aftermath of the COVID-19 pandemic, a period characterized by the rapid expansion of emergency remote teaching and long-term institutional adoption of online and blended learning. The authors argue that Moore’s core constructs dialogue, structure, and learner autonomy retain strong explanatory power in contemporary contexts, especially when analysing learner engagement, satisfaction, and persistence. Importantly, they highlight that modern learning management systems and communication technologies can simultaneously reduce and exacerbate transactional distance, depending on how instructional dialogue is intentionally designed. This synthesis reinforces Transactional Distance Theory as a resilient and adaptable theory capable of guiding both research and practice in higher education.

Empirical validation of Transactional distance theory during the pandemic period is further strengthened by Batita and Chen (2022), who examined university students’ online learning experiences during COVID-19 disruptions. Their study provides strong quantitative evidence supporting Moore’s original propositions, demonstrating that increased instructor learner dialogue and flexible course structure significantly reduce perceived transactional distance. The authors emphasize that transactional distance is not an inevitable consequence of online learning but rather a pedagogical outcome shaped by instructional decisions. Their findings underscore the relevance of Transactional Distance Theory for crisis-responsive and planned online education alike, positioning the theory as a diagnostic tool for evaluating instructional quality under conditions of rapid digital transition.

In hybrid and blended learning environments, Ottenheim, Meulenbroeks, and Drijvers (2025) extend Transactional Distance Theory by systematically reviewing how transactional distance manifests when learners alternate between physical and virtual classrooms. Their analysis reveals that hybrid education introduces new layers of psychological distance, particularly due to inconsistencies in communication patterns and learner participation across modalities. While affirming the relevance of Moore’s constructs like learner autonomy, transactional distance in hybrid settings is more fluid and dynamic, requiring instructors to intentionally align dialogue and structure across both online and face-to-face components. This work supports TDT while simultaneously calling for its contextual refinement, demonstrating the theory’s capacity for evolution rather than obsolescence.

An (2025) investigated the role of Learning Management Systems in promoting learner autonomy and reading comprehension among English students at a university in Ho Chi Minh City, Vietnam. While LMS platforms have been widely adopted in higher education, there is a gap in research examining their effectiveness in fostering

independent learning and learner autonomy, particularly in language education contexts. Using a mixed-methods design, the study analyzed quantitative outcomes from 160 students alongside qualitative feedback from questionnaires to capture both student and instructor perspectives. Findings indicated that LMS platforms provide accessible and structured learning experiences; however, their effectiveness in promoting learner autonomy depends on pedagogical integration tailored to students' digital literacy levels. The study provides context-specific insights into how LMS-supported reading tasks can facilitate autonomous learning, highlighting the interaction between technology and learner-centered pedagogy to enhance educational outcomes. The research also offers practical recommendations for optimizing LMS implementation in language teaching and suggests avenues for future investigation, including cross-institutional studies and exploration of emerging LMS technologies.

Hasanah (2026) analyzed students' understanding of their role as administrators in using Learning Management Systems as digital learning platforms in an educational administration program at Universitas Muhammadiyah Bogor Raya. While prior research has explored LMS adoption and usage broadly, there is a gap in studies that examine students' active administrative roles in managing LMS platforms and how this experience influences their learning independence and understanding of digital learning management. Using a descriptive qualitative approach, data were collected through interviews and analyzed via data reduction, presentation, and triangulation. Findings revealed that students generally understood LMS as a platform for accessing learning materials, submitting assignments, and obtaining academic information, though comprehension varied, particularly at initial stages of usage. Challenges included difficulties navigating certain features, system limitations, and unstable internet connections, yet students adapted through self-directed learning, peer discussions, and seeking guidance from lecturers. Engaging students as administrators of the Learning Management System enhances learning independence and digital literacy, emphasizing the pedagogical value of hands-on involvement in managing educational technology. The findings underscore the need for continuous technical support and guidance to optimize the effectiveness of Learning Management Systems in higher education.

Kusnendar, Darmawan, Rusman, and Rachman (2025) examined the implementation of differentiated learning using Moodle in personalized informatics courses at vocational high schools. Although differentiated instruction is recognized as a means to address diverse student learning needs, there is a gap in research on how learning management systems can support personalized learning and accommodate varied learning styles in secondary education contexts. Using a descriptive qualitative design, the study collected data through direct

interviews with student representatives to capture responses to differentiated learning approaches. Teaching materials were tailored through Moodle features to reflect content differentiation, and formative and remedial summative tests were used to achieve process differentiation. Results showed that students exhibited diverse learning patterns and preferences, that process differentiation effectively supported varied abilities to achieve learning completeness, and that students responded positively to the availability of tailored materials, alignment with learning readiness, and opportunities to progress at their own pace. The research highlights how integrating differentiated learning strategies within a learning management system can cater to diverse learning preferences, enhance engagement, and promote equitable educational outcomes in personalized learning environments.

Du, Liu, and Zhao (2025) examined the integration of self-regulated learning support within a learning management system to enhance student autonomy and academic performance in online and blended learning environments. While self-regulated learning is widely recognized as essential for academic success, there is a gap in research on how structured instructional guidance embedded within digital platforms can support students in applying self-regulated learning strategies effectively. Using a quasi-experimental design, 69 college students were assigned to either an experimental group with access to both course content and self-regulated learning training sections, or a control group with access to only the course content. Findings showed that students with structured support reported higher levels of self-regulation, applied self-regulated learning strategies more frequently and diversely, and achieved better performance on the first examination. However, no significant difference was observed on the second examination. The research demonstrates how embedding targeted self-regulated learning interventions within digital learning platforms can enhance student autonomy and strategic learning behaviors, offering practical guidance for instructional design aimed at sustaining student motivation and improving academic outcomes in online and blended learning contexts.

Han (2025) investigated student engagement and learner autonomy in the use of a dual-mode educational chatbot within a large-scale online course. While chatbots are increasingly integrated into online learning, there is a gap in empirical research examining how students interact with multi-mode chatbots and exercise autonomy when selecting between general and reference-based modes. The study employed a mixed-methods explanatory sequential design, analyzing chatbot interaction logs, learning management system logs, server data, and survey responses. Findings revealed that a substantial proportion of students were unaware of or indifferent to mode selection, whereas those who engaged deliberately chose modes based on convenience or alignment with course content. Users of the reference-based mode

demonstrated higher engagement with hyperlinks, which correlated positively with social presence, teaching and cognitive presence, self-regulation, and perceived ease of use. Interaction patterns differed between modes, with exploratory and socio-emotional talk dominating the general mode, and course-focused inquiries dominating the reference-based mode. The research illustrates how dual-mode chatbots can support learner autonomy and differentiated interaction patterns, emphasizing the importance of intentional design that aligns technological features with pedagogical objectives to enhance engagement and self-regulated learning.

Spriggs, Lau, and Passi (2025) explored the integration of large language models within learning management systems to develop an adaptive system personalized for individual learners across various educational contexts. While traditional learning management systems support content distribution, there is a gap in research addressing how adaptive systems leveraging artificial intelligence can meet the nuanced needs of diverse learners, particularly in settings with limited instructor availability. The proposed system combines general-purpose and domain-specific language models to deliver a customizable learning environment that adapts to users' evolving needs while minimizing issues such as outdated information and factual inaccuracies. The system also addresses privacy concerns and enhances engagement by providing personalized educational content. The research demonstrates how integrating adaptive artificial intelligence into learning management systems can create a responsive, learner-centered environment, offering practical insights into enhancing personalization, engagement, and educational equity in technology-mediated learning contexts.

Almusfar (2025) conducted a comprehensive study on improving Learning Management System (LMS) performance by examining key factors such as engagement, trust, and adaptive learning, with a focus on user satisfaction and loyalty. The study employed a quantitative approach and structural equation modelling to analyse responses from 266 university students. The study found that system quality particularly in terms of reliability and usability has a significant influence on user satisfaction. Adaptive learning was shown to enhance engagement and satisfaction by delivering personalized content, while trust, especially related to data security and system dependability, emerged as a critical contributor to positive user experiences. Although information quality also positively affected satisfaction, its impact was less substantial than that of system-related variables. Additionally, service quality, though a smaller factor, underscored the value of responsive technical support. The findings revealed a strong relationship between user satisfaction and loyalty, indicating that satisfied users are more likely to consistently use and recommend LMS platforms. While the study offers valuable insights into technical and adaptive elements that enhance LMS effectiveness, it

leaves a gap in understanding how these performance factors particularly adaptive learning and trust interact with pedagogical elements like feedback strategies to influence long-term learning outcomes and learner autonomy across diverse educational contexts.

Kothandapani et al. (2025) presented the development of an enhanced self-learning management system built using modern web technologies in response to the increased demand for effective online learning platforms following the COVID-19 pandemic. The system features seamless navigation, robust data handling, and interactive functionalities that collectively enhance the user experience. A key innovation is the integration of artificial intelligence for multi-person detection during quizzes, which strengthens assessment security and academic integrity. Additionally, the LMS includes advanced data visualization tools that support the generation of personalized feedback, thereby promoting adaptive learning. The platform's accessibility ensures that students can interact with course materials from any location, making it a flexible and inclusive solution for digital education. The authors underscore the critical role of thoughtful system design in shaping user interaction and educational outcomes. However, while the study addresses technical advancements and usability, a notable gap remains in exploring how learners engage with such AI-powered and feedback-driven systems over time, particularly in terms of their effects on self-directed learning, motivation, and sustained academic performance in varied educational and cultural contexts.

Pratisto and Danoetirta (2025) explored the design and user experience of a Learning Management System (LMS) tailored to support student competency-based learning, where learners progress at their own pace and demonstrate mastery of defined skills. The study aimed to develop an LMS capable of facilitating both formative and summative assessments, managing diverse user roles, distributing assignments flexibly, and promoting self-directed learning. The study employed an agile development approach, where the researchers collaborated closely with stakeholders, used UML to structure system workflows, and refined features through continuous testing in iterative sprints. Usability testing with 80 student participants resulted in a high System Usability Scale score of 81.75, indicating strong user satisfaction and functional effectiveness. The system enabled real-time progress tracking and timely feedback for students, while simplifying assessment management for teachers. Although the study demonstrates promising outcomes, it was limited to a single school and short-term implementation.

Pramesworo (2023) carried out a fascinating study that delves into the connection between Blended Learning and Students' Independent Learning Curriculum. The goal was to investigate how blended learning relates to students' ability to learn independently in our digital world. To gather and analyze data, the study employed a

descriptive method with a qualitative approach, tapping into a diverse group of participants. Various data collection techniques were used to ensure a thorough and detailed exploration of the topic. The sample included teachers from different educational levels, students with a range of academic backgrounds, and educational administrators experienced in curriculum development and implementation. The findings revealed a strong link between blended learning and the enhancement of independent learning skills among students. The study emphasized the crucial role of teacher support, collaborative opportunities, and access to technology and resources in boosting the effectiveness of both blended and independent learning practices. These insights contribute to the ongoing conversation about education in the digital age and offer valuable guidance for educators and policymakers looking to create effective instructional strategies that empower students' independent learning skills in today's digital landscape. It's worth noting that this study focused solely on qualitative analysis, leaving room for future research to incorporate quantitative methods.

Naseer (2024) conducted an insightful study on how deep learning can be used to create personalized learning paths in colleges. The study pointed out how important it is to have education that fits individual needs by using deep learning techniques. They introduced an AI-based learning platform that was tested in four different courses with 300 students at a university in Faisalabad, Pakistan. They ran a controlled experiment to see how students using this AI platform did compared to those in regular classes. The results showed that the AI group had a 25% boost in grades, test scores, and engagement, with a p -value of 0.00045. Plus, feedback from students indicated they enjoyed their personalized learning experiences more than the traditional approach. Overall, this research suggests that AI tools can really help improve student performance and satisfaction compared to standard teaching methods. Naseer also supported teaching methods that focus on students' needs. This study, based in Pakistan, points out a gap that my research hopes to fill.

A study conducted by Davuluri in 2021 focused on Personalized Learning Pathways through the use of Machine Learning Algorithms. This research delved into how machine learning can be applied to develop adaptive learning systems that evaluate each student's individual strengths, weaknesses, and learning styles. By sifting through large volumes of educational data, these algorithms were able to predict student performance, suggest tailored learning materials, and modify teaching strategies in real time. The study underscored both the advantages and challenges of using AI in education. Through various case studies, it showcased successful applications of machine learning across different educational settings, highlighting improvements in student engagement, retention, and academic success. Ultimately, the findings indicated that machine learning

could greatly enhance educational practices, leading to a more personalized and inclusive learning environment. However, it leaned heavily on quantitative analysis, leaving room for qualitative insights that this study aims to address

Koh (2021) explored how students engage with learning management systems and what they hope to gain from their e-learning experiences. The study aimed to understand the relationship between students' usage of these systems and their expectations for next-generation digital learning environments. To gather insights, a survey was conducted with 262 Fine Arts majors. The findings revealed that students who frequently utilize learning management systems for content learning and discussions also express a strong desire for more student-centered e-learning activities. They want systems that facilitate content curation, manage private groups, and offer mobile compatibility. This indicates that students' current experiences significantly influence their preferences for e-learning systems. To enhance student-centered digital learning experiences, it's essential to consider both infrastructure improvements and faculty training together. However, it's worth noting that this research focused solely on Fine Arts students, leaving a gap in understanding other populations that this study aims to address.

3. Methodology

The study adopted a parallel convergent mixed methods research design to obtain both quantitative and qualitative data on how feedback mechanisms within Learning Management Systems contribute to curriculum implementation in higher learning institutions. The design enabled the researcher to collect, analyse, and compare quantitative and qualitative findings simultaneously in order to achieve a comprehensive understanding of the study problem.

The study was carried out at Kyambogo University, specifically within the Faculties of Engineering and Special Needs Education. The university was selected because it actively utilizes Learning Management Systems to facilitate teaching, learning, assessment, and communication between lecturers and students.

The target population comprised administrators, lecturers, and students at Kyambogo University who were directly involved in the use of the Learning Management System for teaching and learning activities. These respondents were considered appropriate because they possessed relevant knowledge and experience regarding LMS feedback mechanisms and curriculum implementation.

A sample size of 185 respondents was selected for the study. Purposive sampling techniques were used to select participants who actively interacted with the Learning Management System and could provide relevant

information regarding feedback mechanisms and curriculum implementation. The sampling approach enabled the researcher to obtain rich and reliable data from respondents with adequate experience in LMS usage.

Data were collected using structured questionnaires and interview guides. Questionnaires were administered to respondents to obtain quantitative data regarding perceptions of LMS feedback mechanisms and curriculum implementation. Interview guides were used to collect qualitative data from selected participants in order to gain deeper insights into their experiences, challenges, and views regarding the use of LMS feedback systems in teaching and learning.

Quantitative data were analysed using descriptive and inferential statistical techniques with the aid of Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data, while Pearson correlation and regression analysis were employed to determine the relationship between feedback mechanisms and curriculum implementation. Qualitative data obtained from interviews were analysed thematically to identify recurring themes, patterns, and meanings related to LMS feedback mechanisms and curriculum implementation

The researcher also endeavoured to get consent from all the respondents individually. The researcher assured the various participants of confidentiality. Given the nature of the research, anonymity was observed as some people didn't want their names and age to be revealed. Confidentiality was maintained primarily through anonymization, meaning no personally identifying information (such as names, registration numbers, or email addresses) were collected or linked to individual responses during data collection. This ensured that participants' identities were not traced back to their input, even by the researcher. The researcher planned time lines and adhered to them in order to avoid delays, which could compromise the integrity of the research process and trust of participants. Access to the raw data was strictly limited to the principal investigator.

4. Results and Discussion

This section presents the quantitative data analysis of the study, focusing on the statistical examination of the relationship between personalised learning and curriculum implementation in order to provide objective evidence on the extent to which the independent variables influence curriculum implementation.

4.1 Personalised Learning Pathways

Table 1: Personalised learning pathways employed at Kyambogo University

Statements	SD		D		NS		A		SA		Mean	SD
	F	%	F	%	F	%	F	%	F	%		
The LMS allows me to choose learning materials that match my learning preferences	6	3.2	14	7.6	11	5.9	71	38.4	83	44.9	4.14	1.043
I can set my own learning goals and track progress through the LMS	4	2.2	17	9.2	27	14.6	59	31.9	78	42.2	4.03	1.065
The LMS provides timely feedback that helps me improve my learning	5	2.2	10	5.4	13	7.0	69	37.3	88	47.6	4.22	0.982
I can access learning resources on the LMS at my convenience	6	3.2	6	3.2	10	5.4	51	27.6	112	60.5	4.39	0.967
The LMS offers learning activities that cater to different skill levels	3	1.6	7	3.6	14	7.6	67	36.2	94	50.8	4.31	0.889
I receive personalized recommendations for additional learning materials on the LMS.	6	3.2	18	9.7	25	13.5	54	29.2	82	44.3	4.02	1.125
The LMS allows me to learn at my own pace	4	2.2	5	2.7	11	5.9	66	35.7	99	53.5	4.36	0.880
The LMS enables interaction with instructors for personalized support	10	5.4	14	7.6	30	16.2	66	35.7	65	35.1	3.88	1.138
Assessment tools on the LMS reflect my learning progress and areas for improvement.	5	2.7	11	5.9	16	8.6	75	40.5	78	42.2	4.14	0.988
The LMS integrates various multimedia resources (videos, quizzes, readings) to suit different learning styles	5	2.7	6	3.2	15	8.1	61	33.0	98	53.0	4.30	0.947

The findings reveal that most respondents agreed that the Learning Management System (LMS) allows them to choose learning materials that match their learning preferences. A large proportion (83.3%) indicated agreement or strong agreement, showing that learners feel empowered to make choices that align with their personal learning styles. The mean score of 4.14 with a standard deviation of 1.043 confirms a generally strong positive perception, though with slight variation among users. This suggests that while most learners value the flexibility provided by the LMS, a few may not be fully utilizing or aware of how to customize learning materials to fit their preferences.

Similarly, respondents reported that they can set their own learning goals and track their progress through the LMS. About 74.1% agreed with this statement, yielding a mean of 4.03 and a standard deviation of 1.065. This implies that the LMS supports self-regulated learning, where learners are able to monitor their advancement and reflect on their academic journey. The moderate spread of responses (as shown by the SD) indicates that not all learners may find goal-setting or progress-tracking tools equally intuitive or accessible, pointing to the need for more guidance on using such features effectively.

The results also show that the LMS provides timely feedback that helps students improve their learning, as

evidenced by a mean score of 4.22 and an SD of 0.982. This strong agreement demonstrates that feedback mechanisms within the system are effective in supporting continuous learning. Since timely feedback enhances learners' ability to correct mistakes and reinforce strengths, this finding highlights the LMS as a reliable platform for academic improvement and formative assessment.

Ease of access emerged as one of the LMS's strongest attributes. A majority (88.1%) of respondents agreed that they can access learning resources at their convenience, with a mean of 4.39 and SD of 0.967. This high level of satisfaction illustrates the flexibility and accessibility of the platform allowing learners to study anywhere and at any time. Such flexibility is a key feature of modern digital learning environments, promoting independent and self-paced learning.

Respondents further indicated that the LMS offers learning activities suited to different skill levels, showing inclusivity in content design. The mean score of 4.31 and SD of 0.889 demonstrate a strong and consistent agreement among users. This finding implies that the system accommodates learners of varying abilities, thereby promoting equity in educational opportunities and encouraging continuous participation across skill levels.

In terms of personalized recommendations, 73.5% of respondents agreed that the LMS provides suggestions for additional learning materials. With a mean of 4.02 and SD of 1.125, the results suggest that while the majority benefit from this feature, experiences are somewhat varied. The higher SD points to differences in how personalization algorithms or instructor-curated recommendations are applied. Enhancing this function could further individualize learning pathways for students.

The data also show that learners appreciate the opportunity to learn at their own pace, a statement that recorded a mean of 4.36 and SD of 0.880. This indicates widespread consensus that the LMS supports flexible pacing, allowing learners to review materials and complete tasks according to their individual schedules. Such autonomy fosters deeper understanding and accommodates diverse learning speeds.

Interaction with instructors for personalized support, however, received comparatively lower ratings. The mean score of 3.88 with a higher SD of 1.138 reveals that while many learners find instructor support helpful, others may experience delays or limited responsiveness. This variability could stem from differences in instructor engagement, workload, or communication strategies. Strengthening teacher presence and promoting active support within the LMS could enhance personalized learning even further.

Respondents also acknowledged that assessment tools on the LMS accurately reflect their progress and areas of improvement, recording a mean of 4.14 and SD of 0.988. This shows that learners perceive online assessments as effective in providing insights into their performance. It suggests that the system's analytical tools and feedback reports help guide students toward self-improvement and better academic outcomes.

Finally, the integration of multimedia learning resources such as videos, quizzes, and readings received high approval, with a mean of 4.30 and SD of 0.947. This result confirms that learners appreciate the variety of instructional materials available, which cater to diverse learning styles. The presence of multiple resource formats enhances engagement, interactivity, and comprehension, thereby making learning more dynamic and inclusive.

In conclusion therefore, the data indicate that respondents hold a strongly positive perception of the LMS as a tool that enhances personalized learning. The consistently high mean scores (ranging from 3.88 to 4.39) show that learners value the platform's ability to provide flexibility, accessibility, and individualized learning experiences. However, the relatively higher variability in areas such as instructor support and personalized recommendations suggests the need for improvement in these features. Strengthening instructor engagement, optimizing adaptive technologies, and offering training on personalized learning tools could maximize the LMS's potential to support self-directed, learner-centred education.

4.2 Correlation between Personalised Learning and Curriculum Implementation

Table 2: Correlation between personalised learning and curriculum implementation

		Curriculum implementation	Personalise learning
Curriculum implementation	Pearson Correlation	1	.391**
	Sig. (2-tailed)		.000
	N	185	185
Personalised learning	Pearson Correlation	.391**	1
	Sig. (2-tailed)	.000	
	N	185	185

** Correlation is significant at the 0.01 level (2-tailed).

The table above presents the correlation analysis between curriculum implementation and personalised learning. A Pearson product-moment correlation analysis was conducted to examine the relationship between personalised learning and curriculum implementation. The analysis included 185 respondents. The results revealed a moderate, positive, and statistically significant relationship between personalised learning and curriculum implementation ($r = .391$, $p < .001$).

The positive direction of the correlation indicates that higher levels of personalised learning are associated with higher levels of curriculum implementation effectiveness. In practical terms, this suggests that educational contexts that emphasise learner-centred strategies, adaptive instructional approaches, and responsiveness to individual learner needs tend to demonstrate stronger implementation of the prescribed curriculum.

The strength of the relationship ($r = .391$) falls within the moderate range according to Cohen's (1988) effect size guidelines, where coefficients of .10, .30, and .50 represent small, medium, and large effects, respectively. Although the relationship is not strong, it is substantial

enough to suggest meaningful practical implications within educational settings.

The statistical significance of the relationship ($p < .001$) indicates that the observed association is unlikely to have occurred by chance. Therefore, the null hypothesis stating that there is no statistically significant relationship between personalised learning and curriculum implementation is rejected. The alternative hypothesis is supported.

Overall, the findings provide empirical evidence that personalised learning is an important predictor of curriculum implementation. The results reinforce theoretical arguments that learner-centred pedagogical approaches enhance instructional coherence, promote engagement, and facilitate more effective translation of curriculum intentions into classroom practice. However, the moderate magnitude of the relationship also suggests that personalised learning should be understood as one component within a broader constellation of factors influencing curriculum implementation.

4.3 Regression Analysis between Personalised Learning and Curriculum Implementation

Table 3: Regression analysis on personalised learning and curriculum implementation

R Square =.153		F= 19.842				
Adjusted R =. 145		Sig = . 000b				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.615	.331		7.902	.000
	PERSONALISED	.348	.079	.371	4.455	.000
a. Dependent Variable: CURRICULLUM IMPLEMENTYATION						

The regression analysis indicates that personalised learning remains a significant predictor of curriculum implementation. The model explains 15.3% of the variance in curriculum implementation ($R^2 = .153$; Adjusted $R^2 = .145$), demonstrating a modest but meaningful explanatory contribution. The overall

regression model was statistically significant ($F = 19.842$, $p < .001$), confirming that personalised learning reliably predicts curriculum implementation outcomes.

The unstandardized coefficient ($B = .348$, $SE = .079$) suggests that a one-unit increase in personalised learning

results in a .348-unit increase in curriculum implementation. The standardized beta ($\beta = .371$) reflects a moderate positive influence. The t-value ($t = 4.455, p < .001$) further confirms the statistical strength of the predictor. The constant (2.615) represents the expected level of curriculum implementation when personalised learning is held constant at zero.

These findings suggest that structured personalised learning approaches such as adaptive instructional design, learner-specific content sequencing, and responsive feedback systems contribute positively to curriculum delivery. However, the moderate R^2 value indicates that personalised learning operates alongside other institutional and pedagogical factors. Overall, the results reinforce the role of learner-centred digital strategies in strengthening curriculum implementation within higher education contexts.

The regression analysis shows that personalized learning significantly predicts curriculum implementation in higher learning institutions. The model explains 14.6% of the variance in curriculum implementation ($R^2 = 0.146$; Adjusted $R^2 = 0.138$), indicating that personalized learning accounts for a meaningful, though partial, proportion of the variability in curriculum outcomes. The overall model is statistically significant ($F = 18.177, p < 0.001$), demonstrating that personalized learning reliably predicts curriculum implementation.

The unstandardized coefficient for personalized learning ($B = 0.366, SE = 0.086$) suggests that a one-unit increase in personalized learning corresponds to an expected increase of 0.366 units in curriculum implementation. The standardized coefficient ($\beta = 0.383$) indicates a moderate positive effect, highlighting personalized learning as a significant driver relative to other variables measured in different scales. The t-value ($t = 4.263, p < 0.001$) confirms that the effect is statistically robust. The intercept of 2.707 represents the expected curriculum implementation level when personalized learning is absent. The overall regression model was statistically significant ($F = 18.177, p < 0.05$). Consequently, the null hypothesis was rejected.

These findings suggest that LMS-enabled personalized learning pathways support individualized instruction, adaptive assessments, and learner-centered engagement, which enhance curriculum delivery. The results are theoretically consistent with Connectivism theory, emphasizing that knowledge acquisition is facilitated through adaptive learning networks, and with Transactional Distance theory, as personalized learning reduces learner-instructor distance by allowing tailored interaction and feedback. In conclusion, personalized learning is a significant contributor to curriculum implementation, reinforcing the importance of learner-centred strategies and adaptive instructional design in higher education.

4.4 Discussion

Several studies have demonstrated the potential benefits of personalized learning in supporting curriculum implementation. For instance, Naseer (2024) found that an AI-powered platform significantly improved student performance and engagement by tailoring instruction to learners' needs, while Davuluri (2021) showed that machine learning algorithms can successfully adapt curriculum delivery based on individual learning styles. Similarly, Almusfar (2025) emphasized that adaptive learning systems enhance satisfaction and loyalty by providing customized content, while Pratisto and Danoetirta (2025) demonstrated that LMS designs enabling competency-based learning support self-directed progress and curriculum mastery. These studies collectively underscore the role of PLPs in aligning instruction with curriculum goals and enhancing learner autonomy.

Moreover, Piech (2023) argued that effective curriculum alignment requires learner participation in content creation (learner sourcing), which goes beyond algorithm-driven personalization. If Personalised Learning Plans are overly technology-centred without sufficient student agency, they may not foster the desired outcomes. These perspectives align with the present study's weak correlation, highlighting that personalization in itself may not automatically improve curriculum implementation.

Another implication is that the effectiveness of Personalized Learning Plans may hinge on learner motivation and self-regulation. Lee & Tang (2024) argue that active engagement strategies, such as flipped classroom models, can only succeed when learners are motivated and capable of managing their own study schedules. If Personalized Learning Plans do not adequately support these behavioural and motivational dimensions, they may not translate into measurable curriculum outcomes.

Additionally, institutional scaffolding plays a decisive role. While Guri-Rosenblit (2021) advocate for multi-layered guidance systems, Tangang & Fokong (2025) found that students frequently underutilize available academic support due to digital fatigue or lack of awareness. In such contexts, even advanced personalized pathways may fail to achieve their intended objectives because students do not engage with the full range of available supports.

On the other side, Rodriguez-Triana et al. (2023) caution that while learning analytics can track compliance with curriculum guidelines, they also raise significant concerns around privacy, consent, and algorithmic bias. If students perceive these systems as intrusive or inequitable, their engagement with Personalised Learning Plans may be diminished.

The integrated findings reveal strong overall convergence between quantitative and qualitative data on the contribution of LMS-supported personalised learning to curriculum implementation at Kyambogo University. Quantitative results indicate high agreement on flexible access to learning resources. These findings are reinforced by qualitative accounts showing that learners can access materials at any time and regulate their own study pace. This aligns with Siemens (2022) who found out that LMS platforms effectively promote learner autonomy, which is increasingly recognised in digital education research as a core driver of personalised learning effectiveness).

Strong convergence is also evident in differentiated learning and skill-based progression. Quantitative findings show high agreement that LMS supports learning by ability level, while qualitative data confirm that students experience varied learning pathways depending on their academic needs. This indicates that personalised learning is not only system-enabled but also experienced in practice. Kimmons (2025), emphasise that adaptive digital environments enhance differentiated instruction by allowing learners to engage with content at varying levels of complexity

In addition, both datasets converge on the importance of timely feedback and multimodal learning resources. Quantitative results indicate high agreement on timely feedback, while qualitative findings show that feedback helps learners reflect and correct mistakes. Similarly, multimedia resources such as videos and quizzes were rated highly and described as improving engagement and comprehension. In the research conducted by Ally (2024), multimodal digital learning environments strengthen cognitive engagement and retention when combined with immediate feedback mechanisms.

However, partial convergence is observed in relation to learning analytics, goal setting, and personalised recommendations. Although quantitative results show moderate agreement on goal tracking and recommendations, qualitative findings indicate that these features are inconsistently used or not fully understood by students. This suggests that while LMS systems contain advanced adaptive tools, their utilisation remains limited in practice. Bozkurt (2024) shows that the effectiveness of learning analytics depends heavily on user digital literacy and institutional capacity to interpret and act on data insights.

Similarly, instructor personalised support demonstrates only moderate alignment, with qualitative data revealing inconsistent lecturer involvement in guiding individual learners. This indicates that personalised learning is weakened when human facilitation is insufficient. The same thing was reported by Huang (2025) who noted that effective digital personalisation requires a strong balance

between automated systems and active instructor engagement to sustain meaningful learning experiences

A notable divergence emerges regarding inclusivity and accessibility in LMS-supported personalised learning. While LMS design is intended to promote equitable access to learning opportunities, qualitative findings reveal persistent barriers such as limited ICT skills, disability-related challenges, and financial constraints affecting access to devices and reliable internet connectivity. This suggests a gap between the intended inclusive design of LMS platforms and their actual usability in resource-constrained contexts. Similar concerns are highlighted by (Czerniewicz 2024), who argued that digital learning environments often reproduce existing inequalities when infrastructural and skill-related disparities are not adequately addressed thereby limiting the effectiveness of personalised learning initiatives.

In summary, the findings demonstrate that LMS-supported personalised learning significantly enhances curriculum implementation through improved flexibility, autonomy, and differentiated instruction. However, its effectiveness remains uneven due to limited use of adaptive features, inconsistent instructor support, and persistent accessibility barriers. This suggests that the success of personalised learning depends not only on system design but also on institutional readiness, digital literacy development, and inclusive implementation strategies.

5. Conclusion and Recommendations

5.1 Conclusion

Conclusively, personalised learning through the Learning Management System (LMS) plays an important role in supporting curriculum implementation at Kyambogo University, although its influence is shaped by both enabling features and existing constraints. Descriptive results show strong agreement among students that the LMS supports personalised learning through flexible access to resources, self-paced learning, goal setting, timely feedback, and the use of diverse multimedia materials. This means that learners value autonomy and flexibility provided by the LMS, which allows them to tailor learning experiences to their individual preferences, abilities, and schedules. However, its effectiveness depends on reliable infrastructure, inclusive system design, skilled users, and consistent instructional support. Strengthening institutional capacity, improving accessibility, and enhancing digital support systems are essential for maximising the contribution of personalised learning to effective and equitable curriculum implementation in higher learning institutions.

5.2 Recommendations

From the findings, the following are the recommendations

1. Institutional leaders should allocate adequate resources towards improving digital infrastructure, ensuring reliable internet connectivity, and maintaining LMS platforms to enable effective curriculum implementation. These investments enhance learner access to flexible, learner-centred educational experiences supported by digital technologies.
2. Enhance the digital competencies of lecturers and students. Higher learning institutions should provide continuous professional development and digital literacy training for lecturers and students to strengthen their capacity to utilize personalized learning features available within LMS platforms.
3. Improve accessibility and inclusivity of LMS-supported learning. University management should ensure that Learning Management Systems are accessible to all learners by addressing barriers related to affordability, internet availability, disability inclusion, and device accessibility.
4. Integrate personalized learning into curriculum planning and instructional practice. Curriculum developers and university academic units should embed personalized learning principles within curriculum design, delivery, and assessment by incorporating adaptive learning pathways, flexible assessment strategies, and learner-centred instructional approaches.

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