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Improving Distance Learning Students' Retention: The Role of Students' Satisfaction through Self-Determination Theory Principles

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Abstract

These factors affect students' retention in open online flexible distance learning environments, focusing on performance feedback, lecturer quality, course design, and academic support services. Understanding retention is crucial as it impacts educational outcomes and institutional success. The study uses Self-Determination Theory as the theoretical basis to investigate how these elements, mediated by student satisfaction, influence retention. Data was gathered through a survey distributed to distance learning students, yielding 433 valid responses for analysis. Structural Equation Modeling (SEM) via Smartpls4 was used for data analysis due to its efficiency with complex multivariate data. Hypotheses testing showed that while performance feedback had a less significant direct effect, lecturer quality, course design, and academic support services substantially impacted student satisfaction and retention. Student satisfaction emerged as a critical mediator with the most significant effect on retention. The study suggests that future research should investigate integrating advanced technologies like AI to enhance feedback and engagement in distance learning. Comparative studies in diverse educational settings could deepen understanding of cultural influences on retention, while longitudinal studies might reveal the

long-term effects of these strategies. The study's implications are significant for educators and policymakers, guiding efforts to enhance retention rates by improving lecturer quality, course design, and support services while focusing on student satisfaction.
Keywords: Performance Feedback, Lecturer Quality, Course Design, Academic Support Services, Students' Retention, Students' Satisfaction

Introduction

Student retention in higher education institutions (HEIs) is critical for academic success, institutional reputation, and financial sustainability (Shah et al., 2021). Retention rates are often used as a benchmark for institutional quality, influencing policy decisions and funding (Thomas et al., 2021). Globally, retention has been challenged by diverse factors, including economic pressures, mental health issues, and the shift to online learning, particularly post-COVID-19 (Swani et al., 2022). Despite the increased attention, research gaps remain, especially regarding how to address retention strategically across diverse contexts (Kebah et al., 2019). While existing studies have explored aspects such as student support systems and community building, there is a significant need to delve deeper into personalized retention strategies and adaptive learning environments (Seery et al., 2021). Machine learning and data analytics present the untapped potential for predicting at-risk students and tailoring interventions, as evidenced by studies in Chile utilizing data mining techniques (Palacios et al., 2021; Trivedi, 2022). One major challenge lies in the gap between identifying at-risk students and effective intervention. Factors influencing retention extend beyond academic performance, involving psycho-social support and engagement in campus life (Nieuwoudt & Pedler, 2023). This highlights the need for HEIs to foster environments that consider students' complex lives and unique circumstances (Stone et al., 2022). For policymakers and HEIs, understanding these dynamics is vital for implementing effective retention strategies that enhance student success and institutional performance (Bukhatir et al., 2023). For students, improved retention efforts can lead to better support systems, reducing dropout rates and improving academic outcomes. Thus, a holistic, data-driven approach to retention can serve as a significant advancement for all stakeholders involved, paving the way for future innovations in educational support and strategy development. This study assesses the direct and indirect relationship between performance feedback, lecturer quality, course design, academic support services, and students' retention and satisfaction as mediators in open online flexible distance learning higher education institutions.

Literature Review

Underpinning Theory

Self-determination theory (SDT), developed by Deci and Ryan (1985), provides a robust framework for understanding motivation, particularly how environmental factors can foster or hinder intrinsic motivation in educational settings (Deci & Ryan, 1985). SDT is based on the premise that human motivation is driven by a need to fulfill three basic psychological needs: autonomy, competence, and relatedness. These needs can significantly impact students' retention and satisfaction in open online flexible distance learning. Autonomy refers to the feeling of being in control of one's actions. This need can be supported in an educational setting through flexible course design that allows students to tailor their learning experiences (Ryan & Deci, 2000). Competence, or being effective and capable, can be enhanced through constructive performance feedback and high-quality instruction, enabling students to feel skilled and confident in their academic pursuits. Relatedness, or the connection to others, can

be fostered through supportive academic environments and accessible lecturer interactions, making students feel part of a learning community even in a distance learning setting. These components of SDT can mediate the relationship between academic support services, course design, and student satisfaction and retention. By addressing these intrinsic needs, institutions can enhance students' motivation to learn, increasing their likelihood of persisting in their studies (Niemiec & Ryan, 2009). Understanding how these elements contribute to student motivation and outcomes provides invaluable insights for improving educational strategies, making SDT a suitable underpinning theory for this study.

Relationship between Academic Support Service, Students' Satisfaction & Students' Retention

The relationship between academic support and student retention is significantly influenced by student satisfaction, which serves as a mediator in the educational experience. Academic support services, ranging from tutoring and advising to technical assistance, are critical in enhancing students' academic efficacy and satisfaction (Sharif Nia et al., 2023). Adequate academic support provides students with the resources to overcome challenges, fostering a more satisfactory educational experience. Student satisfaction, in turn, is a pivotal determinant of retention (Kebah et al., 2019). When students are satisfied with their academic environment, they are more likely to feel committed to their educational institution and continue their studies (Nashaat et al., 2021). Satisfaction integrates various aspects of the academic experience, including the quality of instruction and the effectiveness of support services, contributing to students' perceived value of their education (Chang & Chou, 2021). Furthermore, satisfaction can mediate the effects of academic motivation and engagement on retention. Pham et al. (2024) highlight that motivation and self-efficacy are augmented by satisfaction, enhancing engagement and retention rates. Therefore, enhancing academic support services can lead to higher satisfaction, positively impacting student retention by increasing commitment and academic success (McNaughton-Cassill et al., 2021). This mediated relationship underscores the importance of supportive educational environments to improve satisfaction and retention outcomes. Therefore, the following hypotheses were proposed for this study:

H1: There is a relationship between academic support services and students' retention in open online flexible distance learning higher education institutions.

H2: There is a relationship between academic support services and students' satisfaction in open online flexible distance learning higher education institutions.

H3: There is a mediating effect of students' satisfaction on the relationship between academic support services and students' retention in open online flexible distance learning higher education institutions.

Relationship between Course Design, Students' Satisfaction, Students' Retention

Student satisfaction significantly mediates the relationship between course design and student retention. Well-structured course design, which incorporates clear objectives, engaging materials, and interactive components, enhances student satisfaction and retention rates (Li et al., 2020). Effective course design ensures that students are motivated and engage meaningfully with the content, leading to higher academic efficacy and satisfaction (Sharif Nia et al., 2023). Student satisfaction plays a critical mediating role, reflecting the students' overall contentment with their learning experience (Osman et al., 2018). This satisfaction is crucial in enhancing retention, as satisfied students are likelier to continue their studies and

recommend the program to others (Leoparjo et al., 2023). Satisfaction bridges the gap between high-quality course design and retention by providing a positive learning environment that meets students' educational needs. Moreover, when designed effectively, technology-enhanced learning environments increase perceived benefits and student satisfaction, further boosting retention rates (Dubey & Sahu, 2022). Similarly, well-designed courses supported by robust information technology frameworks enhance student satisfaction in MOOCs, serving as mediators in the retention process (Khan et al., 2021). Thus, focusing on course design that prioritizes student engagement and satisfaction can significantly impact retention in online and traditional education settings. Thus, the following hypotheses were proposed for this study:

H4: There is a relationship between course design and students' retention in open online flexible distance learning higher education institutions.
H5: There is a relationship between course design and students' satisfaction in open online flexible distance learning higher education institutions.
H6: There is a mediating effect of students' satisfaction on the relationship between course design and students' retention in open online flexible distancelearning higher education institutions.

Relationship between lecturers' Quality, Students' Satisfaction, Students' Retention

The relationship between lecturer quality and student retention is significantly influenced by student satisfaction, which acts as a mediator. High-quality lecturers, characterized by expertise, enthusiasm, and practical communication skills, can significantly enhance student satisfaction by meeting or exceeding students' expectations (Geier, 2021). When students perceive their lecturers as knowledgeable and supportive, their overall satisfaction with the educational experience increases, fostering a sense of belonging and commitment to the institution (Intaratat et al., 2024). Student satisfaction subsequently enhances retention rates, as satisfied students are more likely to remain enrolled and engage positively with their studies (Al et al., 2022). This satisfaction is a crucial link between lecturer quality and retention, as it influences students' attitudes and behaviors towards their educational journey. Furthermore, lecturer presence and engagement on online platforms can enhance student satisfaction and, by extension, retention (Jain et al., 2023). Innovative pedagogies and the incorporation of technology in teaching further augment the impact of lecturer quality on student satisfaction and loyalty (Susilawati et al., 2021). Institutions focusing on improving lecturer quality can boost student satisfaction, which plays a mediating role in achieving higher retention rates, ensuring both academic success and institutional reputation (Santika et al., 2021). Hence, the following hypotheses were proposed for this study:

H7: There is a relationship between lecturers' quality and students' retention in open online flexible distance learning higher education institutions.
H8: There is a relationship between lecturers' quality and students' satisfaction in open online flexible distance learning higher education institutions.
H9: There is a mediating effect of students' satisfaction on the relationship between lecturers' quality and students' retention in open online flexible distance learning higher education institutions.

Relationship between Performance Feedback, Students' Satisfaction, Students' Retention

Performance feedback plays a crucial role in student retention, with satisfaction as a critical mediating factor. Effective feedback gives students insights into their strengths and areas for improvement, enhancing their learning experience and fostering academic satisfaction (Geier, 2021). When students receive constructive feedback, they are more likely to feel competent and motivated, contributing to their overall satisfaction with their education (Sánchez-Cardona et al., 2021). This satisfaction, in turn, significantly influences their decision to remain enrolled in their academic programs. Satisfied students are more engaged and committed, leading to higher retention rates (Jain et al., 2023). Moreover, feedback that supports a learning goal orientation can foster psychological capital, further enhancing academic satisfaction and performance (Fisher et al., 2021). Additionally, integrating feedback mechanisms into online and blended learning environments can boost student satisfaction and retention. When feedback is timely and relevant, it helps build a supportive learning environment that encourages continuous student engagement (Otero et al., 2021). Thus, the relationship between performance feedback and retention is strongly mediated by satisfaction, highlighting the importance of providing meaningful and practical feedback to support student success and persistence in educational settings. Therefore, the following hypotheses were proposed for this study:

H10: There is a relationship between performance feedback and students' retention in open online flexible distance learning higher education institutions.

H11: There is a relationship between performance feedback and students' satisfaction in open online flexible distance learning higher education institutions.

H112: There is a relationship between students' satisfaction and students' retentionin open online flexible distance learning higher education institutions.

H13: There is a mediating effect of students' satisfaction on the relationship between performance feedback and students' retention in open online flexible distance learning higher education institutions.

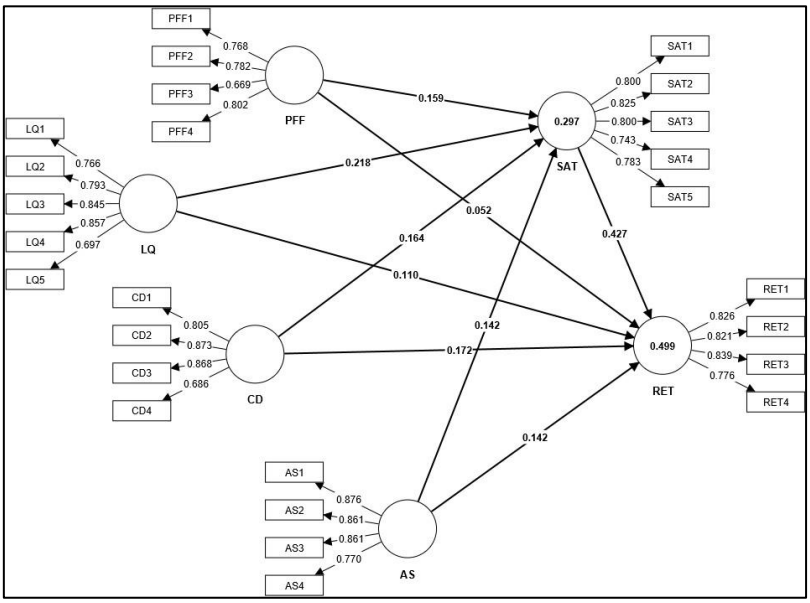

Figure 1: Research Model

Notes: PFF=Performance Feedback LQ=Lecturer Quality CD=Course Design AS=Academic Support Services Sat=Satisfaction RET=Retention

Methodology

The study aimed to thoroughly evaluate the direct effects of student satisfaction, timely feedback, lecturer quality, course design, and academic support services on student retention within open online flexible distance learning higher education institutions. To accomplish this, researchers conducted surveys to gather primary data, using reliable and valid measures selected through an extensive review of prior studies. Surveys were distributed via email to participants chosen through purposive sampling due to the lack of a complete population list. The study examined 26 observed variables, including exogenous ones such as academic support services (adopted from Joseph & Blair, 2011; 4 items), course design (adopted from Bangert, 2004; 4 items), lecturer quality (adopted from Bangert, 2004; 5 items), timely feedback (adopted from Bangert, 2004; 4 items), and the mediator, student satisfaction (adopted from Bangert, 2004; 5 items). The endogenous variable, student retention, was adopted from Alison (2004; 4 items). Participants rated each construct element on a Likert scale with five options, from strongly disagree to strongly agree. Of the 588 surveys sent out, 476 were returned, achieving a robust response rate of 81%, appropriate for structural equation modeling (SEM) analysis. From these, 433 responses were deemed clean and suitable for analysis. Researchers used Smartpls4 software for data analysis and hypothesis testing due to its strong capacities in SEM and multivariate data analysis, consistent with the study's objectives and the guidelines recommended by Ringle et al. (2022). Smartpls4 facilitated an in-depth evaluation of the proposed hypotheses and a comprehensive assessment of the measurement and structural models.

Data Analysis

Respondents' Profile

Based on the provided data, analyzing the respondents' profiles highlights several significant trends. For gender, there are 156 male respondents, constituting 36.0% of the sample, whereas 277 female respondents make up 64.0%, demonstrating a predominance of females in the sample. Concerning age distribution, the largest group comprises 195 respondents (45.0%) under 30. The 31 – 40-year-old category includes 172 respondents, accounting for 39.7% of the sample. Those in the 41 – 50 age bracket number 56, or 12.9%, while the groups of 51 – 60 years and over 60 years consist of 6 (1.4%) and 4 (0.9%) respondents, respectively. Regarding academic years, 125 respondents (28.9%) are in their first year, and 76 (17.6%) are in their second year. Third-year students total 112, making up 25.9% of the sample, with fourth-year students numbering 71 (16.4%). Fifth-year students are 22 (5.1%), and those in studies exceeding five years are 27 (6.2%). Regarding their level of study, 61 respondents (14.1%) are at the diploma level, while a significant portion, 273 (63.0%), are pursuing a bachelor's degree. There are 34 respondents in postgraduate diploma programs (7.9%), 56 at the master's level (12.9%), and nine doctorate candidates (2.1%). The data indicates that most respondents are females under 30, in their first or third year of study, and pursuing a bachelor's degree.

Common Method Bias

Kock (2015) and Kock & Lynn (2012) proposed a comprehensive methodology for conducting a collinearity test, which examines both vertical and horizontal collinearity aspects. If variance inflation factors (VIFs) exceeds 3.3, it indicates pathological collinearity, suggesting a significant issue with common method bias in the model (Kock & Lynn, 2012). Consequently, if the VIFs from the detailed collinearity evaluation are under 3.3, it can be inferred that the

model lacks common method bias (Kock, 2015). According to Table 1, the VIFs from the overall collinearity assessment were below 3.3, confirming that common method bias is not present in the model.

Table 1
Full Collinearity Test

	RET	PFF	LQ	CD	AS	SAT
RET		2.472	2.530	2.558	2.568	1.422
PFF	1.424		1.480	1.480	1.480	1.383
LQ	1.104	1.121		1.090	1.105	1.120
CD	1.273	1.278	1.243		1.099	1.260
AS	1.246	1.246	1.229	0.933		1.241
SAT	1.483	2.505	2.680	0.378	2.669	

Measurement Model

In this study, the methodology suggested by Hair et al. (2017) was employed to evaluate each measurement at both the first and second-order levels, focusing on identifying items with loadings below the 0.7 thresholds. The analyses of construct reliability and validity indicated that the Average Variance Extracted (AVE) for all constructs varied from 0.573 to 0.711, exceeding the 0.5 benchmark and demonstrating strong convergent validity (Hair et al., 2017) (see Table 2). Additionally, composite reliability for all constructs was above 0.7, ranging from 0.752 to 0.876. Cronbach's alpha values for all constructs also surpassed 0.7, ranging from 0.749 to 0.863 (Table 2). To ensure discriminant validity, the initial evaluation assessed cross-loadings to confirm that the constructs were adequately represented and measured (Table 2). Subsequently, the Heterotrait-Monotrait (HTMT) ratio was applied for further assessment, following the recommended guidelines for evaluating discriminant validity in Variance-Based Structural Equation Modeling (VB-SEM) (Henseler et al., 2015). Table 3 shows the HTMT ratios, original sample, and 95% confidence intervals, confirming adherence to the HTMT threshold 0.85.

Table 2
Construct Reliability and Validity & Item Loadings

Constructs	Items	Loadings	CA	CR	AVE
Academic	AS1	0.876	0.863	0.864	0.711
Support	AS2	0.861			
Services	AS3	0.861			
	AS4	0.770			
Course	CD1	0.805	0.824	0.834	0.659
Design	CD2	0.873			
	CD3	0.868			
	CD4	0.686			
lecturer	LQ1	0.766	0.853	0.876	0.630
Quality	LQ2	0.793			
	LQ3	0.845			
	LQ4	0.857			
	LQ5	0.697			
Performance	PFF1	0.768	0.749	0.752	0.573

Feedback	PFF2	0.782			
	PFF3	0.669			
	PFF4	0.802			
Retention	RET1	0.826	0.833	0.838	0.666
	RET2	0.821			
	RET3	0.839			
	RET4	0.776			
Satisfaction	SAT1	0.800	0.850	0.853	0.625
	SAT2	0.825			
	SAT3	0.800			
	SAT4	0.743			
	SAT5	0.783			

Notes: CA=Cronbach Alpha CR=Composite Reliability AVE=Average Variance Extracted

Table 3
Hetrotrait-Monotrait (HTMT) Ratios

	AS	CD	LQ	PFF	RET
CD	0.497				
LQ	0.441	0.762			
PFF	0.481	0.631	0.771		
RET	0.504	0.614	0.585	0.561	
SAT	0.417	0.525	0.548	0.538	0.743

Structural Model

In this study, the structural model evaluation adhered to the methodology described by Hair et al. (2017), involving a detailed examination of pathway coefficients (β) and coefficients of determination (R^2). The Partial Least Squares (PLS) approach was utilized, with 5000 sub-samples used to ascertain the significance of path coefficients. The results from hypothesis testing, including the confidence intervals for path coefficients (beta), associated t-statistics, and p-values, are detailed in Table 4. This comprehensive analysis provides significant insights into the strength and robustness of the relationships among the variables within the structural model. The extensive hypothesis testing results showcased in Table 4 deliver an in-depth analysis of each hypothesis, emphasizing Beta coefficients, T-statistics, P-values, and the final determinations regarding hypothesis support, thereby enriching the depth and clarity of the study's findings.

The analysis of the 13 hypotheses provides detailed insights into the relationships among academic support services, course design, lecturer quality, performance feedback, student satisfaction, and student retention. Starting with *H1*, the pathway from academic support service to student retention shows a beta value of 0.142 with a t-statistic of 2.811 and a p-value of 0.005, leading to the acceptance of the hypothesis, indicating that academic support significantly impacts retention. *H2* similarly indicates that academic support services significantly enhance student satisfaction, with a beta of 0.142, a t-statistic of 3.123, and a p-value of 0.002, supporting acceptance. This positive relationship extends through *H3*, where academic support service enhances retention indirectly via student satisfaction, confirmed by a beta of 0.061, a t-statistic of 2.927, and a p-value of 0.003, hence accepted. In course design,

H4 shows a substantial direct effect on retention, evidenced by a beta of 0.172, a t-statistic of 3.100, and a p-value of 0.002, resulting in acceptance.

H5 reveals course design's significant influence on satisfaction with a beta of 0.164, t-statistic of 2.980, and p-value of 0.003, leading to acceptance. *H6* also affirms the indirect impact of course design on retention via satisfaction, with a beta of 0.070, t-statistic of 2.828, and p-value of 0.005, and is accepted. Lecturer quality's impact is apparent in *H7*, impacting student retention with a beta of 0.110, t-statistic of 2.033, and p-value of 0.042, resulting in acceptance. *H8* shows lecturer quality substantially affects satisfaction, demonstrated by a robust beta of 0.218, t-statistic of 3.617, and p-value of 0.000, leading to the hypothesis being accepted, which also supports the mediation effect in *H9*, where lecturer quality enhances retention through satisfaction (beta=0.093, t-statistic=3.412, p-value=0.001), hence accepted.

An exception is seen in *H10*, where performance feedback's impact on retention is insignificant, with a beta of 0.052, t-statistic of 1.009, and p-value of 0.313, leading to rejection. Nevertheless, performance feedback significantly boosts satisfaction, as per *H11*, with a beta of 0.159, a t-statistic of 2.921, and a p-value of 0.004, resulting in acceptance. *H12* demonstrates a strong direct relationship between satisfaction and retention, with the highest beta of 0.427, t-statistic of 9.503, and p-value of 0.000, confirming its acceptance. Finally, *H13* reveals that performance feedback indirectly influences retention through satisfaction, supported by a beta of 0.068, t-statistic of 2.658, and p-value of 0.008, thus accepted. These findings underscore the critical mediating role of student satisfaction in enhancing retention across various educational inputs. The summary of the hypotheses testing results is shown in Table 4.

Table 4
Hypotheses Testing Results

Hypotheses	Path	T-statistics	P-values	2.50%	97.50%	Decision
H1: AS -> RET	0.142	2.811	0.005	0.039	0.238	*Accepted*
H2: AS -> SAT	0.142	3.123	0.002	0.052	0.226	*Accepted*
H3: AS -> SAT -> RET	0.061	2.927	0.003	0.022	0.104	*Accepted*
H4: CD -> RET	0.172	3.100	0.002	0.061	0.283	*Accepted*
H5: CD -> SAT	0.164	2.980	0.003	0.050	0.268	*Accepted*
H6: CD -> SAT -> RET	0.070	2.828	0.005	0.022	0.119	*Accepted*
H7: LQ -> RET	0.110	2.033	0.042	0.002	0.213	*Accepted*
H8: LQ -> SAT	0.218	3.617	0.000	0.094	0.333	*Accepted*
H9: LQ -> SAT -> RET	0.093	3.412	0.001	0.042	0.148	*Accepted*
H10: PFF -> RET	0.052	1.009	0.313	-0.047	0.159	*Rejected*
H11: PFF -> SAT	0.159	2.921	0.004	0.051	0.265	*Accepted*
H12: SAT -> RET	0.427	9.503	0.000	0.339	0.515	*Accepted*
H13: PFF -> SAT -> RET	0.068	2.658	0.008	0.021	0.121	*Accepted*

Notes: significant p<0.05

Effect Sizes (f^2) & Variance Inflation Factor (VIF)
The effect sizes (f^2), assessed independently of the sample size, align with Cohen's criteria (1992), which classify effect sizes as small (0.020 to 0.150), medium (0.150 to 0.350), or large

(0.350 or greater). In this research, the effect sizes observed ranged from small (0.003) to large (0.256). As depicted in Table 5, all Variance Inflation Factor (VIF) values were below the acceptable threshold of 5, with the highest being 1.876. This indicates a permissible level of collinearity, allowing for valid comparisons and interpretations of the coefficients in the structural model. The explained variance for the endogenous construct is significant, with an R^2 value of 0.499, as shown in Figure 1. Regarding the mediator, the model accounted for approximately 29.7% of the variance, evidenced by an R^2 value of 0.297.

Table 5
Effect Sizes (f^2) & Variance Inflation Factor (VIF)

Constructs	f^2		VIF	
	RET	SAT	RET	SAT
AS	0.031	0.022	1.321	1.292
CD	0.031	0.021	1.876	1.838
LQ	0.011	0.031	2.239	2.172
PFF	0.003	0.021	1.790	1.754
SAT	0.256		1.422	

PLSpredicts & Cross-Validated Predictive Ability Test (CVPAT)

The model's inferences and management recommendations were evaluated through an out-of-sample predictive analysis using the PLSpredict approach, as introduced by Shmueli et al. (2016, 2019). Referring to Table 6, PLS-SEM exhibited superior Q^2 predictions (>0) in comparison to naive mean predictions and consistently demonstrated lower RMSE values than those benchmarks of a linear model (LM), highlighting its strong predictive power. Furthermore, in seven out of nine cases, the RMSE values for PLS-SEM predictions were lower than those of the linear model benchmark, emphasizing the model's predictive effectiveness, as shown in Table 6. The Cross-Validated Predictive Ability Test (CVPAT), introduced by Hair et al. (2022), alongside the application of PLSpredict analysis by Liengaard et al. (2021), is noteworthy. Table 7 confirms the superior predictive capabilities of PLS-SEM, revealing lower average loss values when compared to indicator averages and LM benchmarks, thus demonstrating its enhanced predictive performance.

Table 6
PLSpredicts

	Q^2predict	PLS-RMSE	LM_RMSE	PLS-LM
RET1	0.301	0.614	0.618	-0.004
RET2	0.244	0.621	0.623	-0.002
RET3	0.251	0.676	0.686	-0.010
RET4	0.127	0.733	0.735	-0.002
SAT1	0.194	0.631	0.627	0.004
SAT2	0.191	0.631	0.64	-0.009
SAT3	0.153	0.656	0.658	-0.002
SAT4	0.141	0.681	0.694	-0.013
SAT5	0.194	0.616	0.615	0.001

Table 7
Cross-Validated Predictive Ability Test (CVPAT)

	Average loss difference	t-value	p-value
RET	-0.132	6.279	0.000
SAT	-0.087	5.104	0.000
Overall	-0.107	6.86	0.000

The Importance-Performance Map Analysis (IPMA), guided by Ringle and Sarstedt (2016) and Hair et al. (2018), underscores the need to focus on constructs with low importance and performance, such as "Performance Feedback" (total effect 0.120, performance 66.931), to improve overall student retention. Improving this area involves enhancing the timeliness and relevance of the feedback. Institutions can implement digital tools for regular, personalized feedback and train educators on effective feedback strategies. By increasing the quality and frequency of performance feedback, students feel more supported and informed, leading to higher satisfaction and retention despite its current low impact and performance scores in IPMA.

Table 8
Importance-Performance Map Analysis (IPMA)

Constructs	Total Effect	Performance
AS	0.203	66.977
CD	0.242	63.853
LQ	0.203	66.425
PFF	0.120	66.931
SAT	0.427	61.216

Discussion & Conclusion

Discussion

Open distance learning higher education institutions can significantly enhance student retention by employing a multifaceted approach that improves performance feedback, lecturer quality, course design, and academic support services, with student satisfaction serving as a critical mediating factor. According to the hypotheses testing results, performance feedback, although marked by a lower beta value of 0.120, can be maximized through strategic practices such as providing timely, constructive, and personalized feedback utilizing digital platforms, which, despite its statistical limitations, can enrich the learning environment and contribute indirectly to retention through heightened student satisfaction (Jain et al., 2023). Concurrently, lecturer quality has demonstrated a notable influence, with a beta value of 0.218 on student satisfaction. It indicates that continuous professional development and training in digital pedagogies for lecturers could further improve their competencies and teaching effectiveness (Geier, 2021). This enhancement fosters a supportive learning atmosphere essential for student engagement and satisfaction and is pivotal for retention (Al Hassani & Wilkins, 2022). Course design, exhibiting a beta effect of 0.164 on satisfaction, necessitates the integration of interactive and flexible components that accommodate diverse learning needs, ensuring that courses are engaging and rewarding (Fisher et al., 2021). This method solidifies subject mastery and increases students' perceived value of their education. Furthermore, strengthening academic support services, which have been shown to have a beta of 0.142 in satisfaction and retention, is critical. Institutions should

offer robust support systems, including accessible tutoring, counseling, and technical assistance, which address students' needs effectively and promote a positive educational experience (Sharif Nia et al., 2023). By targeting these areas with a strong emphasis on improving student satisfaction a construct with the highest beta impact on retention at 0.427 — institutions can create a holistic and satisfying educational environment. This environment nurtures ease and readiness to change among faculty and staff, further enriching the teaching and learning experience and substantially improving retention outcomes through strategic student-centred innovations.

Theoretical Implications

The theoretical implications of the study, grounded in Self-Determination Theory (SDT) by Deci and Ryan (1985), emphasize the pivotal role of enhancing intrinsic motivation by addressing students' fundamental psychological needs for autonomy, competence, and relatedness within open online flexible distance learning environments. This study's findings align with SDT, demonstrating that factors such as performance feedback, lecturer quality, and course design significantly influence student satisfaction and retention by fulfilling these psychological needs. Performance feedback underscores the need for timely, constructive feedback tailored to promote students' sense of competence, enhancing satisfaction despite its limited statistical significance (Jain et al., 2023). Lecturer quality directly impacts satisfaction by fostering a supportive and engaged learning environment that caters to students' need for relatedness (Geier, 2021). Moreover, effective course design provides autonomy by allowing students to engage with the material flexibly, thus enhancing their intrinsic motivation and overall satisfaction (Fisher et al., 2021). Academic support services are crucial for empowering students to navigate academic challenges independently, further meeting their needs for competence and relatedness (Al Hassani & Wilkins, 2022). By strategically improving these educational elements, institutions can amplify student satisfaction, a key mediator in retention, and foster a learning environment conducive to intrinsic motivation and, ultimately, increased retention (Sharif Nia et al., 2023). This alignment with SDT underscores the theory's viability in guiding educational strategies to optimize student experiences in distance learning contexts.

Practical Implications

The study's practical implications underscore the importance of open online flexible distance learning institutions to enhance key educational elements to improve student retention through increased satisfaction. Improving performance feedback by making it timely and actionable can lead to heightened student competence and engagement, which is crucial for retention (Jain et al., 2023). Lecturer quality should be enhanced through continuous professional development programs, ensuring instructors have the skills to create a supportive and engaging learning environment, thus meeting students' relatedness needs (Geier, 2021). Furthermore, thoughtful course design should offer flexibility and interactivity, aligning with students' autonomy needs and fostering intrinsic motivation (Fisher et al., 2021). Institutions should also prioritize robust academic support services, which are vital for helping students navigate academic challenges, thereby enhancing their overall satisfaction and retention. By focusing on these areas, institutions can create an invigorating learning environment that aligns with the principles of Self-Determination Theory, promoting autonomy, competence, and relatedness among students. These improvements bolster student satisfaction and equip students with the motivation to persist in their studies, leading

to better educational outcomes and a more resilient student body. Implementing these strategies is essential for maximizing the retention of students in distance learning settings.

Suggestions for Future Study

Future expands on this study by exploring the role of technology in enhancing the constructs of performance feedback, lecturer quality, and course design, particularly in open online flexible distance learning contexts. Investigating innovative technologies such as artificial intelligence and machine learning can provide insights into personalized learning experiences and feedback mechanisms that cater to individual student needs. Additionally, future studies could examine the longitudinal effects of enhanced academic support services on student retention and satisfaction over time to identify sustained impacts. It would also be beneficial to conduct comparative studies across different cultural and educational settings to understand how these constructs vary globally and assess the applicability of Self-Determination Theory in diverse environments. Finally, exploring additional mediating variables, such as student engagement or emotional well-being, could offer a more comprehensive understanding of the factors influencing student retention, providing deeper insights for educators and policymakers.

Conclusion

The study highlights the crucial role of enhancing performance feedback, lecturer quality, course design, and academic support services to boost student retention in open online flexible distance learning institutions. Aligning these factors with Self-Determination Theory principles, which focus on fulfilling students' needs for autonomy, competence, and relatedness, can significantly enhance student satisfaction—a critical mediator in fostering retention. The findings show that when students perceive their educational environment as supportive and engaging, their motivation to persist in their studies increases substantially. Contextually, this study underscores the relevance of adaptable educational frameworks in the evolving landscape of higher education, especially as institutions adopt more online and flexible learning models. Educators can use these insights to tailor their approaches to meet diverse student needs, fostering inclusive and compelling learning experiences. Additionally, the study provides valuable guidance for policymakers aiming to improve student success through targeted interventions within distance learning paradigms. As the demand for flexible learning grows, these strategic enhancements will be essential for maintaining student engagement and ensuring educational success in a rapidly changing academic environment.

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