



Effect of Online Classes on Academic Performance of Nursing Mothers in Public Universities in Rivers State

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Abstract

Background and Aims: Nursing mothers in public universities often face significant challenges in balancing academic responsibilities with childcare duties, which can negatively affect their participation and academic performance. The emergence of online learning offers a flexible alternative that may help address these constraints by enabling continuous engagement in academic activities. This study examined the effect of online classes on the academic performance of nursing mothers in public universities in Rivers State, Nigeria.

Methodology: A survey research design was adopted. The study population comprised nursing mothers at public universities in Rivers State, from whom 103 respondents were selected using snowball sampling. Data were collected using a self-structured questionnaire, while academic performance was measured using students' CGPA. The instrument was validated and yielded a reliability coefficient of 0.93. Data analysis involved mean, standard deviation, logistic regression, and a z-test at a 0.05 level of significance.

Results: The findings revealed that online classes enhance academic performance by promoting personalized learning and improving access to academic materials. However, challenges such as poor time management, inadequate infrastructure, and limited technological skills were identified. Logistic regression analysis showed a significant relationship between online learning variables and academic performance, with digital skillfulness, access to devices, and engagement time as key predictors. Additionally, no significant difference was found between married and single nursing mothers regarding perceived benefits and challenges.

Conclusion: The study concluded that online learning positively influences the academic performance of nursing mothers by providing flexibility and opportunities for personalized learning. Nevertheless, its effectiveness depends on access to digital resources, technological competence, and supportive infrastructure, which must be improved to maximize its benefits.

Keywords: Academic Performance, Nursing Mothers, Students, Universities, Online Classes

Introduction

Technological advancement around the world is revamping the way essential services, including education, are delivered. In most Higher Education Institutions (HEIs), online classes have become the norm to ensure continuous teaching and learning. While this development benefits many students, it is particularly relevant for nursing mothers whose lived realities are shaped by time constraints, childcare responsibilities, mobility limitations, fatigue, and, in many cases, the absence of institutional childcare support. Anyanwu et al. (2021) demonstrate that the acquisition of digital literacy skills among academic stakeholders is a critical prerequisite for navigating these modern delivery systems, especially for those balancing domestic and academic roles.

Currently, most HEIs are without childcare units, and the ability of nursing mothers to attend classes physically is hindered. Nursing mothers must combine academic work with infant care, breastfeeding, and household responsibilities. The rigid schedule of traditional classroom learning often conflicts with feeding routines, medical appointments, and childcare emergencies. Physical presence on campus may also be constrained by transportation challenges and the lack of flexible attendance policies. Adekola (2018) argues





that the role conflict experienced by women in Nigerian tertiary institutions, where maternal duties clash with rigid academic schedules, is a significant predictor of burnout and decreased instructional engagement.

As a result, these students continue to seek alternative ways of meeting their educational needs amidst these constraints. Online teaching and learning appear to offer a practical solution by enabling nursing mothers to engage in educational activities from the comfort of their homes while attending to childcare duties. Yusuf (2021) notes that the digital transition in Nigerian higher education, accelerated by the post-pandemic era, has opened new windows for "flexible learning" that accommodate non-traditional students.

However, whether this flexibility translates into improved academic performance remains insufficiently examined, especially within public university contexts in Rivers State. Owan et al. (2022) emphasize that while technology provides the platform, the ultimate academic attainment of a student is a product of both school-based variables and the home environment. For nursing mothers in Rivers State, the effectiveness of online learning is often mediated by local factors such as erratic power supply and the digital divide, which Adeyeye and Afolabi (2020) identify as a persistent barrier to equitable research and learning opportunities across Nigerian geo-political zones.

Objectives of the Study

The study aimed to examine the effect of web-based learning on the academic performance of nursing mothers in Public Universities in Rivers State. The specific objectives of the study were to:

1. Describe the perceived benefits of online classes for improved academic performance of nursing mothers in public Universities in Rivers State.
2. Determine the association between online classes and the academic performance of nursing mothers in Public Universities in Rivers State.
3. Find out the perceived challenges faced by nursing mothers in the adoption of online classes for improved academic performance in public Universities in Rivers State.

Based on the objectives of the study, the following research questions were answered:

1. What are the perceived benefits of online classes for improved academic performance of nursing mothers in public Universities in Rivers State?
2. What is the association between online classes and the academic performance of nursing mothers in Public Universities in Rivers State?
3. What are the perceived challenges faced by nursing mothers in the adoption of online classes for improved academic performance in public Universities in Rivers State?

The following hypotheses were equally tested using z-test statistics at 5% level of significance:

1. Marital status is not associated with the difference in the perceived benefits derivable from online classes for improved academic performance of nursing mothers in public Universities in Rivers State.
2. Marital status is not associated with the difference in the perceived challenges faced by nursing mothers in the adoption of online classes for improved academic performance in public Universities in Rivers State.

Literature Review

Web-based learning represents a shift from teacher-centred education in the traditional classroom to a learner-centred system where the teacher and students do not need to meet physically (Haznedar & Baran, 2012). Conceptually, web-based learning may influence academic performance through several pathways. On the positive side, online learning promotes flexibility, independence, and convenience in access (Sawant & Shinde, 2012). It enables students to access course materials from any location, manage their time efficiently, and revisit recorded content where necessary. Oduntan et al. (2022) observed that web-based environments enhance interactive learning, widen access, promote social development, and improve time management. New technological applications such as simulations, interactive models, and virtual





laboratories further enrich instructional delivery (Adie et al., 2020). For nursing mothers, these features may reduce the tension between academic participation and childcare, thereby improving engagement and potentially academic achievement.

However, web-based learning may also fail to produce positive outcomes under certain conditions. Inadequate infrastructure, poor electricity supply, limited financial resources, and inequality in access to technology remain significant challenges in public university environments (Oduntan et al., 2022). In addition, inadequate learner motivation, engagement issues, and student isolation may reduce the effectiveness of online learning. While online classes close the distance gap, the ability to actively participate remains an issue. Cognitive overload from managing domestic responsibilities alongside academic tasks may further limit effective learning. Ural and Ercan (2014) even observed no significant effect of web-based learning on students' interest in some contexts.

Thus, online classes may either enhance academic performance through flexibility, access, and engagement or hinder it through infrastructural, motivational, and psychosocial constraints. The direction and magnitude of its effect among nursing mothers require empirical verification. Socio-economic changes around the world have forced HEIs to devise new ways of teaching and learning as institutions shut down during critical emergencies (Agu et al., 2021). Institutionalizing online teaching has become a sustainable and cost-effective approach to meeting the educational needs of diverse stakeholders, including lactating mothers.

Empirical studies at the university level provide mixed but generally positive evidence regarding online learning. Deloian et al. (2015) reported significant improvement in posttest scores among nursing students and nurses who participated in a web-based breastfeeding education programme in the United States. Similarly, Harnanto and Sunarto (2022) found greater knowledge improvement among nursing students exposed to web-based learning compared to control groups. Senyuva (2016) reported statistically significant improvements in students' attitudes toward internet use and web-based education after participation in online learning.

Other quasi-experimental studies, such as Baraka et al. (2018), found no statistically significant difference between web-based and traditional teaching methods in immediate posttests, suggesting that outcomes may depend on context and implementation quality. Studies conducted in Nigeria, such as Obi et al. (2025), revealed statistically significant improvements in academic performance and interest among students exposed to web-based instruction. However, Shana et al. (2023), working with primary school students, also found improved academic outcomes in the experimental group, although their population differs from university-level learners.

While these studies demonstrate the growing acceptance of technology-based teaching and its potential impact on educational outcomes, most focus on general undergraduate populations, nursing students broadly defined, or even primary school students. Very few isolate student-parents, nursing mothers, mature students, or part-time learners who face compounded responsibilities. The specific intersection between motherhood and university academic performance within web-based learning environments remains underexplored.

Despite growing evidence on the effectiveness of web-based learning in various contexts, there is little empirical evidence on how participation in online classes affects the academic performance of nursing mothers who may not always be physically present at school. Existing studies largely examine general student populations without disaggregating findings for student-mothers who operate under distinct social, cultural, and economic constraints.

In Rivers State, public universities operate within infrastructural realities characterized by electricity challenges, varying levels of internet access, and limited institutional childcare support. These contextual factors may shape how web-based learning influences academic outcomes among nursing mothers. This study, therefore, intends to examine how participation in online classes affects the academic performance



of nursing mothers in public universities in Rivers State, Nigeria. Specifically, it tests measurable academic performance outcomes while accounting for the contextual realities that may enhance or limit the effectiveness of online classes for this category of students.

Conceptual Framework

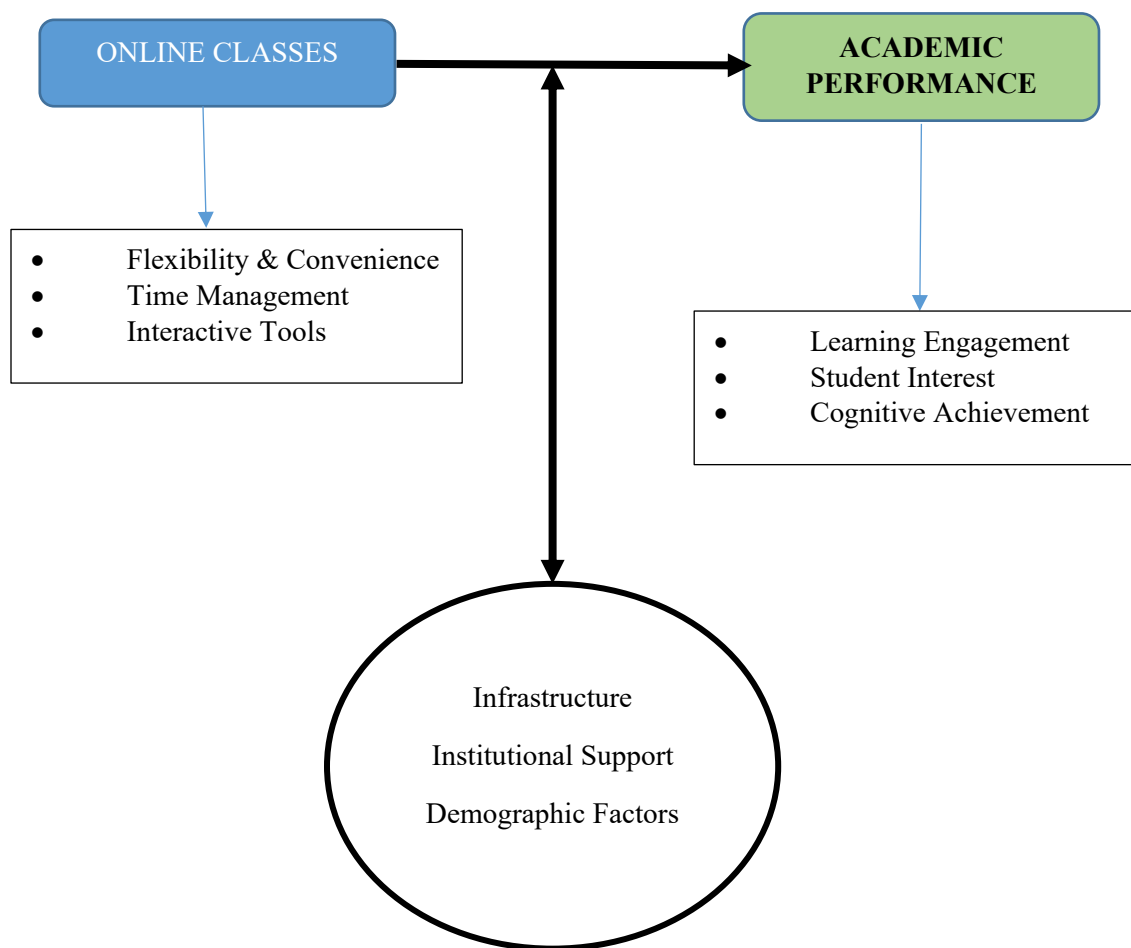


Fig. 1: Interaction between online classes and students’ academic performance
Source: Authors’ Idea (2026)

Fig. I shows the interaction between online classes, which is characterized by flexibility, time management, and access to interactive tools. These have the capacity to improve on students’ engagement, interest, and cognitive achievement. However, the extent to which this is possible is determined by intervening variables such as the quality and quantity of infrastructure available, access to institutional support, and the demographic characteristics of the user, among others. These variables must interact properly for online classes to improve students’ academic performance when adopted.

Methodology

This study adopted a survey design. The population of the study consisted of all student mothers in the three public Universities in Rivers State. However, the snowballing sampling technique was used to



sample 103 student mothers in these Universities using a convenience sampling approach, based on the accessibility and availability of the respondents during the survey. The instrument used for data gathering was a self-structured questionnaire for quantitative data gathering which was titled “Effect of Web-Based Learning on Academic Performance of Nursing Mothers Questionnaire” (EWBLAPNMQ) and was structured along the line of a four-point modified Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with values of 4, 3, 2 and 1 respectively. The instruments were face and content validated by a Measurement and Evaluation expert at the University of Port Harcourt. The questionnaire was used to gather data on the independent variable of the study, while the students' CGPA was used to measure the dependent variable (academic performance) for the purpose of analysis, and this was sourced from the students' departmental records. The threshold used was whether the students were above a second-class lower scale in their overall results. The reliability of the questionnaire was estimated as 0.93 using Cronbach's alpha statistics. Out of the 103 respondents contacted for the study, 89 were married, and 14 were single. The research questions were answered using mean, standard deviation, and logistic regression, while the z-test analysis was used to test the hypotheses at a 0.05 level of significance. However, the limitations of the study include the use of a non-random sampling technique as well as a small sample size, which makes it difficult to generalize the findings of the study.

Results

Research Question One: What are the perceived benefits of online classes for improved academic performance of nursing mothers in public Universities in Rivers State?

Table 1: Mean and Standard Deviation Scores on the Perceived Benefits of Online Classes for Improved Academic Performance of Nursing Mothers in Public Universities in Rivers State

S/No	Items	Married n=89		Single n=14		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	\bar{X}	Decision
1	Creates room for a personalized learning experience	2.83	0.88	2.94	0.91	2.89	Agree
2	Access to several academic materials for quality learning	2.85	0.87	2.80	0.95	2.83	Agree
3	Ability to network with other experts who can provide solutions to learning problems	2.76	0.91	2.92	0.93	2.84	Agree
4	A real-time solution is provided to learning problems, which saves time	2.73	0.92	2.75	0.98	2.74	Agree
5	Self-assessment can be carried out using available online resources	2.60	0.98	2.78	0.96	2.69	Agree
	Average	2.75	0.91	2.84	0.95	2.80	Agree

Table 1 shows that the respondents agreed that the perceived benefits of online classes were that it creates room for personalized learning, create access to academic materials, provide a platform to network





with other experts, provides real time solution to learning problems, and provide a platform for self-assessment.

Research Question Two: What is the association between online classes and the academic performance of nursing mothers in Public Universities in Rivers State?

Table 2a-c: Logistic Regression Analysis on the Association between Online Classes and Academic Performance of Nursing Mothers in Public Universities in Rivers State

Table 2a: Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.889	.217	16.814	1	.000	.411

Table 2b: Variables not in the Equation

Step	Variables	Score	df	Sig.
0	Access to Device	26.906	1	.000
	Skillfulness	83.477	1	.000
	Hours of Engagement	8.262	1	.004
	Overall Statistics	90.226	3	.000

Table 2c: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	.000 ^a	.547	0.825

a. Estimation terminated at iteration number 20 because a perfect fit was detected. This solution is not unique.

Table 2a-c shows that the logistic regression analysis indicated a statistically significant association between online learning variables and the academic performance of nursing mothers ($p < .001$). The Nagelkerke R^2 of 0.825 suggests that the model explains approximately 82.5% of the variance in performance, which is a robust and realistic fit for the Nigerian educational context. Among the predictors, digital skillfulness emerged as the most substantial contributor (Score = 83.477), followed by access to devices and hours of engagement, all of which significantly increase the likelihood of achieving higher CGPAs. Ultimately, the results demonstrate that while technology offers flexibility, the actual academic success of student-mothers in Rivers State is heavily dependent on their technical proficiency and consistent access to digital tools.

Research Question Three: What are the perceived challenges faced by nursing mothers in the adoption of online classes for improved academic performance in public Universities in Rivers State?

Table 3: Mean and Standard Deviation Scores on the Perceived Challenges Faced by Nursing Mothers in The Adoption of Online Classes for Improved Academic Performance in Public Universities in Rivers State

S/No	Items	Married n=89		Single n=14		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	\bar{X}	Decision
1	Problem of time management as a result	2.95	0.82	2.90	0.94	2.93	Agree





S/No	Items	Married n=89		Single n=14		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	\bar{X}	Decision
2	of childcare and learning demands Inadequate online infrastructure for sustainable online learning	2.93	0.83	2.94	0.92	2.94	Agree
3	Capital-intensive nature of online learning	2.99	0.78	2.82	0.94	2.91	Agree
4	Inadequate technological skills for online learning	2.58	0.99	2.43	1.02	2.51	Agree
5	Absence of childcare resources around the school to support nursing mothers	2.80	0.90	2.70	0.99	2.75	Agree
Average		2.85	0.86	2.76	0.96	2.80	Agree

Table 3 points out that the challenges of online learning were that there was a problem of time management due to child care activities, inadequate online infrastructure, capital intensive nature of online classes, inadequate technological skills, and the absence of childcare resources around the school.

Hypothesis One: Marital status is not associated with the difference in the perceived benefits derivable from online classes for improved academic performance of nursing mothers in public Universities in Rivers State.

Table 4: z-test Analysis that Marital Status is not Associated with the difference in the Perceived Benefits Derivable from Online Classes for Improved Academic Performance of Nursing Mothers in Public Universities in Rivers State

Variable	n	Mean	SD	df	z-cal.	z-crit.	Level of Significance	Decision
Married	89	2.75	0.91	101	0.331	1.960	0.05	Fail to Reject
Single Mother	14	2.84	0.95					

Table 4 showed that at a 0.05 level of significance and 101 degrees of freedom, the value of z-crit. A value of 1.960 was more than the value of the z-calculated of 0.331, and as such, we failed to reject the null hypothesis, and this shows that marital status is not associated with the difference in the perceived benefits derivable from online classes for improved academic performance of nursing mothers in public Universities in Rivers State.

Hypothesis Two: Marital status is not associated with the difference in the perceived challenges faced by nursing mothers in the adoption of online classes for improved academic performance in public Universities in Rivers State.





Table 5: z-test Analysis that Marital Status is not Associated with the Difference in the Perceived Challenges Faced by Nursing Mothers in the Adoption of Online Classes for Improved Academic Performance in Public Universities in Rivers State

Variable	n	Mean	SD	df	z-cal.	z-crit.	Level of Significance	Decision
Married	89	2.85	0.86	101	0.330	1.960	0.05	Fail to Reject
Single Mother	14	2.76	0.96					

Table 5 indicates that at a 0.05 level of significance and 101 degrees of freedom, the value of z-crit. A value of 1.960 was more than the value of the z-calculated of 0.330, and as such, we failed to reject the null hypothesis, and this means that marital status is not associated with the difference in the perceived challenges faced by nursing mothers in the adoption of online classes for improved academic performance in public Universities in Rivers State.

Discussion

Based on the data collected and analyzed from the students, the benefits of online learning were that it creates room for personalized learning, creates access to academic materials, provides a platform to network with other experts, provides real .time solution to learning problems, and provides a platform for self-assessment. However, challenges such as the problem of time management due to child care activities, inadequate online infrastructure, capital-intensive nature of online learning, inadequate technological skills, and absence of childcare resources around the school were issues that are left to be confronted. The logistic regression analysis reveals a statistically significant association between online learning variables and the academic performance of nursing mothers. Among the predictors, digital skillfulness emerged as the most dominant contributor to success, followed by access to devices and hours of engagement. The findings in the table on the logistic regression suggest that even before factoring in specific digital tools, these students possess an inherent drive toward high performance. According to the findings from the study, the possession of technical skills and hardware is a near-absolute necessity for academic achievement; without them, the probability of navigating the complex online learning systems utilized by public universities drops significantly. Logically, these results appear this way because nursing mothers operate under extreme time poverty and role conflict. Unlike the general student population, their ability to engage with academic content is entirely dependent on the flexibility that a personal device and high digital proficiency provide. A skillful mother can navigate these platforms) quickly during a child's short nap, whereas a less proficient student might spend that entire window struggling with login issues. The high predictive power of skillfulness and access reflects the reality that for a nursing mother, technology is not just an elective tool but a mandatory bridge that bypasses the physical and temporal barriers of the traditional classroom. From the findings of the study, one of the major challenges identified by the students is the problem of time management due to the dual demands of childcare and learning. Both married students and single students agreed on the significance of this issue, but the married students, particularly those with children, likely faced a greater challenge in balancing these responsibilities. Aligning with this finding, Velioglu and Demirci (2024) revealed in their study that there was a significant difference between groups in their motivation and self-efficacy, which may explain how they are affected by the state of the learning environment in their schools. This finding underscores the need for institutions to consider the specific circumstances of married students, especially those with childcare obligations, when designing online learning programmes. Addressing these challenges could involve offering more flexible learning schedules or providing additional support for managing family responsibilities alongside academic commitments.





Furthermore, the students agreed that the existing online infrastructure is inadequate for supporting sustainable online learning. This agrees with the result of the study by Oduntan *et al.* (2022), which identified a poor state of infrastructure and inadequate financial resources for online learning in public university environments. Issues such as slow internet speeds, unreliable platforms, and insufficient technical support were highlighted as key obstacles to effective online learning. These infrastructure challenges hinder students' ability to fully engage with course materials and participate in online discussions or assessments. Improving the quality and reliability of online infrastructure should therefore be a priority for educational institutions seeking to enhance the online learning experience for all students.

Furthermore, the students also identified the capital-intensive nature of online learning as another significant barrier. Access to devices and stable internet connections is often costly, and many students may not have the financial resources to invest in the necessary technology. Married students, in particular, might face additional financial pressures, as they may have other household expenses to consider. This finding highlights the need for institutions to provide affordable access to the required technology, such as offering subsidized devices or internet access for students in need, as well as exploring alternative funding options for those facing financial difficulties. Providing interventions assists students to improve in improving their learning outcomes (Harnanto & Sunarto, 2022). In a related manner, both the married and single students acknowledged a lack of technological skills necessary for effective engagement in online learning. Many students expressed difficulties in using online learning platforms and other digital tools that are integral to modern education. For married students, who may be older or less familiar with digital technology, these challenges could be even more pronounced. Institutions need to offer more comprehensive training and support to help students develop the necessary skills to navigate online learning environments, ensuring they can participate fully and succeed in their courses. The way students are taught will affect their learning outcomes (Baraka *et al.*, 2018), and as such, the best learning environment must be provided for improved performance.

The absence of childcare resources around the school, particularly for nursing mothers, was also identified as a challenge by both married and single students. Getting support is one way of improving the learning outcome of nursing mothers (Deloian *et al.*, 2015; Shana *et al.*, 2023). Married students, especially those with young children, find it difficult to participate in online learning without adequate childcare options. The lack of on-campus childcare facilities limits the ability of students to focus on their studies while managing their parental responsibilities. Educational institutions should consider implementing support systems, such as affordable childcare services, to help married students, particularly mothers, balance their academic and family duties more effectively.

The result from the regression analysis showed that access to devices emerged as a significant factor, with a strong statistical association to academic performance (Obi *et al.*, 2025). This suggests that students who do not have reliable access to the necessary technology are at a distinct disadvantage in online learning environments. Similarly, the skill level of students in using digital tools and platforms also significantly impacts their ability to engage with online learning. It was found that students with higher skill levels in using digital technology experienced fewer difficulties, suggesting that more targeted technological training is essential to improve the learning experience for nursing mothers. Senyuva (2016) agreed with this finding by stating that students will repeat any teaching activity that is of value to them, which can increase their learning outcome in the long run. Similarly, the amount of time students dedicate to online learning was another important factor in their academic performance. Students who spend more time engaging with course materials tend to have better learning outcomes.

Conclusion

It was concluded from the findings of the study that online e-based learning is significant to the academic performance of nursing mothers. Online learning creates room for personalized learning, creates





access to academic materials, provides a platform to network with other experts, provides real time solution to learning problems, and provides a platform for self-assessment, thereby increasing the chances of improved academic performance of this category of students.

However, the effectiveness of this innovation depends on critical factors such as access to relevant technological tools, the level of learners' skill, the amount of time dedicated to online-based learning, and other personal attributes of the learner. The problem of time management due to childcare activities, inadequate online infrastructure, the capital-intensive nature of online learning, inadequate technological skills, and the absence of childcare resources around the school must be addressed for optimal outcomes. Therefore, while online learning enhances academic performance, its full benefits can only be realized when institutions take into consideration the specific circumstances of nursing mothers and provide adequate technological, infrastructural, and childcare support systems.

Knowledge Contributions

The following contributions to knowledge proceeded from the findings of the study: (1) Participating in online classes is a significant tool that can enable nursing mothers to improve their academic performance, and the skillfulness to use online devices plays a major role in this regard. (2) Nursing mothers, whether married or single, perceive that there is similarity in the benefits and challenges that they face in the use of online classes for improving their academic performance.

Recommendations

The recommendations emanated from the findings of the study:

Universities need to reform the teaching and learning process to be fully hybrid in this era of technological innovations, and this is essential to enable students who cannot be physically present in the classroom at all times to participate in classroom activities, as this is essential for enhancing their classroom participation and, by implication, academic performance.

Partnership for the provision of subsidized digital tools needs to be encouraged between public Universities and technological firms, as this is relevant to bridge the digital divide between those who have access to these technologies and those who do not in these Universities for proper implementation of the virtual mode of teaching and learning.

In order to sharpen the digital skills of students, there is a need for University core and co-curricular activities to give adequate attention to training students on digital skills, which they can adopt in their learning process within and outside the University.

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