Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.17, No.3, 2026

Determinants of Teachers' Intention to Adopt the Flipped Classroom in Higher Education: The Role of Digital Anxiety and Perceived Institutional Support

Dr Makumbu Nsaka Martin,
National Pedagogical University (UPN), Democratic Republic of Congo
1A, av Malila, Q/Fikin, C/Limete
E-mail: martin.makumbu @outlook.fr

This research was financially supported by the Permanent Commission for Studies, Democratic Republic of Congo."

Abstract

As higher education systems expand and pursue learner-centered reform, understanding the conditions that support teachers' adoption of pedagogical innovation has become a strategic priority. In this context, the flipped classroom is increasingly promoted as a key pedagogical innovation in higher education, particularly within reforms advocating student-centered learning and the integration of digital technologies. Despite its documented pedagogical benefits, its adoption by university teachers remains uneven, especially in contexts undergoing systemic transformation. This study examines the determinants of teachers' intention to adopt the flipped classroom, focusing on the role of digital anxiety, perceived institutional support, and attitude toward this pedagogical approach. A quantitative survey was conducted among higher education teachers in the Democratic Republic of Congo (N = 294). Data were analyzed using descriptive statistics, exploratory factor analysis, reliability analysis, correlation analysis, multiple regression, and mediation testing. The results indicate that teachers report very positive attitudes toward the flipped classroom and a relatively high intention to adopt it within six months. However, digital anxiety negatively affects attitude, while perceived institutional support positively influences attitude. Attitude toward the flipped classroom emerges as the strongest predictor of adoption intention and fully mediates the effects of both digital anxiety and institutional support. These findings highlight the importance of addressing affective and institutional conditions to foster sustainable pedagogical innovation in higher education, particularly in reform-oriented contexts.

Keywords: flipped classroom; digital anxiety; institutional support; attitude; higher education; pedagogical innovation.

DOI: 10.7176/JEP/17-3-04
Publication date: March 28th 2026

1. Introduction

Over the past two decades, higher education systems worldwide have experienced profound transformations driven by the massification of access, diversification of student populations, and rapid expansion of digital technologies in teaching and learning (Bond et al., 2021; Czerniewicz et al., 2020; Howard & Tondeur, 2021; Kimmons et al., 2021). These changes have challenged traditional lecture-based instructional models and prompted institutions to seek pedagogical approaches that promote active learning, student engagement, and the development of higher-order competencies. Within this context, the flipped classroom has emerged as a widely discussed pedagogical model aligned with learner-centered and technology-supported education.

The flipped classroom is based on a reorganization of instructional time: introductory content is accessed by students before class, often through digital resources, while face-to-face sessions are dedicated to active learning activities such as problem solving, discussion, collaboration, and formative assessment. Numerous studies have highlighted the potential benefits of this approach in higher education, including increased student engagement, improved learning outcomes, and enhanced interaction between teachers and students. As a result, the flipped classroom is frequently presented as a pedagogical lever capable of supporting contemporary educational reforms.

Despite this growing interest, the actual adoption of the flipped classroom by university teachers remains uneven. Research on educational change consistently shows that the diffusion of pedagogical innovations depends not

only on their pedagogical effectiveness, but also on how they are perceived, supported, and appropriated by teachers. Innovations that are promoted at policy or institutional levels may remain marginal in practice if teachers experience uncertainty, lack of support, or psychological barriers to adoption.

This issue is particularly salient in African higher education contexts, and notably in the Democratic Republic of Congo (DRC). Congolese higher education institutions are engaged in the progressive implementation of the Bachelor–Master–Doctorate (BMD/LMD) system, which emphasizes competency-based curricula, student-centered pedagogies, and the integration of digital technologies. While these reforms provide a favorable policy framework for pedagogical innovation, their implementation faces significant challenges related to infrastructure, professional development, and institutional support. Consequently, innovations such as the flipped classroom are often recognized in principle but remain inconsistently implemented.

Understanding teachers' intention to adopt the flipped classroom therefore requires moving beyond purely technical or infrastructural explanations. Psychological and organizational factors play a central role in shaping teachers' engagement with pedagogical innovation. Among these factors, digital anxiety and perceived institutional support have been identified as particularly influential. Digital anxiety refers to feelings of apprehension, fear, or discomfort associated with the use of digital technologies, while perceived institutional support reflects teachers' perceptions of the extent to which their institution provides training, mentoring, resources, and recognition for pedagogical innovation.

Technology acceptance theories offer a useful analytical lens for examining these processes. In particular, attitude toward an innovation is widely recognized as a key determinant of behavioral intention. However, in educational contexts undergoing reform, attitudes are shaped by both affective factors (such as anxiety) and contextual conditions (such as institutional support). Yet few empirical studies have examined these relationships simultaneously in African higher education settings.

Against this backdrop, the present study aims to analyze the determinants of higher education teachers' intention to adopt the flipped classroom in the DRC, focusing on digital anxiety, perceived institutional support, and attitude toward the flipped classroom. Specifically, the study addresses the following research questions:

- What are teachers' attitudes toward the flipped classroom and their intention to adopt it?
- How does digital anxiety influence attitude and intention to adopt the flipped classroom?
- How does perceived institutional support influence attitude and intention?
- Does attitude mediate the relationships between digital anxiety, institutional support, and adoption intention?

By addressing these questions, this study contributes empirical evidence from an under-researched context and provides insights into the affective and institutional conditions necessary for sustainable pedagogical innovation in higher education.

2. Literature Review

2.1. The Flipped Classroom in Higher Education

The flipped classroom is rooted in constructivist and active learning traditions that emphasize student engagement and the active construction of knowledge. Popularized by Bergmann and Sams, the approach reorganizes instructional sequences so that direct instruction occurs outside the classroom, while in-class time is devoted to interactive and cognitively demanding activities. In higher education, this model is often associated with problem-based learning, collaborative work, and formative assessment.

Empirical research has reported mixed but generally positive outcomes associated with the flipped classroom. Studies indicate improvements in student engagement, motivation, and, in some cases, academic performance. However, systematic reviews emphasize that these benefits are not automatic and depend heavily on implementation quality, instructional design, and alignment with assessment practices. The flipped classroom therefore represents not merely a technological innovation, but a pedagogical transformation requiring careful planning and sustained effort from teachers. Recent evidence also continues to document positive flipped-classroom outcomes in specific domains; for example, Li et al. (2026) reported improved performance, situational interest, and attitudes in a mobile flipped-classroom physical education intervention, underscoring the importance of implementation design.

From the teacher's perspective, adopting the flipped classroom entails significant changes in instructional practices, including the production or selection of digital resources, redesign of classroom activities, and management of student participation. These demands can generate uncertainty and resistance, particularly in

contexts where institutional support is limited. As a result, understanding teachers' adoption of the flipped classroom requires attention to both individual and contextual factors.

2.2. Technology Acceptance and Pedagogical Innovation

Models of technology acceptance, particularly the Technology Acceptance Model (TAM), have been widely used to explain individuals' intention to use new technologies. According to TAM, perceived usefulness and perceived ease of use influence attitude toward a technology, which in turn shapes behavioral intention. Extensions of this model, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), incorporate social influence and facilitating conditions.

Applied to educational settings, these models have provided valuable insights into teachers' adoption of digital tools. However, several scholars argue that technology acceptance models must be adapted to account for the specificities of teaching, including professional beliefs, pedagogical identity, and emotional dimensions. In this regard, attitude toward pedagogical innovation emerges as a central construct that integrates cognitive evaluations, emotional responses, and contextual considerations.

2.3. Digital Anxiety and Pedagogical Adoption

Digital anxiety refers to feelings of fear, apprehension, or discomfort related to the use of digital technologies. It is closely linked to self-efficacy beliefs and can persist even among individuals with adequate technical skills. In educational contexts, digital anxiety has been identified as a significant barrier to technology integration, leading teachers to avoid experimentation or rely on traditional practices.

In the case of the flipped classroom, digital anxiety may be intensified by the visibility of digital content, fear of technical failure during instruction, and concerns about managing hybrid learning environments. Even when teachers recognize the pedagogical value of the flipped classroom, anxiety can undermine their willingness to adopt it, particularly in the absence of supportive conditions.

2.4. Perceived Institutional Support

Perceived institutional support refers to teachers' perceptions of the extent to which their institution provides resources, training, mentoring, time, and recognition to support pedagogical innovation. Research consistently shows that institutional support plays a crucial role in facilitating teachers' engagement with new pedagogical practices. Supportive environments enhance teachers' confidence, reduce perceived risk, and foster positive attitudes toward innovation.

In higher education systems undergoing reform, perceived institutional support is especially important. Teachers often face multiple demands related to curriculum change, assessment reform, and administrative requirements. Without adequate support, pedagogical innovations may be adopted superficially or abandoned altogether.

2.5. Conceptual Framework and Hypotheses

Drawing on the literature, this study proposes a conceptual framework in which digital anxiety and perceived institutional support influence teachers' intention to adopt the flipped classroom, both directly and indirectly through attitude toward the flipped classroom. The following hypotheses were formulated:

- H1: Digital anxiety is negatively associated with attitude toward the flipped classroom.
- H2: Perceived institutional support is positively associated with attitude toward the flipped classroom.
- H3: Attitude toward the flipped classroom is positively associated with intention to adopt it.
- H4: Attitude mediates the relationship between digital anxiety and adoption intention.
- H5: Attitude mediates the relationship between perceived institutional support and adoption intention.

3. Methodology

3.1. Research Design

A quantitative explanatory research design was adopted to examine the relationships between digital anxiety, perceived institutional support, attitude toward the flipped classroom, and adoption intention. A cross-sectional survey was used to collect data from higher education teachers.

3.2. Context and Participants

The study was conducted in higher education institutions in the Democratic Republic of Congo, within the context of ongoing BMD/LMD reforms promoting active learning and digital integration. A total of N = 294 questionnaires were collected from university teachers across various disciplines and institutions.

After data cleaning, the number of valid cases varied slightly depending on the analysis. Descriptive statistics were computed on approximately 287–290 responses, while regression and mediation analyses were conducted on N = 284 complete cases.

3.3. Instrument

Data were collected using a structured questionnaire comprising 17 items measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The instrument measured four constructs: perceived institutional support (2 items), digital anxiety (8 items), attitude toward the flipped classroom (4 items), and adoption intention within six months (3 items).

3.4. Data Analysis

Data were analyzed using standard statistical procedures, including descriptive statistics, exploratory factor analysis, reliability analysis (Cronbach's alpha), Pearson correlation analysis, multiple regression, and mediation testing using bootstrapped confidence intervals. Statistical significance was set at $p < .05$.

4. Results

4.1. Descriptive Statistics

Composite scores were computed as the mean of items within each construct (5-point Likert scale; 1 = strongly disagree; 5 = strongly agree). The descriptive results show a very favorable disposition toward the flipped classroom (Attitude), a moderately high short-term intention to adopt, moderate perceived support, and moderate-to-low digital anxiety.

Table 1. Descriptive statistics (composite scores)

Construct	Items (k)	N (valid)	Mean (M)	SD
Perceived Institutional Support	2	289	3.17	1.18
Digital Anxiety	8	290	2.29	0.78
Attitude toward the Flipped Classroom	4	290	4.23	0.61
Adoption Intention (6 months)	3	287	3.75	1.10

(Items and construct definitions correspond to the 17-item instrument organized into four dimensions: support, anxiety, attitude, intention.)

Titre provisoire de l'article

4.2. Exploratory Factor Analysis (EFA)

EFA was conducted to assess the underlying structure of the 17 items. Sampling adequacy was satisfactory, with a KMO = 0.774, and Bartlett's test of sphericity was significant ($\chi^2(136) = 2029.36$, $p < .001$), indicating that the correlation matrix was factorable.

A four-factor solution was retained and aligned with the theoretical framework: Intention, Digital Anxiety, Institutional Support, and Attitude. The strongest loadings were observed for Intention and Anxiety items; Support items loaded clearly on their factor; Attitude items also loaded coherently (factor sign is arbitrary).

Table 2. EFA summary (4 factors, rotated solution)

- Factor 1: **Intention** (3 items; high absolute loadings ≈ .86–.95)
- Factor 2: **Digital Anxiety** (8 items; strongest loadings ≈ .48–.78; the "apprehension" item loads weaker)
- Factor 3: **Institutional Support** (2 items; loadings ≈ .81–.84)
- Factor 4: **Attitude** (4 items; loadings ≈ .43–.66)

(Instrument item wording and ordering are provided in the dataset header and in the manuscript method section.)

pasted

4.3. Reliability of the Scales

Internal consistency was assessed using Cronbach's alpha. All scales met or exceeded the commonly accepted

threshold of .70, indicating satisfactory reliability.

Table 3. Reliability (Cronbach's α)

Construct	k	Cronbach's α
Perceived Institutional Support	2	0.818
Digital Anxiety	8	0.801
Attitude	4	0.705
Adoption Intention	3	0.936

4.4. Correlations among Variables

Pearson correlations between composite scores indicate that perceived institutional support is positively associated with attitude, while digital anxiety is negatively associated with attitude. Attitude is positively correlated with adoption intention.

Table 4. Correlation matrix (Pearson r)

Support	1			
Anxiety	-0.033	1		
Attitude	0.282*	-0.204*	1	
Intention	0.088	0.039	0.279*	1
* p < .05, * p < .01, *** p < .001				

Key pairwise results (with valid N): Support–Attitude (N=288, r=0.282, p<.001), Anxiety–Attitude (N=289, r=-0.204, p<.001), Attitude–Intention (N=286, r=0.279, p<.001).

4.5. Multiple Regression Predicting Adoption Intention

A multiple regression model was estimated with adoption intention as the dependent variable and support, anxiety, and attitude as predictors (N = 284 complete cases on composites). The model was statistically significant and explained a modest but meaningful proportion of variance in intention ($R^2 = 0.085$, $F(3,280) = 8.657$, $p < .001$).

Table 5. Regression results (DV = Intention; standardized β)

Predictor	β	t	p
Support	0.007	0.110	.912
Anxiety	0.098	1.677	.095
Attitude	0.293	4.836	< .001

Attitude emerged as the only significant predictor of intention in the presence of the other variables.

4.6. Mediation Tests: The Role of Attitude

Mediation analyses tested whether attitude mediates the effects of (a) support and (b) anxiety on adoption intention (bootstrapped confidence intervals; covariate included).

4.6.1. Support → Attitude → Intention

The indirect effect of support on intention through attitude was positive and statistically significant: indirect effect = 0.077, 95% CI [0.035; 0.131]. The direct effect of support on intention (c') was not significant (β = 0.007).

4.6.2. Anxiety → Attitude → Intention

The indirect effect of anxiety on intention through attitude was negative and statistically significant: indirect effect = -0.057, 95% CI [-0.102; -0.019]. The direct effect (c') was not significant at .05 (β = 0.098, p = .095), suggesting that anxiety primarily operates by lowering attitude rather than directly suppressing intention.

Table 6. Mediation summary (standardized; N = 284)

Model	a (X→Attitude)	b (Attitude→Intention)	Indirect a×b	95% CI	c' (direct)
Support → Attitude → Intention	0.263	0.293	0.077	[0.035; 0.131]	0.007
Anxiety → Attitude → Intention	-0.195	0.293	-0.057	[-0.102; -0.019]	0.098

5. Discussion

This study examined determinants of higher education teachers' intention to adopt the flipped classroom, focusing on perceived institutional support, digital anxiety, and attitude toward the flipped classroom. The findings provide a coherent pattern: teachers express a very positive attitude (M = 4.23/5) and a relatively high short-term intention to adopt (M = 3.75/5), while reporting moderate perceived support (M = 3.17/5) and moderate-to-low anxiety (M = 2.29/5).

5.1. Attitude as the central driver of adoption intention

The regression results show that attitude is the strongest and only statistically significant predictor of adoption intention ($\beta = 0.293$, $p < .001$). This supports acceptance models emphasizing the role of attitudinal evaluations in shaping behavioral intentions. Practically, even in contexts where support is imperfect and anxiety exists, teachers who perceive the flipped classroom as pedagogically valuable and enjoyable are more likely to intend adoption within six months.

5.2. Support and anxiety operate mainly through attitude (mediation)

Although perceived support is positively correlated with attitude ($r = 0.282$, $p < .001$), its direct effect on intention is not significant when attitude is included. Mediation confirms that support influences intention primarily indirectly through attitude (indirect = 0.077; CI excludes 0). This suggests that institutional/mentoring support matters insofar as it shapes teachers' evaluative stance (confidence, perceived feasibility, and perceived pedagogical value).

Digital anxiety is negatively correlated with attitude ($r = -0.204$, $p < .001$) and shows a significant negative indirect effect on intention through attitude (indirect = -0.057; CI excludes 0). Importantly, in this dataset anxiety does not show a significant negative direct relationship with intention once attitude is modeled. This implies that anxiety may not immediately "kill" intention, but it erodes the attitudinal conditions that foster intention—highlighting the importance of interventions that reduce anxiety by building psychological safety and mastery experiences.

5.3. Implications for higher education institutions (DRC context)

Given these findings, institutional strategies should target attitude formation and stabilization by:

1. Structuring mentoring and training as a lever to strengthen positive attitudes (since support works through attitude).
2. Reducing anxiety via guided practice (micro-design workshops, step-by-step production of pre-class resources, peer rehearsal, troubleshooting routines).
3. Creating low-risk implementation pathways, e.g., "one flipped session per month" before full redesign, to preserve high attitude while preventing anxiety spikes.

5.4. Limitations and future work

The study relies on self-reported data and convenience sampling, which limits generalizability. Missing data reduced the number of complete cases for some analyses. Future studies could include longitudinal designs to observe how attitude and anxiety evolve during actual implementation and could test expanded models that incorporate perceived usefulness/ease of use and social influence (available in your larger dataset).

6. Conclusion

This study examined the determinants of higher education teachers' intention to adopt the flipped classroom in the Democratic Republic of Congo. The results demonstrate that attitude toward the flipped classroom is the strongest predictor of adoption intention and mediates the effects of both digital anxiety and perceived institutional support.

The findings highlight the need for higher education institutions to address affective and organizational

conditions when promoting pedagogical innovation. By investing in sustained support mechanisms and anxiety-reducing strategies, institutions can create environments conducive to meaningful and durable pedagogical change. Future research should examine these relationships using longitudinal and multi-site designs, and should test expanded models that incorporate perceived usefulness, social influence, and observed implementation behaviors. Comparative studies across African higher education institutions would also help clarify how contextual constraints and support systems shape the transition from intention to sustained pedagogical adoption.

6. References

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2021). Emergency remote teaching in higher education: Mapping the first global online semester. International Journal of Educational Technology in Higher Education, 18(1), 50. https://doi.org/10.1186/s41239-021-00282-x

Cabi, E. (2023). Effects of flipped classroom model on students' academic achievement and attitudes: A meta-analysis. Education and Information Technologies, 28, 2117–2143. https://doi.org/10.1007/s10639-022-11286-3

Chen, Y., Wang, Y., & Chen, N. S. (2021). Is flipped learning effective in higher education? A meta-analysis of empirical studies. Educational Technology & Society, 24(4), 1–15.

Czerniewicz, L., Agherdien, N., Badenhorst, J., et al. (2020). A wake-up call: Equity, inequality and COVID-19 emergency remote teaching. Postdigital Science and Education, 2, 946–967. https://doi.org/10.1007/s42438-020-00187-4

Hew, K. F., Bai, S., Huang, W., Dawson, P., & Du, J. (2020). On the use of flipped classroom across disciplines: A meta-analysis. Educational Research Review, 30, 100314. https://doi.org/10.1016/j.edurev.2020.100314

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. Educause Review. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Howard, S. K., & Tondeur, J. (2021). Teachers' technology integration practices: Insights from post-pandemic education. Computers & Education, 168, 104212. https://doi.org/10.1016/j.compedu.2021.104212

Kimmons, R., Rosenberg, J. M., & Allman, B. (2021). Trends in educational technology adoption: Evidence from the COVID-19 shift. Educational Technology Research and Development, 69, 1745–1768. https://doi.org/10.1007/s11423-021-09986-1

La Torre, G., De Leonardis, V., & Chiappetta, M. (2020). Technostress: How does it affect the productivity and life of an individual? International Journal of Environmental Research and Public Health, 17(21), 7833. https://doi.org/10.3390/ijerph17217833

Salanova, M., Llorens, S., & Cifre, E. (2020). Technostress and digital well-being in higher education teachers. Current Psychology, 39, 2041–2054. https://doi.org/10.1007/s12144-020-00899-0

Scherer, R., Teo, T., & Tondeur, J. (2020). Profiling teachers' readiness for online teaching and learning. Computers in Human Behavior, 118, 106675. https://doi.org/10.1016/j.chb.2020.106675

Teo, T., Fan, A. C. W., & Du, J. (2022). Technology acceptance among university teachers: A systematic review of post-pandemic studies. Educational Technology Research and Development, 70, 2673–2698. https://doi.org/10.1007/s11423-022-10128-7

Trust, T., Whalen, J., & Greenhow, C. (2020). Teaching during a pandemic: Teachers' experiences and support needs. Educational Technology Research and Development, 68, 3659–3675. https://doi.org/10.1007/s11423-020-09862-2

Wang, Y., Han, X., & Yang, J. (2021). Revisiting the intention to use flipped classrooms: A technology acceptance perspective. Education and Information Technologies, 26, 5905–5924. https://doi.org/10.1007/s10639-021-10516-0

Zhang, Y., Wang, T., & Lin, H. (2022). Teachers' adoption of flipped classrooms: The role of institutional support and technostress. Computers & Education, 181, 104461. https://doi.org/10.1016/j.compedu.2022.104461

Li, L., Chen, M., Liu, W., & Luo, Y. (2026). Promoting students' performance, situational interest and

attitude towards physical activity: An UARC based mobile flipped classroom teaching mode. Current Psychology, 45(3), 208. https://doi.org/10.1007/s12144-025-08619-9