

Pedagogy in a State College During Educational Disruption: A Strategic Framework for Sustainable Teacher Development

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ABSTRACT This study evaluated the implementation of flexible pedagogy in a state college and developed a Sustainable Teacher Development Program (STDP) to strengthen instructional adaptability and long-term faculty growth. Descriptive multi-methods design was used, data were gathered from faculty who implemented flexible teaching between 2020 and 2022 through a validated survey measuring pedagogical practices and a qualitative component based on SWOT analysis. Results revealed strong institutional and instructional capacities, including effective technology integration, diverse learning resources, and robust academic support. However, weaknesses such as limited learner autonomy, inconsistent differentiated instruction, and gaps in ICT and psychosocial support persist. Opportunities in professional development, resource-sharing platforms, and technological innovations are present while threats-connectivity issues, workload pressures, infrastructure limitations, and resistance to change, which pose ongoing challenges. Through the TOWS matrix, strategic orientations were formulated and integrated into the STDP S-Framework (Stability, Skill-Building, Systems, Support, Sustainability), which sustains flexible pedagogy of teachers.

INTRODUCTION

The COVID-19 pandemic triggered an unprecedented global disruption in education, compelling higher education institutions to rapidly modify instructional delivery to maintain academic continuity (UNESCO 2020; Crawford et al. 2020). Flexible pedagogy, characterised by adaptable learning modalities such as online, modular, blended, and technology-enhanced instruction, emerged as a key approach for sustaining educational quality during this shift (Ryan 2013; Bozkurt 2020). In the Philippines, the adoption of flexible learning aligns not only with emergency responses but also with long-term national and global commitments to inclusive, equitable, and lifelong learning as articulated in Sustainable Development Goal (SDG) 4 (United Nations 2015). By modifying the dimensions of time, location, pace and mode of learning, flexible pedagogy seeks to broaden access, promote learner autonomy, and respond to the varied needs of diverse student populations.

Despite its growing global prominence, the implementation of flexible pedagogy in developing regions such as Central Bicol remains fraught with systemic challenges. State colleges in these areas contend with limited infrastructure, uneven digital literacy, resource constraints, and heterogeneous student readiness. Teachers, central agents in ad-

vancing SDG 4, play a pivotal role in navigating these constraints, yet the long-term effects of flexible pedagogy on teacher development, professional resilience, and instructional sustainability remain underexplored. This gap signals the need for localised studies that examine the institutional realities and contextual barriers shaping the adoption and sustainability of flexible learning in Philippine state colleges.

Recent empirical studies illuminate both the potential and the persistent limitations of flexible learning in the Philippine context. In a phenomenological study among students of Camarines Sur Polytechnic Colleges, Pontillas (2025) found that despite technological constraints and pronounced digital divide issues, learners demonstrated marked resilience, proactive learning orientations, and strategic coping mechanisms during prolonged digital instruction. The study further emphasised the importance of social interaction, virtual community building, and multilingual approaches in promoting inclusivity and cultural relevance in resource-constrained, multilingual settings (Pontillas 2025). Evidence generally shows positive student perceptions of flexible learning modalities, particularly in teaching methods and learning resources, although concerns persist regarding assessment practices and support services (Bercasio and Dugan 2025). Hybrid models appear most preferred, indicating the

importance of balancing online and face-to-face interactions (Patalinghug and Patalinghug 2024). However, readiness remains uneven, with significant variations across student groups and institutions (Licayan et al. 2021). From the faculty perspective, studies in the Philippines and Southeast Asia highlight the emergence of “pedagogical resilience”, as teachers adapt their practices despite limited digital training and resources (Zara et al. 2022). These findings underscore the importance of sustained, well-supported professional development to ensure that such resilience translates into long-term instructional innovation rather than short-lived crisis responses.

The literature further converges on the view that sustainable flexible pedagogy requires not only sound instructional design but also systemic infrastructure and robust institutional support. Effective flexible learning environments depend on reliable ICT systems, low-bandwidth materials, centralised repositories, and responsive technical support structures (Koh 2023; Majid et al. 2025). Equally essential are psychosocial supports and workload policies that mitigate burnout and strengthen teacher resilience (Zara et al. 2022). Teacher professional development (TPD) must also extend beyond one-off workshops toward continuous, contextualised learning supported by mentoring, professional learning communities, and collaborative knowledge-building (Huang 2024). These interrelated components point to the need for integrated, institutionally grounded strategies that align pedagogy, capacity-building, and systemic support.

Building on these insights, international scholarship increasingly frames flexible pedagogy as a long-term transformation of higher education rather than a temporary emergency measure. Studies emphasise that sustainability in flexible learning hinges on institutional coherence, teacher agency, and equity-oriented design. Rapanta et al. (2020) argue that effective flexible pedagogy requires pedagogical coherence across curriculum, assessment and digital tools, cautioning that poorly aligned practices can exacerbate inequities and cognitive overload. Similarly, Bond et al. (2020) demonstrate that technology-enhanced flexible learning environments yield positive outcomes only when supported by inclusive design principles and active pedagogical scaffolding. From a teacher development perspective, Trust et al. (2020) highlight how professional learning networks and collaborative digital communities strengthen teachers’ adaptive expertise and

capacity for sustained innovation. Empirical evidence from large-scale studies further shows that students’ engagement and persistence in flexible learning are strongly mediated by institutional support structures and instructors’ pedagogical preparedness rather than technology alone (Means and Neisler 2021). In the context of teacher education, Flores and Gago (2020) underscore that post-pandemic pedagogical change is deeply shaped by teachers’ professional identities and working conditions, reinforcing the need for systemic support to translate crisis-driven adaptability into enduring pedagogical resilience. Collectively, these studies reinforce the argument that sustainable flexible pedagogy, particularly in resource-constrained contexts, must be grounded in institutional investment, continuous teacher professional development, and equity-driven policy frameworks aligned with global education goals.

Translating these insights into coherent policy and programmatic action requires structured analytical tools that can link internal institutional capacities to external opportunities and challenges. Strategic frameworks, such as SWOT and Weihrich’s TOWS matrix (1982), enable institutions to identify their strengths, weaknesses, opportunities and threats, and convert these findings into responsive strategies. Guided by this analytical foundation, the Sustainable Teacher Development Program (S-Framework) proposes a holistic approach that integrates pedagogical design, continuous teacher development, institutional support systems, and policy alignment. This study, therefore, examines the status of flexible pedagogy in a state college in Central Bicol and develops a strategic, evidence-based framework to advance sustainable teacher development, contributing to long-term instructional adaptability, institutional resilience, and the realisation of SDG 4 within resource-constrained contexts.

Objectives of the Study

The current undertaking aims to evaluate the implementation of flexible pedagogy and develop a sustainable framework for teacher development that strengthens instructional adaptability, addresses systemic challenges, and promotes long-term professional growth and innovation in teaching.

The study is guided by the following objectives:

1. To assess the internal strengths and weaknesses as well as the external opportunities

and threats of flexible pedagogy implementation, focusing on teaching adaptability, differentiated instruction, technology integration, institutional support, learner autonomy, ICT gaps, professional development, and contextual challenges such as connectivity and resistance to change.

2. To formulate strategic orientations for sustainable teacher development by applying the TOWS matrix to align strengths and weaknesses with opportunities and threats in flexible pedagogy implementation.
3. To develop a Sustainable Teacher Development Program (STDP) framework anchored on the five interrelated components of Stability, Skill-Building, Systems, Support, and Sustainability (S-Framework), that will ensure long-term instructional adaptability and teacher growth.
4. To propose education strategies and policies that educational institutions may adopt to sustain flexible pedagogy and enhance teacher resilience, professional competence, and learner-centred practices during and beyond periods of educational disruption.

MATERIAL AND METHODS

This study adopts a descriptive research design utilising a multi-methods approach to comprehensively assess the status of flexible pedagogy in a state college in Central Bicol. The methodology was intentionally structured to respond to gaps identified in earlier research, particularly the need for both quantitative evaluation of pedagogical practices and qualitative insight into teachers' lived experiences. Through this combination, the study captures the multidimensional nature of flexible pedagogy, its instructional, structural, and institutional components, while ensuring that findings meaningfully inform a sustainable development framework for faculty.

The descriptive design guides the systematic collection and analysis of data without manipulating variables, making it appropriate for examining real-world teaching adaptations implemented during the COVID-19 pandemic (Creswell and Creswell 2018). The respondents of the study consisted of faculty members from Camarines Sur Polytechnic Colleges (CSPC) who applied flexible pedagogical strategies during the COVID-19 pandemic from 2020

to 2022. Specifically, the study population included all full-time and part-time faculty members who implemented flexible teaching modalities during academic years 2020–2021 to 2021–2022. Purposive sampling was employed to the selected faculty members who had taught at least one full semester under online, modular, or blended learning and had been employed at CSPC before March 2020. Invitations were sent to 82 eligible faculty members, with 67 completing the survey (81.7% response rate), exceeding the minimum target of 50 respondents based on descriptive survey guidelines (Memon et al. 2020). Their direct involvement in adapting instruction under crisis conditions positions them as the most reliable sources of information regarding the strengths and gaps of flexible learning within the institution.

To capture both breadth and depth of data, the study employed a structured survey composed of three major sections for demographic profiles, ratings of flexible pedagogy across key dimensions, and a SWOT-based qualitative component. The instrument was developed from established literature on flexible pedagogy (Ryan and Tilbury 2013; UNESCO 2020), validated by experts in education, and pilot-tested with non-participating teachers to ensure clarity and reliability. The resulting Cronbach's alpha coefficient of 0.91 indicates strong internal consistency, supporting the survey's suitability for measuring perceptions and experiences (Tavakol and Dennick 2011).

Data collection followed rigorous procedures to ensure ethical and methodological integrity throughout the study. Institutional approval and ethics clearance were secured prior to implementation, and informed consent procedures were observed during the data-gathering period from March to May 2022. A validated survey questionnaire was converted into a Google Form and distributed through official email and Messenger groups by department chairs, with reminders sent during the second and fourth weeks; both electronic and printed formats were utilized to accommodate respondents with varying levels of internet access and to promote inclusivity. After retrieval, quantitative responses were coded and prepared for statistical analysis, while qualitative entries from the SWOT component were transcribed and organized for thematic analysis.

For data analysis, descriptive statistics, including frequencies, percentages, means, and standard

deviations, were used to determine the status of flexible pedagogy across identified dimensions. Responses were interpreted using a five-point Likert scale anchored in established interpretive ranges (Joshi et al. 2015). Meanwhile, qualitative responses were subjected to thematic categorisation, enabling the identification of recurring strengths, weaknesses, opportunities, and threats. These integrated analyses provide a nuanced understanding of flexible pedagogy as implemented within the institution, serving as the foundation for the development of the Sustainable Teacher Development Program (S-Framework).

RESULTS AND DISCUSSION

The quantitative results reflected in the Table 1 indicated a paradoxical profile of the flexible pedagogy implementation at Camarines Sur Polytechnic College. Classroom delivery modes are generally highly flexible with faculty showing a high level of adaptation with the most commonly used being the asynchronous (60%) and blended synchronous asynchronous (57%) approaches; however, very few faculty show learner centered approaches. Learners' autonomy is limited, as only 44.9 percent are given choice of learning tasks and only 25.3 percent are given choice of assessment tasks, suggesting that the system is teacher directed, which restricts choice by the learners (Deci and Ryan 2000). When differentiated instruction is reported (61.1%), there is a lack of variation ($SD = 0.49$) indicating that differentiated instruction is not really being implemented. Strong teaching presence is evident in adherence with structured schedules ($M = 4.42$, 80.4%), and high synchronous engagement, but this is compromised by infrastructural volatility (39.9% of faculty report changing schedules because of power or connection issues). Overall, adaptability seems more of an operational than a pedagogical issue, driven by the constraints and restrictions of the environment and the flexibility of assessment.

What is revealed on the surface is a set of grave structural dangers and nascent, but insufficiently developed, opportunities. Faculty experience critical deficiency in ICT related support ($M = 2.23$), where essential supplies like tablets ($M = 1.63$), load allowances ($M = 1.63$) and routers ($M = 2.30$) are seldom provided and faculty have to depend heavily on their own gadgets like laptops ($M = 4.78$) and mobile phones ($M = 3.87$). Similarly, financial and

administrative support is weak ($M = 2.55$) and communication allowances are de facto non-existent ($M = 1.76$), reflecting a systemic externalization of teaching costs to teachers. Notwithstanding, there are opportunities for the use of ubiquitous digital tools, especially those based on Google, that are ubiquitous and have high scores for both synchronous instruction ($M = 4.81$) and for asynchronous instruction ($M = 4.41$). Informal peer collaboration ($M = 3.24$) also indicates a pre-existing but not formalized professional learning network in which sharing of resources including presentations ($M = 3.77$) and videos ($M = 3.53$) may be institutionalized into more sustainable support structures, if supported in a suitable way.

The results also reveal an important mismatch between the professional development and its pedagogical outcomes. While most of the training interventions, including webinars ($M = 4.38$) and workshops ($M = 4.35$), are consistently offered, they focus more on technical aspects of delivery than on transformative approaches to learner assessment. This is one reason why learner autonomy in assessment design has not been achieved and why there is a continued reliance on synchronous heavy instruction, even further exacerbated by unstable infrastructure and lack of compensation for costs of the ICTs. An understanding of resistance to flexible assessment practices is therefore more contextual than cultural, in part because of cultural, systemic, and model factors, such as unreliable connectivity, limited institutional support, and poor models for low bandwidth differentiated instruction. As a whole, the evidence presents a SWOT analysis that is now in the form of a diagnosis based on structure. The institutions have significant strengths to adapt and use digital tools, but external threats are high, and opportunities to use accessible tools and learn from peers are not taken beyond their current capacity. Remediation of these gaps must be achieved by integrating reforms in the right balance of investment in ICT, re-designed assessment systems that are learner-centred, and pedagogical support that is ongoing, to be effective in the real context of infrastructure.

Assessment of Strengths, Weaknesses, Opportunities and Threats (SWOT) in Flexible Pedagogy Implementation

This section presents the key findings on sustaining flexible pedagogy, beginning with a SWOT

Table 1: Descriptive statistics of flexible pedagogy implementation by key dimension, with corresponding internal and external SWOT factors

<i>Online class dimensions</i>	<i>Frequency count (n / N)*</i>	<i>Standard Deviation</i>			<i>Alignment with SWOT element</i>
		<i>Mean (M)</i>	<i>(SD)</i>	<i>Interpretation</i>	
Differentiated instruction used	96 / 157 (61.1% Yes)	0.61	0.49	Moderate adoption	Weakness: Inconsistent implementation
Allowing learners to choose learning tasks	71 / 158 (44.9% Yes)	0.45	0.5	Low	Weakness: Low learner autonomy
Allowing learners to choose assessment tasks	40 / 158 (25.3% Yes)	0.25	0.44	Very low	Critical weakness (resistance to change)
Synchronous real-time teaching	—	4.42	0.68	Always	Strength: Strong teaching presence
Asynchronous self-regulated learning	—	3.76	0.81	Often	Strength: Adaptability
ICT-related support (overall)	—	2.23	0.68	Rarely	Threat: Severe ICT gap
Administrative and financial support (overall)	—	2.55	0.73	Rarely	Threat: No allowances, high out-of-pocket costs
Google tools for synchronous teaching	—	4.81	0.52	Always	Opportunity: Low-cost, accessible platform
Colleague-shared resources	—	3.24	0.31	Sometimes	Opportunity: Informal learning collaboration
Online training/webinars (academic support)	—	4.35–4.38	0.59–0.64	Always	Strength (delivery) but weakness (content not transformative)
Psycho-social support (expert counseling)	—	2.66–2.75	0.99–1.02	Rarely	Threat: Lack of structured mental health support
Adjustment of class timing due to interruptions	63 / 158 (39.9%)	0.4	0.49	High prevalence	Weakness/threat: Connectivity and power instability

Note: For binary variables (Yes/No), frequency count is presented as proportion where mean equals the proportion of “Yes”; for Likert-scale variables (1–5), mean and standard deviation (SD) are computed from raw scores, with “n” varying per item (157–165) due to partial responses from the total faculty sample of 67 (multiple responses per participant allowed across items), and SWOT alignment is derived from the author’s original qualitative SWOT themes (for example, unstable connectivity, resistance to change, lack of ICT funding, peer collaboration as opportunity).

assessment that integrates both qualitative reflections and quantitative descriptive data from faculty surveys. The quantitative findings empirically anchor each SWOT dimension: strengths such as high synchronous teaching presence ($M = 4.42$) and widespread use of Google platforms ($M = 4.81$) validate faculty adaptability and technology integration; weaknesses including severely limited learner autonomy in assessment choice (25.3%, $M = 0.25$) and inconsistent differentiated instruction (61.1%, $M = 0.61$) reveal persistent teacher-centered practices; opportunities such as accessible digital tools (availability $M = 4.75$, ease of use $M = 4.69$) and col-

league-shared resources ($M = 3.24$) point to low-cost pathways for improvement; and threats including rare ICT-related support ($M = 2.23$), absent financial allowances ($M = 1.76$), and schedule adjustments due to connectivity interruptions (39.9%) expose systemic infrastructure gaps. From this evidence-based SWOT assessment, the TOWS matrix generates strategic orientations for sustainable teacher development, which then inform the S-Frame-work for the Sustainable Teacher Development Program (STDP)—a holistic, evidence-based institutional process integrating stability, skill-building, systems, support, and sustainability to enhance

teachers' capacity to introduce and maintain flexible pedagogy amid changing educational conditions and disruptions.

Being a holistic initiative, the STDP goes beyond short-term professional development by institutionalizing continuous improvement, resilience, and innovation, enabling state colleges to sustain high-quality, flexible teaching practices over time. Finally, this section outlines actionable policies that reinforce institutional resilience, enhance faculty competence, and promote innovative teaching practices, all grounded in the empirical evaluation of flexible pedagogy that identifies principal organizational strengths, limitations, external possibilities, and challenges as a foundation for improving instructional adaptability and effectiveness.

Strengths of Flexible Pedagogy

The strengths identified in flexible pedagogy demonstrate the adaptability and resourcefulness of teachers and institutions in sustaining effective teaching-learning practices. Key strengths include the capacity for flexible learning locations, implementation of tailored instruction, utilisation of diverse educational materials, integration of technology, and consistent institutional academic support. All of these practices contribute to student engagement and access to education. These strengths are congruent with international trends in 21st century education, which suggest that flexibility and technology integration are characteristics of inclusivity and innovation (Dumford and Miller 2018). Varied instruction, as well as varied resources, ensure that the needs of various learners are considered, while teacher training and institutional options demonstrate the organisational commitment to teacher preparedness. Varied instruction and resources are essential for addressing the diverse needs of learners, while teacher training and institutional support reflect a commitment to educator preparedness. Differentiated Instruction (DI) allows educators to tailor their teaching strategies to accommodate individual student differences, enhancing engagement and learning outcomes. This approach is particularly effective in diverse classrooms, where students may vary in readiness, interests and abilities (Sapkota 2025; Blaz 2016). These strengths also demonstrate that institutions are positioned well to sustain a flexible pedagogy, through teacher engagement in innovation and support systems. Moreso, Tanveer

(2025) advocated for robust institutional investment and learner-centered strategies, which are essential for maximising student engagement and improving learning outcomes, thereby reinforcing the role of supportive systems in promoting innovative teaching methods. Sustaining and systematising these gains will allow faculty to remain effective across teaching contexts.

Also, there are evidences that proves and complicates the advantages of flexible pedagogy in higher education. Systematic reviews indicate that technology-based and flexible instructional strategies implemented during and after the COVID-19 pandemic increased accessibility and persistence of learning, although such advantages were found to be most extensive when structured pedagogical design and institutional frameworks addressed the need for flexibility of instructional strategies (Koh and Daniel 2022). Empirical studies point to the balance between learner autonomy and flexibility and the need to provide a clear guidance and meaningful engagement strategies that can positively impact student satisfaction and outcomes and emphasize that without structured support, flexibility may be a limiting influence (Russo 2025). Although Su and Yin (2025) stress that it is necessary to consider digital equity: institutions that invest in the comprehensive digital infrastructure, specific digital literacy education, and pedagogical instruments tailored to various types of learners show fairer access and better learner interaction, thus flexible learning practices are not a one-dimensional concept that needs to be unified (El Galad et al. 2024). These papers broaden the discussion of the studies to include the involvement of broader pedagogical ecosystems and explain that even though technology integration, customized instruction, and institutional support continue to be the key predictors of engagement and access, structural, equity-oriented, and instructional design aspects should be included in explanations of flexible pedagogy to ensure that their effectiveness is sustained across different contexts in higher education.

Weaknesses and Challenges

Despite showing considerable strengths, weaknesses remain which impact the full implementation of flexible pedagogy. The weaknesses observed during the study included limited learner autonomy in terms of assessment, inconsistent application of

differentiated instruction, gaps in ICT support, inadequate administrative and financial support, and limited availability of psycho-social support. These weaknesses reflect the continued reliance on teacher-centred approaches and structural constraints. For example, the limited to no student choice in assessments directly contradicts the concept of flexibility. Additionally, the present gaps in ICT and financial support produced additional burden on teachers who often cover expenses for needed added resources. Despite policies mandating the provision of learning materials, many teachers still purchase essential resources out of pocket, indicating a disconnect between funding and actual classroom needs (Maile 2022). The limited application of psycho-social support reflects that the well-being of students is not yet part of assessing students' lived experiences through flexible pedagogy. This supports Boman et al. (2025) who believed that fostering student wellbeing is essential, yet the limited application of psycho-social support indicates that assessing students' lived experiences through flexible pedagogy remains insufficient, emphasising the need for improved instructional practices and awareness of mental health in academic environments. Konadu et al. (2025) argued that mental health significantly influences motivation and academic performance, necessitating supportive instructional practices. Such weaknesses show that systemic change must occur for flexible pedagogy to flourish. Without more institutional support and alignment with student-centred principles, the ideal opportunities presented by flexible pedagogy cannot be fully realised.

Moreover, situating of these weaknesses identified in the contexts of wider systemic problems on higher education. Research on the post-pandemic environment of flexed learning shows that restricted learner control is not necessarily caused by pedagogical resistance itself but by institutional accountability frameworks that put more emphasis on standardised forms of assessment than on student agency (Koh and Daniel 2022). On the same note, empirical evidence demonstrates that the lack of consistent implementation of differentiated instruction is often linked to the absence of professional development and, in many cases, to the inability to support instructional design, especially in institutions with limited resources (Pozas et al. 2021). The study of digital inequities also demonstrates that discontinuities in ICT infrastructure overload facul-

ty work, as well as undergraduate student interactions, which intensify structural inequalities instead of mitigating those (Czerniewicz et al. 2020). Furthermore, recent mass analyses of the findings indicate that insufficient psycho-social support in flexible and hybrid systems has a negative effect on academic motivation, perseverance, and performance, which emphasizes that student well-being is not peripheral but central to an effective pedagogical change (OECD 2023). All of these studies imply that some of the weaknesses of flexible pedagogy are not single operational problems but indicators of more underlying institutional, policy, as well as equity tensions. Thus, structural investment, matching of assessment policy to the principles of learner-centred pedagogy, systematic faculty development and inculcation of mental health support into the design of academic programs is necessary to realise the transformative promise of flexible pedagogy, instead of thinking of flexibility as a mere instructional modulation.

Opportunities for Growth

The external environment provides opportunities to advance flexible pedagogy. These opportunities comprise multiple online platforms, synchronous and asynchronous blended learning, and shared resources for collaboration purposes, professional development programs, and technology enhancements of assessment. These external structures can improve teaching practices by engaging educators in collaboration, innovation, and lifelong learning. Professional development, specifically, can fill skill gaps and support the quality of pedagogical practice (Aslan and Saglam 2023). In taking advantage of these opportunities, organisations can address existing weaknesses. Professional development could provide more consistency in differentiated instruction, while resource-sharing platforms could make up for shortcomings in ICT. Lv et al. (2024) synthesise empirical research showing professional development that integrates technology and digital resources improves teachers' use of ICT in their classroom practices. While, Romero-Ochoa et al. (2025) found that ICT-supported knowledge management strategies, including sharing digital teaching resources and collaborative platforms, improve teaching practice and professional growth. Accordingly, opportunities are a strategic means of addressing limitations experienced by the organisation.

Additional clarification on the opportunities, as well as the constraints of utilizing external opportunities in the development of flexible pedagogy, is available. Different systematic evidence indicates that technology-based professional development can have a substantial positive impact on the digital competence of teachers and their innovations in instruction when it is maintained, participatory, and integrated into institutional policy frameworks and not introduced as independent training (Philipsen et al. 2019). Furthermore, post-pandemic analysis conducted by Bozkurt et al. (2022) suggests that the blended and hybrid learning models serve to increase the flexibility of instruction and learner engagement, but their performance is determined by the convergence of the curriculum and the digital maturity of the institution. Also, higher education knowledge management studies prove that professional learning communities and pedagogic innovation can only thrive through collaborative digital ecosystems, which are only institutionalised through leadership support and resource sustainability mechanisms (Bilquise and Shaalan 2023). On the other hand, other researchers warn against the use of technological platforms without considering the equity disparities and workload consequences that might increase inequalities and teacher burnout (Bond et al. 2020). According to these opinions, external opportunity like professional development programs, collaborative platforms, and technology enhanced assessment are not necessarily transformative, but the effects they have are mediated by systemic alignment, digital equity, and long-term institutional investment. Thus, although opportunities offer strategic solutions to organisational weaknesses, their role in long-term contribution to flexible pedagogy needs critical assessment, policy integration and evidence-based practice.

Threats and Risks

Although the future looks optimistic, various challenges threaten the sustainability of flexible pedagogy. These challenges include connectivity and tech issues, teacher time, challenges arising from student diversity and the associated needs, limited institutional infrastructure and investments, and readiness to change resistance from faculty and students. These threats also represent contextual features of educational environments that limit educational innovation in developing nations. Thus, con-

nectivity and infrastructure issues disrupt teaching, while workload demands and resistance to new methods slow the adoption of flexible pedagogy. Student diversity also makes it difficult to uniformly apply strategies and requires increased flexibility and adaptability for faculty and in teaching and learning. El Galad et al. (2024) found that students' diverse needs across modalities, deadlines, and assessment types necessitate more flexible approaches that go beyond one-size-fits-all methods and require educators to adapt instructional design responsively. Systematic reviews of e-learning barriers further highlight inadequate investment in technological infrastructure, lack of institutional support, and the need for comprehensive faculty training as central impediments to sustainable online and blended learning in higher education (Oulamine et al. 2025; Sareen and Mandal 2024). If these threats go unaddressed, progress will be mitigated by weaknesses and challenges, and leverage for opportunities will be neutralised. Evidence suggests that for flexible pedagogy to continue to thrive and improve in the long-term there will be needed institutional infrastructure investments, workload management, and change-readiness programs. Empirical research also shows that higher education institutions must provide comprehensive leadership development and digital capability programs to strengthen educators' preparedness and resilience, which in turn supports productivity and long-term instructional innovation (Griffin 2025).

Threats and risk puts into perspective what is being confronted by flexible pedagogy, systematic reviews indicate that insufficient infrastructure, unreliable connectivity, and technical challenges continue to be the primary roadblocks to sustainable online and blended educational delivery in higher learning, particularly in areas where digital resources are not evenly distributed and some institutions lack institutional funding to invest in this system (Afonso et al. 2025). These not only interrupt the continuity of teaching but also lead to the disengagement of students, decreased engagement, and the need to use more self-regulated learning strategies as they attempt to adjust to study requirements and unequal access to digital access (Wiitavaara and Widar 2025). In addition, the systematic reviews of the obstacles to the introduction of innovative pedagogy highlight that the resistance of the faculty to change and their low level of digital skills are usually reinforced by the lack of relevant training,

vague institutional priorities, and the lack of consistent support mechanisms combining professional growth and workload motivation (Awang et al. 2025). Recent scholarship on digital divides has made it clearer that in the presence of access, digital literacy, culturally relevant content, and institutional support are additional factors that may make it difficult to engage meaningfully with technology-mediated learning environments, which worsens the idea that risks to flexible pedagogy are not only technical but also socio-cultural and systemic (Yousofi et al. 2025). These results further elaborate the critical analysis through demonstrating that the threats to flexible pedagogy are multi-dimensional and connected with the digital infrastructure, faculty preparedness, and equity difference. Thus, to manage these risks, the focus should be placed not only on investing in technology and connectivity but also on deliberate policy frameworks, capacity building, and balanced pedagogical design to maintain the innovation and inclusivity.

Synthesis of SWOT Analysis

The SWOT analysis offers a comprehensive view of flexible pedagogy with respect to both internal and external contexts. The strengths highlight how adaptable teachers and institutions are to incorporate flexible locations, differentiated instruction, diverse resources, technology, and academic support. However, the gains established through strengths are limited by weaknesses including restricted learner autonomy, inconsistent practices, and distinctly limited institutional and ICT support which inhibit fully utilising the pedagogical flexibility. Similarly, opportunities like professional development programs, collaborative sharing of resources, and technology innovation present clear pathways to address these limitations and improve quality of instruction. Lastly, threats, such as connectivity issues, timing issues, lack of infrastructure and resistance to change, underscore contextual challenges which will hinder progress. Overall, the SWOT findings suggest that any sustainable implementation of flexible pedagogy will require a response to existing strengths, strategic use of opportunities, systematic action on internal weaknesses and anticipation of external threats. Anwar and Sulaeman (2024) supports the SWOT results, as they further argued that school possesses strengths like adequate facilities and good communication, while

weaknesses include suboptimal facility use and misaligned teaching strategies. Opportunities for improvement include scholarship programs and collaboration with research institutions to enhance educational quality. A balanced approach will help ensure flexible pedagogy transitions into a robust and inclusive approach that meets a range of learner and institutional needs.

Equally, systematic reviews in Afonso et al. (2025) posit that although flexible learning environments increase access and inclusiveness, they only work in the long-term when there is strategic alignment between pedagogical design, infrastructure investment and equity-focused policy implementation. Further insights on the comparative scholarship presented by Yousofi et al. (2025) highlight that institutional reform may cause disparities in engagement and performance to increase when digital innovation is implemented without similar institutional reform, especially in students with low digital capital. Together, these researches enhance the interpretation of the SWOT because they show that the strengths and opportunities could be optimized to the maximum when institutions strategically deal with structural weaknesses and systemic threats by incorporating policy, capacity building, and inclusive instructional design. Thus, sustainable flexible pedagogy does not mean a balance between SWOT factors but a dynamic organizational process that needs assessment, strategic resources, and evidence-based leadership.

Strategic Orientations for Sustainable Teacher Development Using the TOWS Matrix

When developing the Framework for a Sustainable Teacher Development Program (STDP), TOWS matrix approach was used to translate the situational analysis into actionable strategies by examining how internal capabilities and limitations interact with external opportunities and challenges. The TOWS Matrix serves as a systematic planning instrument that builds upon the SWOT analysis framework to formulate concrete strategies connecting internal capabilities and limitations to outside opportunities and challenges (Wehrich 1982). Additionally, Lertsakulbunlue et al. (2025) also employs the use of TOWS matrix to translate the SWOT results with strategic actions that can be taken so that students have a greater engagement in the design of the medical research curriculum, illustrating how the practi-

cally implemented TOWS can be used as a way of linking the internal and external factors and strategically plan. Furthermore, Shvardak (2021) state that TOWS-based planning enhances institutional responsiveness in case leadership commitment and performance indicators are established in the strategy implementation, suggesting that in the absence of measurable benchmarks, TOWS will likely be a purely descriptive model instead of a transformative one. Although Haile and Mekonnen (2024) have proven that converting SWOT into TOWS strategies in postsecondary education reform-based efforts enhanced curriculum responsiveness and stakeholder participation; nevertheless, they stress that participatory governance and repetition of reviewing processes are essential to avoid stagnation of strategies. In addition to this, Berkovich and Hassan (2023) emphasized that institutional reform of teacher education based on TOWS can improve the strategic alignment between agendas of professional development and digital transformation, but they also note that the structural weakness of the organization, especially faculty workload and resistance to change, have to be resolved in order to become sustainable. All these studies add to the analytical rationale of implementing TOWS in preparing the STDP in that although TOWS can successfully translate the results of a SWOT analysis into action plans, its overall effect on the system lies in the integration of leadership within the framework of accountability and a participative approach, and the alignment of the systemic policies as opposed to strategic mapping.

In the context of pedagogical adjustments during disruptions to traditional educational contexts, the TOWS approach enables educational institutions to develop specific strategies to optimise teacher development while responding to the shifting contexts for teaching and learning. The TOWS Matrix will specifically support the establishment of four strategic orientations, that is, SO (Strengths-Opportunities) Strategies, ST (Strengths-Threats) Strategies, WO (Weaknesses-Opportunities) Strategies, and WT (Weaknesses-Threats) Strategies. The TOWS matrix provides a translation from the SWOT analysis to approach strategies through mapping internal capabilities and limitations against external opportunities and challenges toward sustainability in flexible pedagogy implementation. Table 2 shows the TOWS matrix of strategies for flexible pedagogy.

Strength-Opportunity (SO) Strategies utilise internal strengths to capitalise on external prospects. Faculty expertise in differentiated instruction and access to diverse learning resources can be used to implement blended synchronous/asynchronous classes effectively. Well-prepared instructional materials and technology tools support the expansion of collaborative online teaching communities, while strong institutional academic support combined with professional development programs enhances teacher competency in flexible pedagogy. Technology integration allows the piloting of innovative assessment tools and interactive, student-centered learning modules, and flexible teaching locations and schedules provide opportunities to experiment with adaptive learning methods and new online platforms.

Weakness-Opportunity (WO) Strategies aim to address internal weaknesses by capitalising on external opportunities. Limited learner autonomy can be addressed through self-assessment and interactive evaluation tools available on online platforms. ICT and technological support gaps are mitigated by linking faculty training programs with available digital resources. Inconsistencies in the use of differentiated instruction are reduced through professional development workshops and collaborative teaching networks. Administrative and financial support insufficiencies can be managed by advocating for school-based technology provisions and flexible online submission policies. Psycho-social support for teachers and students can be enhanced via online counselling, webinars, and virtual peer dialogues.

Strength-Threat (ST) Strategies utilise internal strengths to address external challenges. Faculty expertise and well-prepared resources can help maintain instructional quality despite connectivity issues or disruptions in teaching schedules. Technology integration and flexible learning environments enable the implementation of contingency plans and alternative assessment approaches to mitigate external challenges. Organisational backing and capacity-building programs prepare educators for policy changes, infrastructural limitations, or other external constraints, thereby preserving the effectiveness of flexible pedagogy.

Weakness-Threat (WT) Strategies focus on minimising internal weaknesses while protecting against external threats. Limited learner autonomy, ICT gaps, and inconsistent differentiated instruction can be addressed by implementing standard-

Table 2: TOWS matrix of strategies for flexible pedagogy

<i>TOWS strategy type</i>	<i>Detailed strategies</i>
<i>SO StrategiesUse Strengths to Exploit Opportunities</i>	1. Use flexible teaching locations and schedules to experiment with new online platforms and adaptive learning methods. 2. Leverage faculty expertise in differentiated instruction and multiple learning resources to implement blended synchronous/asynchronous classes effectively. 3. Exploit technology integration strengths to pilot innovative assessment tools and interactive student-centred learning modules. 4. Combine strong institutional academic support with professional development programs to enhance teacher competency in flexible pedagogy. 5. Utilise well-prepared learning resources and technology tools to expand collaborative online teaching communities among teachers.
<i>ST StrategiesUse Strengths to Mitigate Threats</i>	1. Leverage diverse instructional strategies to accommodate varying student learning needs, mitigating student diversity challenges. 2. Showcase successful flexible pedagogy practices to reduce resistance from teachers and students. 3. Apply technology integration and prepared learning resources to reduce the impact of connectivity and technical issues during online classes. 4. Use institutional support and workshops to train faculty in time-efficient differentiated instruction to address time constraints. 5. Promote faculty collaboration in resource sharing to offset infrastructure limitations and lack of ICT tools.
<i>WO StrategiesMinimise Weaknesses by Exploiting Opportunities</i>	1. Reduce gaps in differentiated instruction usage by leveraging professional development workshops and collaborative teaching networks. 2. Address limited learner autonomy by introducing self-assessment and interactive assessment tools offered through online platforms. 3. Improve ICT and technological support utilisation by linking faculty training programs with available online teaching tools. 4. Enhance psycho-social support for teachers and students through online counselling, webinars, and virtual peer dialogues. 5. Mitigate administrative and financial support insufficiencies by advocating for school-based technology provisions and flexible online submission policies.
<i>WT StrategiesMinimise Weaknesses and Counter Threats</i>	1. Develop contingency plans for connectivity disruptions, such as asynchronous modules or offline tasks, to minimise class interruptions. 2. Implement standardised guidelines for differentiated instruction to reduce time burdens and maintain consistency despite student diversity. 3. Seek alternative low-cost technology solutions (e.g., open-source software) to overcome infrastructure and ICT limitations. 4. Introduce policies and training that help teachers manage flexible assessments efficiently, reducing workload and risk of student bias. 5. Increase awareness and orientation sessions for both teachers and students to reduce resistance to flexible pedagogy practices

used teaching guidelines, low-cost technological solutions, and offline or asynchronous instructional modules. Administrative and financial support limitations are managed through careful resource planning and advocacy for school-level provisions. Contingency plans for connectivity disruptions and teacher training in adaptive assessment and instructional strategies further safeguard teaching quality and ensure continuity of learning under challenging conditions.

These strategies were then incorporated into the STDP framework, ensuring a practical and evi-

dence-based roadmap for sustainable faculty development and improved teaching quality. By applying the TOWS framework, institutions can move beyond identifying challenges to designing evidence-based interventions for sustainable teacher development, ensuring that pedagogical adaptations are both responsive and forward-looking. This structured approach provides a clear roadmap for aligning faculty capabilities with environmental demands, promoting resilience, innovation, and continuity in teaching practices during periods of educational disruption.

Development of S-Framework for Sustainable Teacher Development Program (STDP)

The Sustainable Teacher Development Program (STDP) is designed to optimise strengths, remediate weaknesses, capitalise on opportunities, and minimise threats. The framework is built around five interrelated components as follows:

1. Stability (*Brace, Face and Grace*)

Ensures uninterrupted learning by promoting adaptable teaching methods, contingency planning, and alternative delivery modes to maintain quality instruction during disruptions or changing conditions.

SO Strategies: Use flexible teaching locations and schedules to experiment with new online platforms and adaptive learning methods.

ST Strategies: Leverage diverse instructional strategies to accommodate varying student learning needs, mitigating student diversity challenges.

WO Strategies: Reduce gaps in differentiated instruction usage by leveraging professional development workshops and collaborative teaching networks.

WT Strategies: Develop contingency plans for connectivity disruptions, such as asynchronous modules or offline tasks, to minimise class interruptions.

2. Skill-Building (*Train, Gain, and Sustain*)

Strengthens faculty competencies and mindsets through training, mentoring, and sharing best practices, enabling educators to adopt innovative, flexible pedagogy and sustain continuous professional development.

SO Strategies: Leverage faculty expertise and institutional support to enhance competency in blended, flexible pedagogy through workshops and collaborative communities.

ST Strategies: Showcase successful flexible pedagogy through peer demos or recognition programs to reduce resistance and motivate faculty and students to adopt innovative teaching.

WO Strategies: Address gaps in differentiated instruction by integrating training programs with online platforms and peer networks.

WT Strategies: Standardise guidelines and provide training on efficient assessments to reduce workload and instructional inconsistencies.

3. Systems (*Link, Think and Sync*)

Focuses on adopting digital tools and creating quality learning resources to enhance flexible teaching, support diverse learning needs, and promote innovative, technology-driven instruction.

SO Strategies: Exploit existing technological strengths to pilot innovative assessment tools and adaptive learning modules.

ST Strategies: Apply learning resources and ICT tools to mitigate connectivity challenges and technical issues.

WO Strategies: Link ICT training with available teaching tools to maximise technology adoption.

WT Strategies: Use low-cost, open-source technology and contingency offline modules to overcome infrastructure and connectivity limitations.

4. Support (*Guide, Provide and Revive*)

Provides institutional, psychosocial, and logistical support to sustain teacher and student welfare, ensuring manageable workloads, stress reduction, and a positive environment for effective flexible learning.

SO Strategies: Combine academic support with development programs to sustain flexible pedagogy implementation.

ST Strategies: Use institutional support and workshops to train faculty in time-efficient differentiated instruction to address time constraints.

WO Strategies: Enhance psycho-social support through webinars, virtual counselling, and peer dialogues.

WT Strategies: Introduce policies that promote fair assessment practices and reduce teacher/student stress.

5. Sustainability (*Blend, Mend and Extend*)

Strengthens partnerships and establishes clear policies that align resources and practices, ensuring long-term adoption, continuous improvement, and institutional commitment to flexible pedagogy.

SO Strategies: Foster collaborative teaching communities by expanding networks and sharing resources.

ST Strategies: Promote faculty collaboration to counter infrastructure gaps and showcase success stories to reduce resistance.

WO Strategies: Advocate for institutional support such as school-based provisions and flexible policies.

WT Strategies: Conduct awareness and orientation sessions to minimise resistance to flexible pedagogy practices.

Proposed Actionable Strategies and Policies for Sustaining Flexible Pedagogy

Grounded in the **S-Framework**, the strategies and policies to operationalise sustainable teacher development and long-term adoption of flexible pedagogy will ensure the long-term viability of flexible pedagogy, institutions must move beyond temporary adaptations and establish structured strategies and policies. These should be grounded in teacher empowerment, resource development, and institutional resilience. The following are recommended.

1. Stability (Instructional Flexibility and Resilience)

- ♦ *Contingency Planning:* Require all courses to develop continuity measures such as offline modules, asynchronous activities, and low-tech delivery options.
- ♦ *Standardisation of Flexible Practices:* Institutionalise hybrid and multimodal instruction as part of academic policies, ensuring consistency across programs.
- ♦ *Adaptive Curriculum Design:* Encourage modular course structures that allow smooth transitions between online, offline, and blended modes.

2. Skill-Building (Capacity Development and Professional Growth)

- ♦ *Continuous Professional Development:* Establish mandatory training programs on differentiated instruction, digital pedagogy, and innovative assessment.
- ♦ *Peer Learning Communities:* Formalise mentoring, coaching, and collaborative faculty groups to foster knowledge-sharing and reflective practice.
- ♦ *Recognition Mechanisms:* Implement awards, incentives, or promotion points for faculty who demonstrate innovation and resilience in flexible pedagogy.

3. Systems (Technology Integration and Resource Development)

- ♦ *Digital Infrastructure Investment:* Secure funding for stable internet connectivity, cam-

pus-wide ICT support units, and access to open-source tools.

- ♦ *Centralised Learning Resource Hubs:* Create repositories of curated teaching resources, lesson plans, and assessment tools accessible to faculty.
- ♦ *Data Driven Monitoring:* Use learning management systems (LMS) analytics to track student engagement, instructional effectiveness, and areas needing support.

4. Support (Systems of Care and Well-Being)

- ♦ *Psychosocial Support Programs:* Provide counselling, wellness webinars, and peer dialogue platforms for both teachers and students.
- ♦ *Workload and Time Management Policies:* Establish guidelines on teaching load distribution and compensation for additional flexible learning tasks.
- ♦ *Student Support Mechanisms:* Enhance access to tutorial services, study guides, and digital literacy training to reduce academic strain.

5. Sustainability (Collaboration, Policy and Sustainability)

- ♦ *Policy Alignment and Compliance:* Institutionalise flexible pedagogy as a permanent academic standard, with compliance monitoring and accountability mechanisms.
- ♦ *Institutional Partnerships:* Forge collaborations with other universities, government agencies, and industry partners for resource sharing and joint capacity building.
- ♦ *Continuous Feedback and Evaluation:* Conduct periodic audits, tracer studies, and student/faculty surveys to refine flexible teaching strategies.
- ♦ *Long-Term Investment Plans:* Secure funding allocations in annual budgets to sustain technological upgrades, training programs, and welfare initiatives.

The S-Framework of the Sustainable Teacher Development Program (STDP) is more of a conceptual and strategic development. It is the result of the synthesis of the SWOT and TOWS analysis, as it offers a holistic model that suggests how a sustainable development of teachers can be accomplished

that would facilitate flexible pedagogy. The framework, which forms institutional responses through five interrelated components of Stability, Skills, Systems, Support and Sustainability, determines the main areas that need to be reinforced and aligned to ensure long-term pedagogical resilience. It serves its purpose in demystifying the connections between institutional strengths, weaknesses, opportunities, and threats providing an organised perspective of planning and decision-making instead of dictating what to do.

To the contrary, the deliberation of the suggested actionable strategies and policies is operational and implementation-based. It is based on the S-Framework, colonising the elements in the framework into tangible, context-specific measures, institutional policies and mechanisms that can be applied directly by state colleges. Whereas the S-Framework covers what needs to be given strategic focus, the actionable strategies cover the way these areas can be operationalised by use of contingency planning, professional development, investment in technology, provision of psychosocial support, alignment of policy, and constant evaluation. The framework and the suggestions provided can be considered a logical sequence of the idea of conceptual design and practical execution, which will guarantee the flexibility of pedagogy as a concept that might be both theoretically and practically justified.

CONCLUSION

The findings of the study highlight that sustaining flexible pedagogy in a state college requires a balanced integration of institutional strengths, systematic responses to weaknesses, and proactive engagement with emerging opportunities while mitigating persistent threats. The SWOT analysis revealed that faculty adaptability, technological integration, varied instructional resources, and institutional academic support provide a solid groundwork for flexible teaching. However, weaknesses, including limited learner autonomy, inconsistent differentiated instruction, insufficient ICT and financial support, and gaps in psychosocial services, continue to constrain the full realisation of flexible pedagogical goals. External opportunities, such as professional development, resource-sharing platforms, and advancements in educational technology, offer avenues to strengthen current practices,

while threats related to connectivity issues, workload pressures, infrastructure limitations, and resistance to change pose ongoing risks to sustainability.

The TOWS analysis provided strategic directions to align internal capacities with external conditions, generating targeted SO, ST, WO and WT strategies that reinforce teacher competence, enhance resilience, and support long-term pedagogical innovation. These strategies served as the foundation for the development of the Sustainable Teacher Development Program (STDP), an evidence-based, context-sensitive framework that operationalises stability, skill-building, systems enhancement, and support mechanisms. Through its five components of Stability, Skill-Building, Systems, Support, and Sustainability, the STDP offers a structured and practical roadmap for institutions aiming to institutionalise flexible pedagogy as a durable response to educational disruption.

Ultimately, the study concludes that flexible pedagogy can only thrive when institutions adopt a holistic, strategic, and forward-looking approach. Strengthening teacher readiness, improving technological infrastructures, enhancing psychosocial and administrative support, and fostering collaborative learning cultures are essential in promoting sustainable and high-quality teaching practices. By implementing the strategies outlined in the TOWS matrix and operationalising the STDP framework, state colleges can build a resilient educational environment that prepares both teachers and students for evolving learning landscapes. The study underscores that sustainable teacher development is not merely an institutional initiative but a long-term commitment to continuous improvement, innovation, and adaptability in the face of ongoing and future disruptions.

RECOMMENDATIONS

The researchers make the following recommendations based on the study. The flexible pedagogy implemented in state colleges ought to be a holistic, strategic and progressive approach that strategically combines the institutional strengths, addresses the weaknesses, capitalises on opportunities and counter threats. Regular planning can be used to guide evidence-based decision-making and implement flexible pedagogy that is responsive, resilient, and sustainable in the face of changing educational circumstances through the utilisation of SWOT-TOWS analyses as common planning instruments.

It is advised that institutions should operationalise the STDP as a long-term central framework of enhancing teacher competence, resilience, and adaptability. The state colleges will be able to improve teacher preparation, encourage pedagogical change, and make the flexible pedagogy a permanent solution to the disruption of education by introducing its five elements of Stability, Skill-Building, Systems, Support and Sustainability.

In an attempt to make flexible pedagogy viable in the long run, the state colleges are recommended to strengthen technological infrastructure, psychosocial and administrative support, and collaborative learning cultures. Comprehensive surveillance, reflective practice and institutional nimbleness are necessary in maintaining high quality teaching and a culture of continuous improvement in the face of present and future interruption.

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