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THE USE OF BLENDED INSTRUCTIONAL STRATEGIES DURING CRISIS SITUATIONS IN PRIMARY SCHOOLS IN BUEA SUBDIVISION, SOUTH WEST REGION OF CAMEROON

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Abstract

Schooling in Buea Subdivision, making the sole reliance on conventional classroom instruction increasingly fragile. This study examined the adoption, perceived effectiveness and implementation challenges of blended instructional strategies in crisis-affected primary schools. A descriptive cross-sectional survey with quantitative and qualitative components was conducted among headteachers. Of the 217 headteachers in Buea Subdivision, 144 were accessible through the Buea Headteachers' WhatsApp forum, from which 72 submitted completed online questionnaires. Closed-ended items were analysed using frequencies and percentages, while responses to an open-ended question were organised thematically. The findings show that 91.7% of respondents reported using a combination of face-to-face and online instruction. Nevertheless, delivery remained predominantly classroom-based: mean syllabus coverage was 61.9% through face-to-face teaching and 20.1% online. Most respondents rated blended instruction as effective or very effective, reported improved learning outcomes, and described pupil feedback as positive. Implementation was constrained by limited access to devices and internet services, insufficient teacher preparation for digital pedagogy, weak parental support, online engagement difficulties, planning demands and unreliable electricity. The study concludes that blended instruction can strengthen educational continuity during crises, but its contribution will remain unequal and supplementary unless infrastructure, teacher capacity, school–home communication and low-bandwidth delivery systems are strengthened.

Keywords:

Blended instruction, crisis education, educational continuity, primary schools.

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Résumé

La crise anglophone prolongée au Cameroun et la pandémie de COVID-19 ont perturbé à plusieurs reprises la scolarisation dans l'arrondissement de Buea, révélant la fragilité d'un enseignement reposant uniquement sur le présentiel. Cette étude analyse l'adoption,

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l'efficacité perçue et les difficultés de mise en œuvre des stratégies pédagogiques hybrides dans les écoles primaires touchées par les crises. Une enquête transversale descriptive, comportant des volets quantitatif et qualitatif, a été menée auprès de directeurs et directrices d'école. Sur les 217 responsables recensés dans l'arrondissement de Buea, 144 étaient accessibles par le forum WhatsApp des chefs d'établissement de Buea; 72 ont rempli le questionnaire en ligne. Les questions fermées ont été analysées à l'aide de fréquences et pourcentages, tandis que les réponses à une question ouverte ont fait l'objet d'un regroupement thématique. Les résultats indiquent que 91,7 % des répondants combinaient enseignement en présentiel et activités en ligne. Toutefois, la couverture du programme restait dominée par le présentiel, avec une moyenne de 61,9 %, contre 20,1 % en ligne. La majorité jugeait l'approche hybride efficace, signalait une amélioration des apprentissages et rapportait des réactions positives des élèves. Les principaux obstacles concernaient l'accès limité aux appareils et à Internet, la formation insuffisante des enseignants, l'appui parental, l'engagement des élèves, le temps de préparation et l'instabilité de l'électricité. L'étude conclut que l'enseignement hybride peut renforcer la continuité éducative, à condition d'améliorer les infrastructures, les compétences enseignantes, la communication école–famille et les solutions à faible consommation de données.

Mots-clés : *enseignement hybride, éducation en situation de crise, continuité éducative, écoles primaires.*

Introduction

Educational provision in Cameroon has been threatened by overlapping security, political and public-health crises. In the Far North, the Boko Haram insurgency exposed schools and communities to violence and displacement. In the North-West and South-West Regions, protests that began in 2016 over legal and educational grievances developed into a protracted armed conflict. School boycotts, "ghost-town" operations, threats, attacks, displacement and intermittent closures reduced the regularity of teaching and learning. Humanitarian reporting has repeatedly shown that insecurity affects not only access to school but also teacher deployment, family mobility, learner protection and the functioning of education administration (International Crisis Group, 2017; United Nations Office for the Coordination of Humanitarian Affairs [OCHA], 2018; United Nations Children's Fund [UNICEF], 2018, 2020).

Buea, the administrative capital of the South-West Region, has experienced recurrent interruptions linked to the Anglophone crisis. Even where schools remain formally open, movement restrictions and uncertainty may prevent pupils and teachers from attending schools consistently. The COVID-19 school closures of 2020 added a different but related disruption, compelling education systems to consider remote delivery at a time when electricity, devices, connectivity and digital skills were unevenly distributed. In Cameroon, the pandemic response exposed long-standing weaknesses in distance education and widened concern about the exclusion of learners who could not access broadcast or internet-based instruction (Béché, 2020; UNESCO, 2020; UNICEF, 2021).

These experiences make educational continuity a central concern. Continuity does not merely mean that content is distributed while schools are closed. It also requires sustained teacher–pupil contact, curriculum progression, opportunities for feedback,

feasible assessment and arrangements that do not systematically exclude children from low-income or poorly connected households. Crisis-responsive instruction must therefore be flexible enough to change delivery modes while remaining pedagogically purposeful and socially inclusive.

Blended instruction is the deliberate integration of face-to-face teaching with technology-mediated or remote learning activities within a coherent instructional design (Garrison & Vaughan, 2008; Graham, 2006). Its defining feature is not the simple presence of digital tools, but the purposeful allocation of learning activities across modalities so that each mode contributes to the intended outcomes. Depending on local conditions, the remote component may include learning-management systems, video lessons, WhatsApp messages, telephone calls, radio, television, downloadable materials or printed take-home tasks supported by teacher follow-up. This distinction is important in crisis settings. Hodges et al. (2020) differentiate carefully designed online learning from emergency remote teaching, which is introduced rapidly to preserve access during disruption. In Buea, blended instruction during shutdowns is likely to resemble a pragmatic continuity arrangement rather than a mature online programme. Face-to-face sessions may be organised whenever movement and security permit, while phones, messaging applications, printed tasks and other channels maintain contact during interruptions. A blended strategy is therefore best understood as a resilient system of instructional interaction rather than as a fixed percentage of online teaching.

For this study, implementation of blended instructional strategies refers to whether schools combine in-person and remote components, how frequently the combination is used and the proportion of the syllabus reportedly covered through each mode. Effectiveness refers to headteachers' judgements about whether the strategy maintains learning, improves outcomes and elicits favourable pupil responses. Challenges refer to infrastructural, pedagogical, organisational and household-level conditions that restrict participation or instructional quality.

The study is principally informed by constructivist learning theory and supported by the Technology Acceptance Model and the Technological Pedagogical Content Knowledge framework. Constructivism views learning as an active process in which learners build meaning by connecting new experiences with prior knowledge and by interacting with teachers, peers and tasks (Bruner, 1961; Vygotsky, 1978). Blended environments can support this process by combining guided classroom interaction with independent practice, collaborative communication and access to varied learning resources. In primary education, however, such activity requires age-appropriate scaffolding, feedback and substantial support from teachers and families.

The Technology Acceptance Model proposes that perceived usefulness and perceived ease of use influence whether users accept a technology (Davis, 1989). It is relevant because headteachers and teachers may value blended instruction while still using its online component sparingly if platforms are difficult to navigate, data are expensive or devices are unavailable. The Technological Pedagogical Content Knowledge framework further argues that effective technology integration depends on the interaction of

technological knowledge, pedagogical knowledge and subject-matter knowledge (Mishra & Koehler, 2006). Consequently, access to equipment alone cannot produce effective blended instruction; teachers must know how to redesign content, interaction, feedback and assessment for different delivery channels.

Statement of the problem

Primary schools in Buea operate in an environment where conventional schooling can be interrupted with little notice. Prolonged closures, insecurity, movement restrictions and public-health crises have reduced instructional time and threatened equitable access to quality education. Although blended strategies offer a means of maintaining contact and learning when pupils cannot attend school normally, the conditions under which they are being used in Buea are insufficiently documented. It is unclear how widely headteachers have adopted these strategies, how much teaching is actually delivered online, whether school leaders perceive the approach as effective, and which barriers most strongly constrain implementation.

The evidence gap is consequential. Policies that assume universal access to internet-enabled learning may deepen inequality, while a return to face-to-face teaching alone leaves schools vulnerable to renewed interruption. Locally grounded evidence is needed to determine whether blended instruction is functioning as a meaningful continuity mechanism or merely as a limited supplement available to better-resourced schools and families. This study addresses this problem from the perspective of primary-school headteachers, who coordinate instruction, communicate with families and oversee school responses during crises.

Research questions

The study was guided by three questions. First, to what extent are blended instructional strategies implemented during crises in primary schools in Buea Subdivision? Second, how effective do headteachers perceive blended instructional strategies to be in maintaining educational continuity and quality? Third, what challenges affect the implementation of blended instructional strategies in these schools?

Research objectives

The objectives were to determine the level and frequency of adoption of blended instructional strategies during crises; assess headteachers' perceptions of their effectiveness for continuity, learning outcomes and pupil response; and identify the principal infrastructural, pedagogical, organisational and household-related implementation challenges.

Justification of the study

The study provides context-specific evidence for education authorities, school leaders and development partners seeking practical ways to reduce learning disruption in Cameroon's crisis-affected regions. By distinguishing reported adoption from the actual balance of online and face-to-face syllabus coverage, it avoids treating the existence of a digital tool as evidence of substantive implementation. The findings can inform low-bandwidth continuity plans, teacher professional development, device and connectivity support, parent engagement and school-level monitoring. The study also contributes to

addressing the limited empirical evidence gap on the use of blended instructional to ensure continuity and quality education during crises in the context under study.

Literature Review

Blended learning emerged from efforts to combine the interaction and social presence of classroom instruction with the flexibility of online learning. Garrison and Kanuka (2004) argue that its transformative potential lies in redesigning learning experiences rather than reproducing classroom routines electronically. Graham (2006) similarly presents blended learning as an integration problem in which decisions about time, place, media and interaction must follow learning purposes. In school settings, models may range from classroom teaching supplemented with digital resources to the rotation arrangements and flexible schedules in which pupils move between supervised and remote activities (Horn & Staker, 2015).

Evidence on online and blended learning generally indicates that outcomes depend on design quality, learner support and the amount of productive learning time rather than on technology itself. A major review by Means et al. (2010) found advantages for blended conditions in many studies, but cautioned that additional learning time and instructional elements often contributed to the observed effects. Definitions also vary substantially across the literature, which makes it necessary for researchers to specify the particular combination of modalities under examination (Singh & Thurman, 2019). In this study, blended instruction includes any planned combination of face-to-face teaching and remote or online activities used to maintain learning during disruption or crises situations.

Crisis conditions alter the criteria by which blended learning should be judged. During an emergency, the central questions are whether learners can be reached, whether interaction continues, whether materials are aligned with the curriculum and whether progress can be monitored. The Inter-agency Network for Education in Emergencies (INEE, 2020) recommends selecting distance modalities according to access, age, disability, safety, teacher capacity and available infrastructure. This supports a layered model in which print, radio, basic mobile communication and internet-based resources complement one another rather than assuming that one platform can reach every learner.

The COVID-19 pandemic generated extensive use of emergency remote teaching, often without the preparation associated with established online programmes. Hodges et al. (2020) warn that evaluations should recognise the temporary, improvised and constrained nature of these arrangements. Across low- and middle-income settings, remote participation was strongly conditioned by household income, device ownership, electricity, connectivity, parental literacy and the availability of quiet study space. Consequently, the same response that preserved learning for connected households could exclude those already facing educational disadvantage (UNESCO, 2020; World Bank, 2020).

Research during the pandemic also demonstrates the importance of structured human support. In Botswana, a low-technology intervention combining curriculum-linked text

messages with telephone support improved learning outcomes, illustrating that basic mobile tools can be useful when they organise practice and preserve contact rather than merely distribute content (Angrist et al., 2022). The broader evidence from developing countries likewise shows heterogeneous effects of educational technology and stronger results where interventions are aligned with curriculum, targeted to learner needs and accompanied by implementation support (McEwan, 2015).

Learning loss research reinforces the urgency of continuity planning. Kaffenberger (2021) shows that short-term learning shocks can generate long-term consequences when curricula proceed without remediation. UNICEF (2021) similarly documents the global scale of school disruption during the first year of the pandemic. These findings suggest that crisis-responsive blended learning should include diagnostic checks, realistic content priorities and opportunities to recover missed foundational skills. For primary pupils, teacher feedback and caregiver communication are particularly important because independent online study is developmentally and practically difficult.

The Anglophone crisis has produced an unstable educational environment in the North-West and South-West Regions. The conflict developed from long-standing concerns about the place of English-language legal and educational institutions within a predominantly Francophone state and intensified after protests in 2016 (International Crisis Group, 2017). Humanitarian reports describe school closures, attacks and threats, displacement and irregular attendance, although the intensity and pattern of disruption vary across communities and over time (OCHA, 2018; UNICEF, 2018, 2020). In such a setting, education delivery is constrained simultaneously by security and by the digital divide. Families may relocate, avoid travel on particular days, share a single phone, lack money for data or have no dependable electricity. Schools may have limited capacity to track pupils after displacement or to ensure that take-home activities are completed. The COVID-19 experience confirmed that national distance-learning responses could not guarantee equal participation where technological and household resources were uneven (Béché, 2020).

The available evidence therefore favours context-sensitive combinations rather than online-only solutions. Print packages and brief face-to-face contact may maximise access, while WhatsApp, telephone calls or other low-bandwidth tools provide reminders, explanations and feedback. Where internet-based learning is feasible, it should supplement rather than displace accessible alternatives. This approach is consistent with INEE's (2020) emphasis on multiple delivery channels and with the World Bank's (2020) recommendation that remote education policy prioritise engagement, equity and teacher support.

Teacher competence is a recurrent determinant of blended-learning quality. The TPACK framework explains why knowing how to operate a platform is insufficient: teachers also need to decide how particular technologies can present subject content, prompt participation, support practice and generate evidence of learning (Mishra & Koehler, 2006). In crisis conditions, these decisions must often be made quickly and with limited resources. Practical professional development should therefore focus on a small number

of reliable tools, low-data lesson design, formative assessment, inclusive communication and procedures for following up absent learners. Effective professional development is sustained, content-focused, collaborative and connected to teachers' working conditions (Darling-Hammond et al., 2017; Desimone, 2009). One-off workshops may raise awareness but are unlikely to resolve day-to-day problems involving lesson preparation, feedback, device sharing and online engagement. School leaders can support implementation through peer planning, common communication schedules, resource sharing and monitoring routines.

Acceptance by teachers, pupils and parents also matters. Davis's (1989) model suggests that users are more likely to adopt a system when it is useful and manageable. Rogers (2003) adds that innovations spread according to their perceived advantage, compatibility, complexity, trialability and visibility. Parents of primary pupils may resist remote activities if they are costly, unfamiliar or difficult to supervise. Visible benefits, simple guidance and realistic expectations are therefore necessary to build trust.

Recent research strengthens the case for treating blended instruction as an equity and systems issue rather than simply as a technology choice. Martin, Ceviker, and Gezer (2024) reviewed 77 studies on the educational digital divide and found that socioeconomic status, geography, gender, school type and parents' educational knowledge shaped access and use. Importantly, the review showed that research and interventions have concentrated more heavily on hardware and connectivity than on utilization, cognitive engagement and affective dimensions of digital participation. The authors therefore recommend combining technology provision with training and continuing support for teachers, pupils and parents.

Evidence from research with children also cautions against assuming that any digital exposure is educationally beneficial. Caballero-Julia, Martín-Lucas, and Andrade-Silva (2024), in a systematic review of screen use and educational outcomes in childhood, identified both potential benefits and risks and emphasised the importance of teacher training and digital literacy for children and parents. Similarly, Arabiat et al. (2023) found that interactive digital technologies could support literacy and numeracy when used in learning contexts, while noting that effects depended on the type, intensity and context of use. For primary schools, these findings mean that a voice note, video, electronic book or messaging activity is most useful when it is connected to a clear learning objective, accompanied by explanation or modelling, and followed by interaction or feedback. The implication for crisis settings is that low-bandwidth tools should be designed as part of an instructional sequence, not used merely as channels for distributing worksheets.

Recent Sub-Saharan African evidence points to the same interaction between opportunity and constraint. Gyamerah et al. (2024), studying 25 teacher educators from 15 institutions in Ghana, reported that emergency remote teaching created opportunities for professional learning, asynchronous study and peer collaboration. At the same time, participants described low engagement, unsuitable or unfamiliar platforms, inadequate technological resources and insufficient preparation. Their findings are useful for interpreting the present study because they show why positive attitudes toward remote

teaching can coexist with modest actual use. Teachers may recognise the value of continuity while still selecting familiar, low-cost tools and using them intermittently because more demanding options are not feasible.

A quasi-experimental study from Nigeria provides additional evidence that the instructional design of the blended learning matters for learning outcomes. Egara and Mosimege (2024) reported that secondary learners who received blended mathematics instruction achieved stronger learning and retention outcomes than learners taught through conventional instruction alone. However, the study was conducted in schools that already had information and communication technology facilities.

Taken together, this newer literature highlights three principles for the current study. First, continuity is multidimensional and includes access, participation, feedback and learning recovery. Second, the effectiveness of a blended learning arrangement depends on mediation and instructional design, not on the presence of a platform. Third, implementation must be evaluated against local feasibility.

The literature supports blended instruction as a potentially resilient response, but it also warns against equating adoption with equitable or high-quality implementation. Cameroon-specific evidence remains largely descriptive, and limited research has quantified the modality mix used by primary schools in Buea or linked adoption to headteachers' perceptions and reported barriers.

Methodology

Research design and setting

The study used a descriptive cross-sectional survey design with quantitative and qualitative components. The design was appropriate for documenting current practices, perceptions and challenges among school leaders without manipulating instructional conditions. The study was conducted in public and private primary schools in Buea Subdivision, Fako Division, South-West Region of Cameroon, an area affected by recurrent interruptions associated with the Anglophone crisis.

Population, sampling and participants

The target population comprised 217 primary-school headteachers in Buea Subdivision. At the time of data collection, 144 public and private school headteachers were reachable through the Buea Headteachers' WhatsApp forum, which served as the accessible sampling frame. Participants were selected purposively because their instructional-leadership responsibilities gave them direct knowledge of school continuity arrangements. Access through the existing online forum also introduced an element of convenience sampling. Seventy-two headteachers completed the questionnaire, representing 50.0% of the accessible forum.

The respondent profile in the source data indicates that approximately three-quarters were women and that many were in their forties. Most held the professional Grade One Teacher qualification, although academic qualifications varied. Several had relatively limited experience as headteachers but more than ten years of experience in education.

These characteristics positioned respondents to report both operational and pedagogical aspects of crisis response.

Instrument and data collection

Data were collected through an online questionnaire created in Google Forms. The instrument covered background characteristics, awareness and adoption of blended instruction, frequency of use, estimated syllabus coverage by modality, perceived effectiveness, perceived influence on learning outcomes, pupil feedback and implementation challenges. Most items were closed-ended, with one open-ended question allowing respondents to describe challenges and needs in their own words.

A link to the questionnaire was posted in the headteachers' WhatsApp forum together with a cover note explaining the purpose of the study and inviting voluntary participation. Reminders were posted periodically over a two-month period to improve response. Because the instrument was administered remotely, participation depended on forum membership, device access and willingness to respond. No formal scale reliability coefficient was available for the descriptive item set; the findings should therefore be interpreted as reported practices and perceptions rather than as scores from a validated psychometric scale.

Data analysis

Google Forms responses were exported to a spreadsheet and then to SPSS for analysis. Frequencies and percentages were calculated for categorical items. Means and medians summarised respondents' estimates of syllabus coverage through online and face-to-face instruction. For the open-ended responses, similar statements were grouped into recurring themes, including device shortages, internet limitations, insufficient teacher training, pupil engagement, planning time, resistance or limited household support, collaboration and electricity. Because respondents could select or mention more than one challenge, challenge percentages are not mutually exclusive and do not sum to 100%.

Ethical considerations

The cover note explained the study's purpose and informed participants that responding was voluntary. Headteachers could decline to complete the questionnaire, and the reported analysis did not identify individual respondents or schools. The study used aggregated results and short thematic summaries. Given the sensitivity of information in a conflict-affected setting, the manuscript avoids reporting operational details that could expose particular schools or respondents.

Findings

Adoption and frequency of blended instruction

Sixty-six of the 72 headteachers (91.7%) reported that their schools used both face-to-face and online components during crisis-related disruption, while six (8.3%) did not accept and took the "no" option. The result indicates widespread nominal adoption, although later findings show that the online share of instruction remained modest.

Table 1

Adoption of blended instruction (N = 72)

Response	Frequency	Percentage
Yes	66	91.7
No	6	8.3

Note. Percentages may not total 100 because of rounding or item non-response.

Table 2

Frequency of use among schools reporting adoption (n = 66)

Frequency of use	Frequency	Percentage
Daily	24	36.4
Weekly	18	27.3
Monthly	9	13.6
Missing response	9	13.6
Not at all during the reference period	6	9.1

Note. Percentages may not total 100 because of rounding.

Syllabus coverage by modality

Respondents estimated that an average of 20.1% of the syllabus was covered online, with a median of 10.0%. By contrast, mean face-to-face coverage was 61.9% and the median was 80.0%. The difference between the means and medians suggests variation across schools, but the central pattern is clear: blended instruction was used mainly to supplement classroom teaching rather than replace it. The comparatively low median for online coverage indicates that at least half of respondents reported very limited online delivery.

Table 3

Reported syllabus coverage by instructional modality

Statistic	Online (%)	Face-to-face (%)
Mean	20.1	61.9
Median	10.0	80.0

Note. Percentages may not total 100 because of rounding or item non-response.

Perceived effectiveness, learning impact and pupil feedback

Headteachers' evaluations were generally favourable. Forty-eight respondents (66.7%) rated blended instruction effective and nine (12.5%) rated it very effective. Nine (12.5%) were neutral, three (4.2%) considered it ineffective and three (4.2%) did not respond. Regarding learning outcomes, 42 headteachers (58.3%) reported some improvement and 12 (16.7%) reported significant improvement. Nine (12.5%) perceived no impact, while nine (12.5%) reported some degree of deterioration.

Pupil feedback was reported for the 66 schools identified as adopters. Forty-five headteachers (68.2%) described pupils' feedback as positive and three (4.5%) as very positive. Twelve (18.2%) described it as neutral, while six (9.1%) reported negative feedback. The findings indicate perceived benefit but also show that favourable attitudes were not universal.

Table 4

Headteachers' perceptions of effectiveness, impact and pupil feedback

Domain	Response option	Frequency	Percentage
Perceived effectiveness	Effective	48	66.7
	Very effective	9	12.5
	Neutral	9	12.5
	Ineffective	3	4.2
	No response	3	4.2
Perceived learning impact	Some improvement	42	58.3
	Significant improvement	12	16.7
	No impact	9	12.5
	Deterioration	6	8.3
	Significant deterioration	3	4.2
Pupil feedback (n = 66)	Positive	45	68.2
	Very positive	3	4.5
	Neutral	12	18.2
	Negative	6	9.1

Note. Percentages may not total 100 because of rounding or item non-response.

Implementation challenges

The most prevalent selected items concerned access and capacity. Limited access to devices and the need for more teacher training were each reported by 83.3% of respondents. Better access to technology and lack of internet access were each reported by 79.2%. Three-quarters identified the need for increased parental involvement and a lack of internet access for pupils. Other commonly reported issues included insufficient computers or tablets, lack of training, limited collaboration among headteachers, difficulty engaging pupils online, difficulty navigating platforms and limited planning time.

The open-ended responses reinforced these patterns. Device shortages and internet limitations were the dominant themes, followed by inadequate preparation for digital pedagogy and difficulty sustaining pupil attention and participation remotely. Respondents also described time pressure, parental resistance or lack of suitable phones, weak peer collaboration and occasional electricity problems. Together, the quantitative and qualitative findings show that implementation difficulties were not purely technical. They formed an interdependent system in which weak infrastructure increased workload, limited teachers' choice of pedagogy and shifted additional responsibility to households.

Table 5

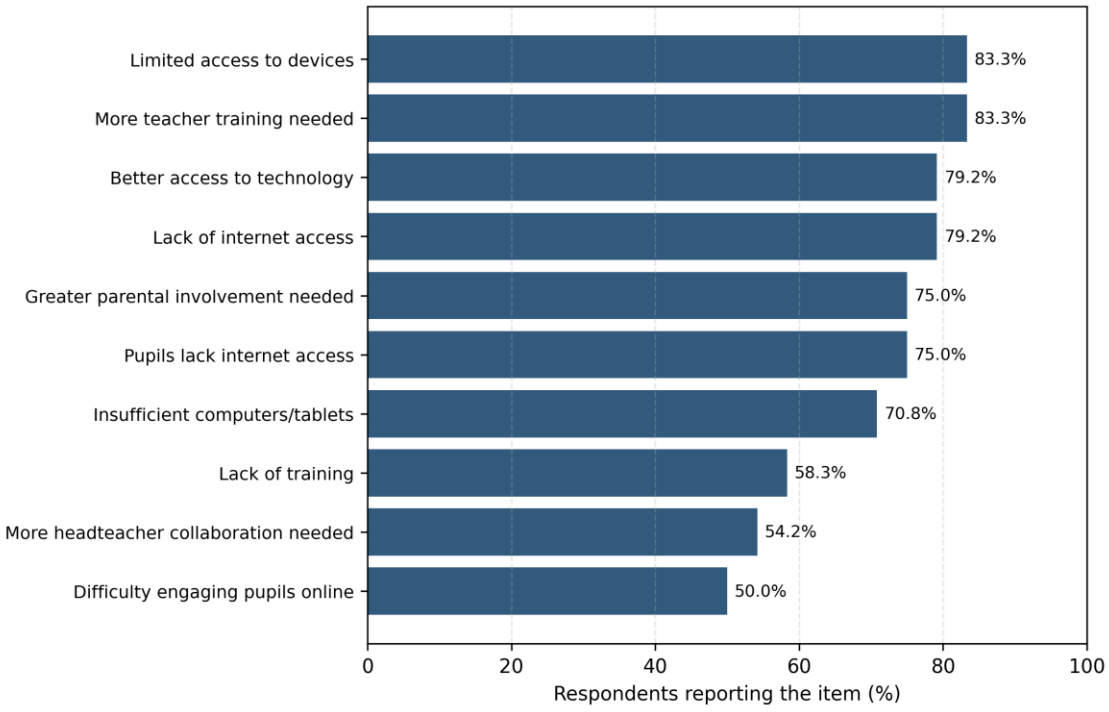
Selected implementation challenges and support needs (N = 72)

Challenge or support need	Percentage reporting
Limited access to devices	83.3
More teacher training needed	83.3
Better access to technology	79.2
Lack of internet access	79.2
Greater parental involvement needed	75.0
Pupils lack internet access	75.0
Insufficient computers/tablets	70.8
Lack of training	58.3
More collaboration among headteachers needed	54.2
Difficulty engaging pupils online	50.0
Difficulty navigating online platforms	50.0
Limited time for planning and preparation	41.7

Note. Multiple responses were permitted; percentages therefore do not sum to 100. Closely related items are retained because they were separate questionnaire response options.

Figure 1

Ten most frequently reported implementation challenges and support needs



Note. Percentages are based on multiple-response items.

Summary of findings

The study produced four main findings. The use of blended instructional strategies during crises situations in primary schools in Buea Subdivision was reported by a large majority

of headteachers. Its use was relatively frequent among adopters, yet the actual modality mix remained strongly oriented towards face-to-face teaching. Most headteachers perceived the use of blended instructional strategies during crises situations in primary schools as effective and associated it with improved learning and positive pupil feedback. However, online participation and instructional quality were constrained by lack of devices, poor connectivity, teachers' capacity, engagement, planning demands, household support and electricity.

Discussion

High adoption but limited online intensity

The combination of 91.7% reported adoption and a median online syllabus coverage of only 10% suggests that schools used blended instruction as a flexible continuity mechanism rather than as a balanced or online-dominant model. This interpretation accords with Hodges et al.'s (2020) distinction between planned online learning and emergency remote teaching. Headteachers appear to have maintained classroom instruction whenever feasible and used remote channels to bridge periods of interruption, distribute tasks or sustain communication.

The pattern is contextually rational. Face-to-face teaching provides immediate explanation, supervision and social interaction and does not require every household to possess a connected device. At the same time, exclusive dependence on the classroom is not appropriate during crises. A limited online component may therefore represent adaptation to constrained conditions rather than weak commitment. Nevertheless, low online intensity also means that learning continuity can fail when physical access is impossible for extended periods.

Perceived effectiveness

The favourable effectiveness ratings and pupil feedback indicate that headteachers saw value in blended instructional strategies. From a constructivist perspective, this value may arise when remote tasks extend classroom learning, allow repeated practice and preserve interaction between pupils, teachers and families. However, constructivist benefits require more than sending assignments. Pupils need understandable tasks, dialogue, feedback and opportunities to connect new material with prior knowledge (Bruner, 1961; Vygotsky, 1978).

The findings on the perceived effectiveness of blended learning are also compatible with the wider evidence that structured low-technology support can protect learning. Angrist et al. (2022) demonstrate that simple mobile communication can improve outcomes when messages and calls are curriculum-linked and regular. The present study did not measure pupil achievement directly, so headteachers' positive perceptions cannot be treated as causal evidence. They nonetheless suggest that a practical, supported blend is acceptable to many school leaders and pupils.

Infrastructure and equity

The dominance of device and connectivity barriers confirms that the use of blended instructional during crises is constrained by these barriers. Where phones are shared, data are expensive or networks and electricity are unreliable, online participation

becomes intermittent. These constraints help explain the gap between adoption and online syllabus coverage. They also create an equity problem because pupils from better-resourced households are more able to participate consistently. Similar concerns were documented during the COVID-19 response in Cameroon and internationally (Béché, 2020; UNESCO, 2020; World Bank, 2020).

The policy implication is not that schools should abandon remote learning. Rather, digital channels should be embedded in a layered system. Printed tasks, telephone contact, radio where available and brief, safe face-to-face support can provide alternatives for pupils without stable internet. Schools should record which households can access each channel and avoid making participation in a single platform the sole route to instruction or assessment.

Teacher knowledge, workload and professional support

The high demand for training and reported difficulties with platform navigation, engagement and planning show that implementation is pedagogical as well as infrastructural. The TPACK framework predicts this finding: teachers require an integrated understanding of technology, pedagogy and content to choose suitable activities and adapt them for remote use (Mishra & Koehler, 2006). A technically functional WhatsApp group, for example, will not ensure learning if tasks are too difficult, feedback is delayed or participation cannot be monitored.

Professional development should therefore move beyond introductory tool demonstrations. It should help teachers prepare short low-data lessons, structure weekly routines, use voice notes or calls strategically, give rapid formative feedback, adapt assessments and identify pupils who have disengaged. Evidence on teacher development favours sustained, collaborative and job-embedded support over isolated workshops (Darling-Hammond et al., 2017; Desimone, 2009). Headteacher networks can serve as communities of practice for sharing materials and solving implementation problems.

Acceptance, parental involvement and school leadership

Most primary pupils depend on adults for access to devices, data, study time and task supervision. The prominence of parental involvement in the findings therefore reflects a structural feature of primary-level blended learning. Parents may be unable or unwilling to support remote activities because of cost, literacy, workload, unfamiliarity or doubts about their value. According to Davis (1989) and Rogers (2003), adoption is more likely when an innovation is demonstrably useful, compatible with existing practices and simple to use.

Schools can improve acceptance by communicating predictable schedules, limiting the number of platforms, explaining the purpose and expected duration of tasks, and offering offline alternatives. Headteachers also have a coordination role. Common school guidelines can prevent teachers from overwhelming families with uncoordinated messages and can establish minimum expectations for contact, feedback, safeguarding and record-keeping during crises situations.

These findings are also consistent with the more recent evidence on digital equity. Martin et al. (2024) show that the digital divide is multidimensional: access to a device or network is only the first layer, while meaningful use depends on skills, support, confidence and the social conditions surrounding learning. The findings of this study reflect this pattern. Device shortages and connectivity problems were prominent, but respondents also identified training needs, planning difficulties, pupil engagement and parental involvement. The combination indicates that schools were not facing a single infrastructure deficit; they were managing an implementation ecosystem in which household resources, teacher knowledge and school coordination interacted.

Recent literature also helps explain why headteachers reported generally favourable perceptions despite limited online coverage. Gyamerah et al. (2024) found that emergency remote teaching could strengthen professional learning and collaboration even when teachers experienced low engagement and inadequate resources. In Buea Subdivision, a small online component may have generated value by maintaining contact, circulating reminders, sharing practice tasks or reconnecting pupils with teachers after an interruption. Such functions would not necessarily produce a large percentage of online syllabus coverage, but they could still contribute to continuity. The study therefore supports interpreting effectiveness as a relational and organisational achievement rather than as a simple measure of time spent online.

The findings should nevertheless be interpreted alongside the developmental needs of primary pupils. Recent reviews indicate that digital tools can support learning when they are purposefully selected, developmentally appropriate and mediated by adults, but that benefits vary with the type and intensity of use (Arabiat et al., 2023; Caballero-Julia et al., 2024). This is particularly important in Buea Subdivision because primary pupils may not be able to navigate platforms independently, manage passwords, interpret written instructions or sustain attention without support. The prominence of parental involvement is therefore not an optional supplement to the instructional model. It is part of the delivery mechanism. Schools should provide parents with short, comprehensible guidance and should avoid assigning tasks that assume continuous internet access, advanced literacy or independent device use.

Evidence from Egara and Mosimege (2024) further suggests that the learning value of blended instruction becomes more visible when the design includes subject-specific activities and an opportunity to compare learning outcomes. This study did not measure pupil achievement directly and therefore cannot establish whether perceived improvement translated into higher test performance. Future implementation should include simple curriculum-aligned checks in reading, numeracy and other foundational domains. Such checks could be administered on paper or orally and recorded through school-level tracking sheets. This would allow headteachers and education authorities to distinguish participation from learning and to identify pupils who require remediation after a period of disruption.

A further implication concerns the meaning of teacher training. The recent evidence does not support training that focuses only on operating an application. Teachers need practice

in selecting appropriate media for different subjects, chunking content, giving feedback through low-data channels, supporting caregiver mediation and adapting assessment when pupils have unequal access. In the context of Buea Subdivision, a practical professional-learning cycle could involve teachers jointly preparing one weekly continuity package, testing it with a small group of pupils, reviewing participation and revising the package. This approach would connect TPACK principles with the realities of crisis schooling and would make professional development more collaborative and less dependent on one-off workshops.

Recommendations

Based on the findings of this study the following recommendations are made. Firstly, infrastructure investment should prioritise reliable connectivity and power solutions for schools, recognising that electricity and network stability are prerequisites for sustained digital engagement. Secondly, access interventions should address device constraints by supporting schools and vulnerable households with appropriate devices and by promoting low-bandwidth learning resources that can function on basic smartphones. Thirdly, teacher professional development should be institutionalised focusing on designing blended lessons, managing learner participation, providing feedback, and using simple tools for assessment and record-keeping during disruptions. Fourthly, school-level guidelines should be developed to standardise expectations during crisis periods, including communication routines, content coverage priorities, and monitoring arrangements that help schools identify learners who are disengaging. Fifthly, parent and guardian engagement should be strengthened through clear communication and guidance, since primary learners depend on household support to complete learning tasks outside school.

Conclusion

Blended instructional strategies are used in primary schools in Buea Subdivision and are generally perceived by headteachers as useful for maintaining education continuity and quality during crises situations. Their implementation, however, remains predominantly face-to-face, with online teaching accounting for a relatively small share of syllabus coverage. The findings show both the promise and the limits of blended learning in a conflict-affected, resource-constrained environment.

Blended instruction will strengthen resilience only when it preserves meaningful teacher–pupil interaction and offers feasible routes for learners with different levels of access. Reliable connectivity and devices are important, but they must be accompanied by teacher competence, manageable routines, parent communication, inclusive alternatives and school-level monitoring. For primary schools in Buea Subdivision and comparable settings, the most appropriate approach is not an online-only model but a layered, low-bandwidth and pedagogically structured system that can move between classroom and remote delivery without abandoning the most vulnerable pupils.

References

Angrist, N., Bergman, P., Brewster, C., & Matsheng, M. (2022). Stemming learning loss during the pandemic: A rapid randomized trial of a low-tech intervention in Botswana. Proceedings of the National Academy of Sciences, 119(46), e2211699119. https://doi.org/10.1073/pnas.2211699119

Arabiat, D. H., Al Jabery, M. A., et al. (2023). Interactive technology use and child development: A systematic review. Child: Care, Health and Development, 49(4), 663–677. https://doi.org/10.1111/cch.13082

Bruner, J. S. (1961). The act of discovery. Harvard Educational Review, 31(1), 21–32.

Béché, E. (2020). Cameroonian responses to COVID-19 in the education sector: Exposing an inadequate education system. International Review of Education, 66(5–6), 755–775. https://doi.org/10.1007/s11159-020-09870-x

Caballero-Julia, D., Martín-Lucas, J., & Andrade-Silva, L. E. (2024). Unpacking the relationship between screen use and educational outcomes in childhood: A systematic literature review. Computers & Education, 215, 105049. https://doi.org/10.1016/j.compedu.2024.105049

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. Learning Policy Institute.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. Educational Researcher, 38(3), 181–199. https://doi.org/10.3102/0013189X08331140

Egara, F. O., & Mosimege, M. (2024). Effect of blended learning approach on secondary school learners' mathematics achievement and retention. Education and Information Technologies, 29, 19863–19888. https://doi.org/10.1007/s10639-024-12651-w

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. The Internet and Higher Education, 7(2), 95–105. https://doi.org/10.1016/j.iheduc.2004.02.001

Garrison, D. R., & Vaughan, N. D. (2008). Blended learning in higher education: Framework, principles, and guidelines. Jossey-Bass.

Graham, C. R. (2006). Blended learning systems: Definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), The handbook of blended learning: Global perspectives, local designs (pp. 3–21). Pfeiffer.

Gyamerah, K., Asamoah, D., Baidoo-Anu, D., Quainoo, E. A., Amoateng, E. Y., & Sasu, E. O. (2024). Emergency remote teaching amid global distress: How did teacher educators respond, cope, and plan for recovery? Discover Global Society, 2, Article 28. https://doi.org/10.1007/s44282-024-00053-9

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

Horn, M. B., & Staker, H. (2015). Blended: Using disruptive innovation to improve schools. Jossey-Bass.

Inter-agency Network for Education in Emergencies. (2020). Guidance note on distance education. https://inee.org/resources/inee-guidance-note-distance-education

International Crisis Group. (2017). Cameroon's Anglophone crisis at the crossroads (Africa Report No. 250). https://www.crisisgroup.org/africa/central-africa/cameroon/250-cameroons-anglophone-crisis-crossroads

Kaffenberger, M. (2021). Modelling the long-run learning impact of the COVID-19 learning shock: Actions to (more than) mitigate loss. International Journal of Educational Development, 81, 102326. https://doi.org/10.1016/j.ijedudev.2020.102326

Martin, F., Ceviker, E., & Gezer, T. (2024). From digital divide to digital equity: Systematic review of two decades of research on educational digital divide factors, dimensions, and interventions. Journal of Research on Technology in Education. Advance online publication. https://doi.org/10.1080/15391523.2024.2425442

McEwan, P. J. (2015). Improving learning in primary schools of developing countries: A meta-analysis of randomized experiments. Review of Educational Research, 85(3), 353–394. https://doi.org/10.3102/0034654314553127

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. U.S. Department of Education.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press.

Singh, V., & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988–2018). American Journal of Distance Education, 33(4), 289–306. https://doi.org/10.1080/08923647.2019.1663082

United Nations Children's Fund. (2018). Cameroon humanitarian situation report. https://www.unicef.org/cameroon/reports

United Nations Children's Fund. (2020). Cameroon humanitarian situation report. https://www.unicef.org/cameroon/reports

United Nations Children's Fund. (2021). COVID-19 and school closures: One year of education disruption. https://data.unicef.org/resources/one-year-of-covid-19-and-school-closures/

United Nations Educational, Scientific and Cultural Organization. (2020). Education in a post-COVID world: Nine ideas for public action. https://unesdoc.unesco.org/ark:/48223/pf0000373717

United Nations Office for the Coordination of Humanitarian Affairs. (2018). Cameroon: North-West and South-West situation report. https://www.unocha.org/cameroon

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.

World Bank. (2020). The COVID-19 pandemic: Shocks to education and policy responses. https://doi.org/10.1596/33696