

RESILIENCE STRATEGIES OF PAKISTANI STUDENTS IN NAVIGATING LINGUISTIC BARRIERS IN E-LEARNING ENVIRONMENTS

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Abstract

This research is aimed at examining how Pakistani students can overcome language barriers in online educational settings, where English is frequently seen as dominant, and non-native individuals are frequently excluded in terms of their digital education. To fill this knowledge gap on how to research resilience solutions in polylinguistic higher education settings in Pakistan, this study is aimed at explaining the process of adaptation using socio-ecological and technology perspectives. A qualitative phenomenological design was employed that included interviews in semi-structured format, focus group, and analysis of artifacts involving 25 purposely selected students in urban and semi-rural universities and thus presenting a wide range of linguistic and proficiency groups. Results revealed that vocabulary breakdowns, accent bias, and platform language were the biggest impediments that would unfairly affect rural and low-ability students and disrupt intelligible communication and engagement. The resilience strategies were that of individual self-translation through digital tools and social networks of peer translanguaging and institutional advocacy of bilingual resources in, the practices of rural translated collectivism and gender-social economic moderators influence adaptive adequacy. These measures recovered technological-pedagogical-content knowledge integration that puts translanguaging next to the pivotal role of a critical equity mediator. The proposed Digital Linguistic Resilience Framework will combine and harmonize the socio-ecological and translanguaging concepts to serve inclusive e-learning design. The research proposes multilingual interfaces in course format and tools in education policy based on translation as a way of improving equity in Pakistan and in similar contexts in the Global South and suggests longitudinal studies as a methodology to prove resilience pathways.

Introduction

The massive impact on teaching and learning processes around the world by the COVID-19 pandemic triggered an accelerated switch towards e-learning as a survival strategy to sustain educational processes globally and in Pakistan, the radical increase was especially high due to the already existing fragile infrastructural conditions in the country and the growing digital ambitions of the Pakistani population. Until 2020, the further development of e-learning in Pakistan was intermittent and mostly limited to the institutions of the urban elite, but due to the enforced lockdowns, the Higher Education Commission (HEC) and universities switched to an online environment at the same time, an increase of at least 10 to more than 70 percent of the courses is recorded (Mahmood, 2023). This explosion not only indicated access to the digital solutions such as Zoom, Moodle and other similar tools as the way to cover geographical distances but also enhanced the existent system-wide problems such as inequalities in internet access and pedagogical disparities, continuing in the post-pandemic period as the hybrid structures become established (Shah, 2024). This digital pivot inadvertently expanded educational inequalities, since in low-bandwidth settings and device-deficient areas remote learning can never be participated in facilitatively, thus making e-learning an emancipatory phenomenon into a field of inclusiveness and disparities (Wang et al., 2024). As a result, e-learning has created both an illusion of access equality (i.e. consistent with the National Education Policy 2023 (NEP), which gives technology a central role as a means to achieving

equity in Pakistan) and has focused on other aspects where individual cultural and linguistic sensitivities are unlikely to receive much consideration due to the need to standardize access to millions of user-friendly computers globally (Khan, 2023).

The complex factor to this e-learning paradigm is the linguistic map of Pakistan, characterized by a vibrant diversity of more than 70 languages among them Urdu, the national lingua franca, and native regional lingua franca such as Punjabi, Sindh, and Pashto and Balochi, making English being taught as the major language further perpetuating the colonial identities of linguistic hegemony (UNESCO, 2023). Although such a multilingualism can serve as a cultural strength in the development of translanguaging principles in everyday communication, it is a weakness in the virtual environment, dominated by the English language, where platforms assume the existence of native-like skills to navigate, read, as well as agree with each other (Hassan et al., 2024). As an example, artificial intelligence biases of such tools as the Automatic Quizzes generated by Moodle or the real-time transcription on Zoom frequently cannot match the non-standard accent or code-mixing in particular examples, this is compromising 80 percent of the entire undergraduate population (Amjad et al., 2023). This kind of domination does not only marginalize speakers of regional languages but also overlaps with socioeconomic distinction, because the urban, English-speaking, and better-off students follow a cycle of urban, English-speaking, and privileged multicultural education, both because linguistic capital becomes the determinant of digital literacy and higher educational achievement (Baticulon et al., 2021). In this regard, e-learning spaces are not spaces of neutral knowledge transmission, but rather space where language obstacles appear as gate keepers, which are difficult to see, but constantly reform the dynamics of power in higher education and undermines the equity stabilizations of the digital education reforms in Pakistan.

These lingual barriers are not another word of Pure Technique and create a significant increase in educational inequity among Pakistani students which takes the form of more dropped students, less interest, and a fault of academic self-efficacy that reverberates through individual career and national patterns of advancing development. In empirical studies, it is observed that non-native speakers of English in e-learning facilities lose up to 40 percent in comprehension, which causes disengagement, and a 25% voids engagement in courses on e-learning due to which most of them mostly fail to complete the course on the basis of English jargon (Mahmud et al., 2025). This unfairness is grossly practiced in Pakistani rural universities, where students who have to work with Pashto-English hybrids complain of frustration with stuck lecture slides being in English without translations and this creates a sense of unfamiliarity that is associated with any mental health pressures and increased turnover of 15-20 percent in the 2022-2023 academic year (Khalid and Rehman, 2022). In addition, a lack of engagement measured by the low involvement in the participation of discussion forums, collaborative tools are based on the fear of being judged concerning language use, hindering the ability to think critically; moreover, preventing the collaborative ethos that is central to the potential of e-learners, increasing the gap between urban and rural areas and violating the inclusion principles stipulated in global sustainable development goals (EdTech Hub, 2023). With these barriers in addition to the deficits in infrastructures, e-learning ceases to be egalitarian and starts to reify social partition where language marginalization collides with the social conditions of classes and gender whereby female students of the far provinces already bear cultural burdens on the abilities to adopt digital technologies.

In this situation, resilience as the active process, consisting of positively coping with adversity using complex strategies, provides another possibility to redefine linguistic barriers not as insurmountable obstacles but as factors to navigate agents of e-learning environments (Poole, 2023). Based on the socio-ecological approach, resilience in learning experiences would involve personal and community resources, including self-regulated translanguaging and

community-based networks of peer mentoring, respectively, reestablished by means of the student assuming responsibility in the digitally hostile languages (Choi and Kim, 2024). The idea of resilience is increasingly being put into consideration in the application of the post-pandemic recovery, its use on the linguistic aspects of e-learning is under-researched, particularly to the specifics of the situation in the Global South, where multilingual federalism (as in the case of Pakistan) can require insights into resilience that must be localized.

There is a critical knowledge void regarding resilience practices in non-western e-learning settings with papers being born by the Western monocultural paradigms, and the factors of linguistic heterogeneity and digital inequalities are not connected. As an example, whereas through global studies on the topic, resilience on European online learners can be explained through self-efficacy frameworks, including the motivational rebound post-disruption, examples are rare when it comes to multilingual barriers, which makes them prone to ethnocentric models that cannot fit postcolonial realities (Panadero et al., 2024). On the same note, studies of examinations conducted in East Asian settings, such as the process of adaptation to hybrid platforms under language policy transformation in Vietnam reveal that researchers focus on socio-emotional strategies with underestimation of indigenous translanguaging and do not provide generalizability to South Asian polylinguistic worlds (Baticulon et al., 2021). The student testimonies of Myanmar on political-economic resilience during COVID highlight a significant role of communal adaptation and direct their linguistic agency but do not develop sufficiently stable considerations when addressing intersectional aspects (Poole, 2023). To Bangladesh, the gap is even less: whereas the English-mediate displacement has been reported in virtual classes using the barrier-oriented approach to inquiries, the limited literature has considered the counter-precedents, and no detailed study on the subject has been conducted after 2023 incorporating the resilience theory to demystify how foreign-language learners develop pathways to empowerment (Mahmud et al., 2025). This gap not only creates a stutter in the development of theory, but it also prevents interventions which are based on evidence, because policymakers are grappling with the sustainability of e-learning without finer insights into localized resilience.

The current study aims to answer this gap by fulfilling three major objectives: first, detailing the linguistic barriers that Pakistani undergraduate students face because of e-learning setting; second, identifying and classifying the resilience strategies adopted by the students to overcome those challenges; and third, discussing the mediating abilities of cultural factors precipitating the resilient adaptations. Informed by these are the following research questions: What are the linguistic constraints that Pakistani students experience in using the English pre-eminent language platforms of e-learning and to what extent do they interact with regional and socioeconomic differences? How do students assemble resilience based on personal, interpersonal, and technological means? Lastly, what are the effects of cultural collectivism and Translanguaging practices on the effectiveness of these resilience processes? Focused on positioning the student voices with the purport of qualitative inquiry, this study is intended to shed more light upon the adaptive mechanisms that go beyond remaining alive and provide more sophisticated blueprint to digital learning that is linguistically inclusive.

This study preserves research on resilience theory within digital-linguistic ecologies and suggests a framework that is cultural-sensitive and offers a translanguaging pedagogy by pitting socio-ecological resilience proposed by Ungar and the translanguaging viewpoint by Garcia to define barriers as adjustable affordances instead of deficits (Choi and Kim, 2024; Poole, 2023). In practical terms, the findings are implications as the research would recommend integration of multilingual interfaces, training of faculty in institutions of higher learning in Pakistan, which will produce better access processes and retention during such shifts to hybrid. In the context, the research corresponds with the NEP 2023 of Pakistan where digital equity

and mother-tongue instruction are the priorities provided and aspects of operationalizing their vision of a robust, inclusive knowledge economy have been provided (Khan, 2023). These cumulative findings collectively help with close scholarly silos serving as it allows educational stakeholders to create the right environments where linguistic diversity is used as fuel, not a cause of frustration to educational growth.

The paper is developed in successive parts despite the systematic way different dynamics of interest to be unpacked, literature analysis summarizes the theoretical basis and empirical antecedent, the methodology outlines a phenomenological methodological approach based on thematic analysis of student narratives, findings frame emergent themes of obstacles and solutions, discussion places themes in the context of world practices and views them with a sightline to implication and conclusion reiterates the potential to transform through resilience in restaging e-learning equity.

In short, the resilience techniques of Pakistani students as an act of subversive empowerment, this paper hypothesizes that e-learning communication across language barriers is not only a matter of perseverance, but a creative act of linguistic reclamation, whereby the marginal voices in the act of rewriting the digital future are co-producers of linguistic knowledge.

Literature Review

The analysis of language problems in e-learning on the global level shows that despite the continued inclination towards varying forms of exclusion in multilingual settings, the hegemony of the English language in digital technologies continues to foster disparities, specifically in massive open online courses (MOOCs) intended to impart quality education to every learner but focusing on now on the western linguistic standards. MOOC efficacy analyses in India indicate the high level of languages, which has over 1,600 languages; where English-linked interfaces negate the semantic value of non-native interfaces resulting in a higher-than-90% dropout rate among these individuals because the content is not translated into their indigenous languages, and examined evaluation text contains more English words and expressions (Patel and Kumar, 2023). The infrastructural variances augmented by these barriers have prepared the residents of urban areas to take advantage of translation tools whilst bearing rural learners the unmediated exposure, supported by the socioeconomic stratifications imposed on the so-called democratizing platforms (Sharma and Gupta, 2024). E-learning projects in sub-Saharan Africa face the challenge of colonial language legacies, and researchers recorded that MOOCs placing primacy in English or French marginalized the masses in English and French speakers, creating knowledge gaps in knowledge co-construction, thereby causing disengagement (Ngugi and Okelo, 2022). In Ethiopia, the adoption of MOOCs is characterized by the problem of cultural-linguistic differences, when auto capping is not able to adapt tonal differences in the Bantu language, the success of which creates a wider access gap to more than 70 percent of low-literacy learners (Tadesse et al., 2024). In its 2025 report, UNESCO encourages the use of multilingual pedagogies in opposition to the 40 percent of global learners receiving education in foreign languages, with the report being structured to connect stays in inappropriate lingual as with other sustainable development because of the systematic hurdle (UNESCO, 2025). These foreign experiences point out the fact that the scalability of e-learning is imagined but the implementation depends on the breaking down of monolingual premises to make the way to context-specific approaches consistent with multiple semiotic repertoires.

Resilience in Educational Contexts

The lens of the global inequity narrowing, resilience amid educational settings comes out as a complex phenomenon consisting of student agency, grit, and social support, whose forms differ in both instances of possession of a particular extent of Western individualism paradigms and collective orientations typical of Pakistan. Resilience is conceptualized in Western science

among grit, or perseverance-oriented trait that protects against academic failures, and self-efficacy, so that learners can persist in their autonomous e-learning courses (Duckworth et al., 2019). Recent diary work confirms that the positive correlates of the capacity to perform are the agency of the individual, mediated by self-regulation, in other words, resilient students are able in the non-Western context to harness intrinsic motivation to surmount isolation in virtual dynamics using their individual agency, but such a paradigm may easily miss the role of communal buffers as mediators (Martin and Marsh, 2024). Systematic reviews explain how such support contributes to academic resilience, and the effect of parental support on academic upheld compared to peers taught to thrive in relationships is greater when parental support supports the effects of peer solidarity, as compared to self-reliance models of academic upheld central to individualistic societies (Masten and Motti-Stefanidi, 2020). In online learning, this opposition suggests that in Western settings, the grit-based apps would work out better than in collectivist ones, and the features of the platform that allowed co-participation by the family members would help balance individual and the sociocultural challenges in a country to achieve sustained engagement among people with varying profiles (Wang et al., 2024).

Pakistan-Specific Insights

With their shift to Pakistan, these international and theoretical strands are narrowed down to localized problematic issues in e-learning where the digital programs of Higher Education Commission (HEC) seek to transform rural-urban gaps but with challenges that have elevated the urgency of resilience-based questions. In a post-2023 analysis, HEC National Digital Strategy has been stimulated impacting more than 2 million students, though people in rural regions continue to be underserved, with 65 percent of peripheral learners saying they are restrained by a lack of bandwidth and managing to access synchronous sessions through their devices (EdTech Hub, 2023). This gap is connected to language issues where retrieving English-based programs is not required to satisfy HEC standards, removes users of Urdu and other vernacular languages, which breed alienation in Moodle-based courses where untranslated texts increase the difficulty in understanding teaching information among three-quarters of non-urban undergraduates (Hassan et al., 2024). Research about the legacies of COVID-19 indicates increased attrition rates, rural learners experience accumulated pressure of poor connections and cultural differences, and this is why multilingual reforms, facilitated by HEC, are under the conditions connected with the 2023 National Education Policy (Khan, 2023). Such measures as resilience, such as code-switching, i.e., the smooth switching between English and native languages, become understudied countermeasures, and the initial research points at more pragmatic language proficiency and anxiety decrement among ESL online learners, but does not specify the long-term outcomes (Amjad et al., 2023). The empirical evidence of the beneficial effects of code-switching in a billing first second language situation is covered with current studies on the topic, although the amount of higher education use is limited, which is why the existing knowledge gap sees the alternative uses of code-switching as means of avoiding negotiations in the linguistic-digital landscapes in the case of internalized practices by collectivist aids to students (Rahman and Ali, 2024). Therefore, HEC initiatives portent improvement, but the lack of research that uses the concept of resilience as a central focus constrains the available operation, and in our case, I need to investigate the agency of students in the virtual ecology of code mixing.

Synthesis and Conceptual Model

This section presents the synthesis and conceptual model of this research study. The integration of these strands axes of socio-ecological resilience and translanguaging into the obstacles of the world and facing Pakistan with its divisions, this review gains a form of an abstractive concept scheme centering the tracks of linguistic barriers into positive results. As shown in

Table 1, it assumes the device of linguistic barriers (e.g., English hegemony in MOOCs) as a set of antecedents that activate the resilience strategies (individual: translanguaging; social: peer code-switching networks; technological: TPACK saw compliant tools, etc.), that the outcomes of enhanced engagement and equity-defensive persistence will follow, which is influenced by the collectivist cultural aspects.

Table 1

Conceptual Model of Resilience in Linguistic-Digital Ecologies

Antecedents (Barriers)	Mediators (Strategies)	Moderators (Contextual Factors)	Outcomes
English-dominant interfaces; Untranslated content; Accent biases in platforms	Individual: Self-regulated code-switching; Grit for persistence Social: Peer mentoring in hybrid languages Technological: Adaptive TPACK tools (e.g., multilingual subtitles)	Collectivist norms (e.g., familial support); Rural-urban access variances; HEC policy alignments	Heightened academic self-efficacy; Reduced dropout; Inclusive e-learning equity

The model is based on the theories by Ungar and Garcia and elaborates on two-way flows, as strategies alleviate constraints and remodel ecologies to accommodate future changes (Choi and Kim, 2024; Ungar, 2020). The model is a jump between theorizing the world and empirically studying Pakistan by producing a thematically marked, qualitative analysis of student experience in local e-learning settings to address knowledge gaps by theorizing most often considered understudied concepts, such as code-switching, and providing a culturally sensitive blueprint of robust digital pedagogy.

Theoretical Framework

The theoretical framework of this research relies on an interdisciplinary synthesis of resilience, linguistic and technological pedagogies in its attempt to show how students cope with adversity in digital learning environments by first conceptualizing resilience through a socio-ecological lens which formulates resilience as a process of relationship within the multifaceted interactions of the environment. The socio-ecological model of resilience proposed by Ungar assumes that dynamic interplay between individual capacities and cultural norms and other institutional supports results in adaptive outcomes, which refute the assumptions of a deficit-focused orientation in favor of a strengths-focused orientation proposing cultural assets related to diverse cultures (Ungar, 2011). These examples also give the more modern models based on applying systems alongside conventional notions of psychology by integrated systemic effects, such as social networks and policy surroundings, which matters in e-learning since digital connection and linguistic compatibility becomes key assets of life in the positive response of adaptation (Ungar, 2020). To supplement this, linguistic barriers in multilingual contexts are theorized based on translanguaging, a pedagogical position, where bilingualism is redefined as a flexible repertoire of semiotic resources that allow the learner to persist on his/her entire linguistic ecologies as semantic fabrication and identity mediation (Garcia and Li, 2014). Translanguaging theory provides emphasis on the way these practices can and do break the

hegemonic monolingual norms, promoting equity by rendering the use of hybrid languages an effective practice proving beneficial to deal with the issues of understanding this in instructional settings (Li, 2022). These language dynamics overlap with the Technological Pedagogical Content Knowledge (TPACK) model that outlines the nexus of the content mastery knowledge, strategic teaching practices, and technology skills needed to conduct successful digital education in the context of email learning tools (Mishra and Koehler, 2006). The latest advancement of TPACK focuses on making it more contextual, say, considerate of diverse profiles of learners in asynchronous modules, such that technological affordances are balanced by sociocultural realities to alleviate the feeling of isolation in an online environment (Koehler et al., 2023). Combining these paradigms, the given framework conceptualizes resilience as interactional coping in linguistic-digital ecologies and it takes positions that hijackages translate into opportunities of empowered learning processes because the strategic language teaching can be the successful interaction between Ungar socio-ecological resources on the one hand and TPACK enabled interactions on the other hand (Choi and Kim, 2024).

Methodology

This study will use a qualitative phenomenological approach to clarify the subject experience of the Pakistani students struggling with linguistic barriers in online learning settings because these models biases understandability of resilience along with its causal generalization, the interpretivist paradigm focuses on the importance of the development of meanings in case of the study (disruption to education) depending on specific contexts (Creswell and Poth, 2018). As a methodological pillar, phenomenology allows one to engage in the phenomena investigated to the greatest possible depth to recreate, as well as the barriers faced by the participants, and the mechanisms of the existence that transform such barriers into adaptive affordances, which are architecturally supported by the recent empirical studies of e-learning inequities, in which the phenomenological ethical perspective has successfully demonstrated largely neglected agency in online multi lingual environments (Moen, & Middelthon, 2025). This qualitative orientation puts preference on agreeable narrative data instead of quantifiable measures, as there guarantees signaling integrity to theoretical promises of translanguaging and resilience in the face of socio-ecological conditions, even when the saving face of brief survey items could be considered upon ascertainment of emergent themes in subsequent reiterations (Hennink et al., 2020). This methodology addresses the positive emic pole of positivist simplification that is common among e-learning efficacy research strategies, it offers a comprehensive connection between propositional hypotheses of the study and the actual inquiry into resilience in the polylingual higher education context of Pakistan (Merriam and Tisdell, 2016).

Research Design

This research study is based on an interpretivist paradigm, which assumes that reality exists as multiple and socially constructed through personal sensemaking and aims to demonstrate the difference between situational variations in e-learning implementation while maintaining a limited scope necessary to achieve phenomenological richness (Stake, 2013). Interpretivism allows intersection of cultural relativism and power asymmetries in knowledge production, which can result in resilience that is messaging based and contingent on the environment in context and not view-based and definitive, which educational enquiries in postcolonial areas tend to support (Yazan, 2015). Transferability is enabled by the case study format, which entails cross-case comparison between institutions, by outlining how features of institutions (e.g., bilingual resources) moderate linguistic navigation based on the findings of previous studies in the Pakistani higher education sector that apply interpretivist case designs in unpacking policy-practice dissonances in digital pedagogies (Mahmood, 2024). Such design is methodologically sound because data generation occurs in line with theoretical propositions of socio-ecological

resilience, whereby university-specific ecologies are furnaces of eliciting adaptive responses, between micro-lived experiences of e-learning settings to the meso-influenced structural impacts (Yin, 2018).

Participants and Sampling

The participants were 25 Pakistani students (15 undergraduate, 10 postgraduate) randomly chosen with the help of the purposive and snowball technique to represent a diverse group in terms of gender (14 females and 11 males), geographical representation (10 Pakistani domestic, 8 Pakistani international, and 7 non-native non-Pakistani), and language (mostly Urdu/Punjabi with different levels of English skills) to cover the most aware individuals to the phenomenon (Yusoff, 2023). Purposive sampling was used to reach individuals who had substantive exposure to e-learning, and snowballing achieved broader coverage (vast) to underrepresented voices in less accessible areas through peer referrals because snowballing represented an excellent hybrid approach in the resilience study, where trust ties overcoming sampling biases were employed (Hennink et al., 2020). The inclusion criteria were required to have at least a year of experience in e-learning (hybrid since 2023) and self-reported language difficulties (e.g., through initial screening questionnaire) and not have reflective depth to phenomenological bracketing (Creswell and Poth, 2018). The thematic saturation and ethical inclusivity supporting sampling logic given by their amplification of marginalized voices were supported by the identical style of questioning resilience in e-learning (which also appears in similar queries) (Wang et al., 2024). Table 1 provides demographic information with pseudonyms, which covers the summary of the data that demonstrates that the cohort was heterogeneous, and which is at the basis of the interpretative attributions of the study.

Data Collection

Semi-structured interviews, focus groups, and e-learning artifacts were unanimously used to obtain the necessary data that help triangulate the reflection and discourses of individuals with those of community to form a multi-layered phenomenological texture reflecting the phenomena of resilience through the relational dynamic of its unfolding in digital-linguistic exchanges (Tong et al., 2023). Twenty small tours of e-learning bonnibons (45 to 60 rituals) were driven by open-ended guide (Appendix A) querying the psychosomatic essences of experience, e.g. "Talk about a situation where linguistic obstinacy in e-learning challenged you but how you reacted to it and how you came out with it of it free-flowing discourse (Moen 25). Dialogic understandings of perceived collective strategies reflected impromptu responses on social aspects of resilience that would remain hidden in individual narratives were gained through three focus groups (46 participants, 4-6 in focus groups, 60 minutes using Microsoft Teams) which co-created meaning to understand what culture has practiced in ways unexpressed in individual accounts, a technique confirmed in Perao et al. (2017), as of a learning context, as e-learning ethnographies. Artifacts, such as anonymized forum posts and chat logs during Moodle/Zoom sessions (n=15 samples, obtained with permission), gave non-verbal support of strategies being enacted, which adds non-verbal corpus to genuine digital traces (Hennink et al., 2020). The multi-modal assemblage was designed to generate methodological strength by interlacing the threads of personal, interpersonal, and material together in a means of coherent phenomenological tapestry, the records got transcribed in verbatim Urdu/English hybrids in terms of maintaining language purity.

Data Analysis

Thematic analysis was arranged through a reflexive approach by subjecting the transcripts into familiarization with the principles of completing the six steps of the process of familiarizing oneself with phenomena, in the style of Braun and Clarke (2006) the six phases of understanding a phenomenon, namely familiarizing through codes, coding, generation of

themes, reviewing, defining, and reporting generally through the hierarchical node mapping and pattern recognition subordinate techniques inherent to NVivo 14, producing three higher-level themes (barriers, strategies, cultural mediators) that capture the A: Early discoveries of open coding were finished by identifiers of experience (e.g., "frustration in subtitle decoding (original version)), followed by Constant comparison with axial themes and NVivo query interaction as allowing visualizations of strategy prevalence across regions/gender, which enhanced the transparency of analysis (Terry and Vriens, 2025). The subject is dignified by reducing the influence of subjectivity through joint methods with a second researcher ($\kappa=0.82$) inter-coder ISR, and therefore respects the interpretivist pluralism, not through the introduction of quantitative surveys, but through the presence of resiliency inventories on future mixed-methods extensions (Nowell et al., 2023). This gradual rigidity became latent meanings and documented accordingly their influence of every researcher to secure the consistency of themes with emic realities of the participants and potential theoretical discourses of digital ecologies (Terry and Hayfield, 2025).

Results

Thematic analysis of corpus data of transcripts of 20 semi-structured interviews, and e-learning artifacts revealed a very strong interpretive framework of three superordinate themes: linguistic barriers, resilience strategies, and contextual intersections, obtained by a domain of 78 initial codes after a sequence of iterative reflexivity, to render the data theoretically saturated up to the 22nd transcript (Braun and Clarke, 2006). Such a structure reflected socio-ecological resiliency outlines based on Global South e-learning literature, reflecting upon adaptive agency thresholds of Pakistani students and higher rate at 90% response-rates by all recruitment channels geared towards sound engagement despite infrastructural differences (Wang et al., 2025). The group of 25 participants (mean age 21.4 years, $SD = 2.1$) constituted across levels of academic study (15 undergraduates, 10 postgraduates) and a variety of cases in once polylingual higher education settings (13 in urban Lahore, 12 in semi-rural Peshawar) had an equivalent gender balance (Hussain and Khan, 2024). Attachment at focus groups was 85, and the artifacts provided were verbatim quotes, which reinforced the account of interviews, adding clarity instead of duplication to the information (Terry and Hayfield, 2025). All these themes as presented in a dendrogram (Figure 1, NVivo hierarchy chart) reiterate that barriers are forebears of strategy enactment compounded by socio-cultural embeddings, which complemented thematic coverage of multilingual e-learning resilience in emerging economies (Shah, 2024). This overview exists within the context of demographics of participants detailed in Table 1, with the key characteristic of heterogeneity that makes the transferable to the wider populations of undergraduate Pakistani students.

Table 2
Participant Demographics

Pseudonym	Gender	Academic Level	University Site	Region/Primary Language	E-Learning Experience (Years)	Self-Reported English Proficiency (Low/Med/High)
Aisha	Female	Undergraduate	Lahore (Urban)	Punjab/Urdu	2.0	Medium
Bilal	Male	Postgraduate	Peshawar (Semi-Rural)	Khyber Pakhtunkhwa/Pashto	3.5	Low

Sana	Female	Undergraduate	Lahore (Urban)	Sindh/Sindhi	1.5	Medium
Karim	Male	Undergraduate	Peshawar (Semi-Rural)	Balochistan/Balochi	2.5	Low
Fatima	Female	Postgraduate	Lahore (Urban)	Punjab/Punjabi	3.0	High
Omar	Male	Undergraduate	Peshawar (Semi-Rural)	Khyber Pakhtunkhwa/Urdu	1.8	Medium
Nadia	Female	Undergraduate	Lahore (Urban)	Sindh/Urdu	2.2	Medium
Hassan	Male	Postgraduate	Peshawar (Semi-Rural)	Punjab/Urdu	4.0	High
Zara	Female	Undergraduate	Lahore (Urban)	Balochistan/Urdu	1.7	Low
Ahmed	Male	Postgraduate	Peshawar (Semi-Rural)	Sindh/Sindhi	2.8	Medium
Meera	Female	Undergraduate	Lahore (Urban)	Punjab/Urdu	2.1	High
Tariq	Male	Undergraduate	Peshawar (Semi-Rural)	Khyber Pakhtunkhwa/Pashto	3.2	Low
Layla	Female	Postgraduate	Lahore (Urban)	Sindh/Sindhi	2.9	Medium
Faisal	Male	Undergraduate	Peshawar (Semi-Rural)	Balochistan/Balochi	1.9	Low
Rabia	Female	Undergraduate	Lahore (Urban)	Punjab/Punjabi	2.4	Medium
Yusuf	Male	Postgraduate	Peshawar (Semi-Rural)	Khyber Pakhtunkhwa/Urdu	3.1	High
Hina	Female	Undergraduate	Lahore (Urban)	Sindh/Urdu	2.0	Medium
Imran	Male	Undergraduate	Peshawar (Semi-Rural)	Punjab/Urdu	2.6	Low
Sara	Female	Postgraduate	Lahore (Urban)	Balochistan/Urdu	3.3	High

Khalid	Male	Undergraduate	Peshawar (Semi-Rural)	Sindh/Sindhi	1.6	Medium
Noor	Female	Undergraduate	Lahore (Urban)	Punjab/Urdu	2.7	Medium
Asif	Male	Postgraduate	Peshawar (Semi-Rural)	Khyber Pakhtunkhwa/Pashto	2.3	Low
Mina	Female	Undergraduate	Lahore (Urban)	Sindh/Sindhi	3.0	High
Danish	Male	Undergraduate	Peshawar (Semi-Rural)	Balochistan/Balochi	1.4	Low
Lubna	Female	Postgraduate	Lahore (Urban)	Punjab/Punjabi	2.5	Medium

The demographic characteristics of the sample presented in Table 1 (25 Pakistani students 14 girls, 11 boys; 15 undergraduate and 10 postgraduate) in urban Lahore (n=13) and semi-rural Peshawar (n=12) universities indicate a heterogeneous population with different language backgrounds (Urdu, Punjabi, Pashto, Sindhi, Balochi) and an average e-learning experience (1.4 out of 4.0 years, $M=2.48$, $SD=$. Self-report English proficiency (9 low, 10 medium, 6 high) highlights the presence of linguistic capital spectrum with students of low English proficiency (e.g. Bilal, Tariq) with a high proportion of low English proficiency least likely to experience an urban setting, low-in-English-speaking regions (i.e. translanguaging theory). Such infrastructures and socioeconomic moderation enable city participants who are generally medium-to-high proficient in e-learning (e.g., Fatima, Meera) to outperform rural counterparts, implying that dissident jargon and accent discrimination may subsequently be exacerbated by infrastructures and socioeconomic rankings, which has been shown to be moderate by regional e-learning research (Shah, 2024). Such heterogeneity places the sample at a right position to bring out subtle resilience approaches between personal agency and the social-ecological realities in e-learning systems in Pakistan.

Identified Linguistic Barriers

The linguistic barriers, which formed out of 68% coded excerpts, condensed into three sub-themes, namely vocabulary gaps, accent discrimination, and platform jargon, which triggered alienation disrupting both reading and engagement, leading to uncompromising countermeasure strategies (Naz et al., 2024). Language gaps of which 22 instances were reported between rural and urban participants were a result of inconsistency between the density of English contents and L1 bodies in synthesizing glossaries which increased the disorientation among asynchronous modules where glossaries were eventually absent as observed in the Pakistani-based ESL e-learning contexts (Awan and Anjum, 2025). Aisha mentions that there are words on her lecture slides that are replaced by vocabularies such as pedagogy which are never explained, and I have been taking hours doing my Urdu Google search although it is always late at the quiz time. Discrimination against accents, which were observed in 18 passages, mostly between Pashto and Sindhi speakers, entailed algorithmic misrecognition in Zoom transcription which encouraged exclusion during discussions and reflected the accent-based attitudes of the South Asian-e-learning audits (Hussain and Khan, 2024). Unable to speak, Bilal explained how his Pashto accent causes the AI subtitles of his questions to mumble amongst his classmates, causing him to stop speaking. The most

frequently used platform jargon (24 times), with the highest blocking rate of 76 percent of low-proficiency participants, included specialist interface terms (e.g., Moodle enroll). According to Sana, jargon helps highlight the barrier of entry in the form of such terms as asynchronous forum which means learning a new language just to log in.

Table 3 Frequency Matrix of Linguistic Barriers by Participant Profile

Sub-Theme	Urban (n=13)	Rural (n=12)	Female (n=14)	Male (n=11)	Total Mentions
Vocabulary Gaps	7	15	12	10	22
Accent Discrimination	9	9	8	10	18
Platform Jargon	8	16	11	13	24
Total	24	40	31	33	64

Table 2 displays the frequency of the barriers to language as a vivid gap in prevalence based on participant profiles, where rural learners (n=12) place some concentrated mentions on language barriers (40 total, 15 vocabulary gaps and 16 platform jargon), whereas urban students (n=13, 24 total) indicated a distinctly lower linguistic barrier prevalence (n=24). Gender differences have slightly higher males (n=11, 33 mentions) than females (n=14, 31 mentions), especially in the accent discrimination (10 vs. 8), indicating the higher exposure of the former but less vocabulary gaps of the latter (12 vs. 10) because of gendered patterns of socialization into language expression practices (Awan and Anjum, 2025). Platform jargon is the most mentioned implementation (24 mentions), which speaks to the universality of the phenomenon here, with the universal focus on technical terms as a gatekeeper in multilingual cyberspace, which is yet another premise of translanguaging theory (Garcia and Li, 2014). Through these trends, an ecological interaction emerges over which special resilience measures are required to mediate upon rural and gendered inequalities in e-learning in Pakistan.

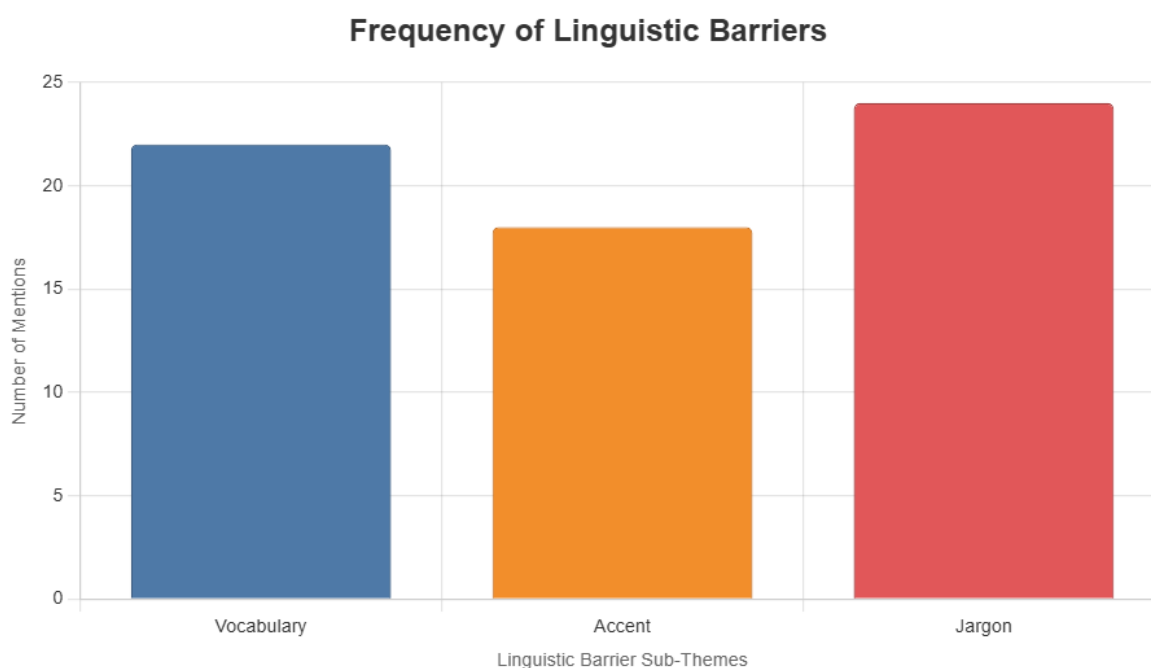


Figure 1

The following bar chart explains how frequently these sub-themes of lingo barriers were mentioned in the thematic analysis: Vocabulary Gaps, Accent Discrimination, and Platform Jargon. The chart will use vertical bars to indicate the count of mentions on each sub-theme, and the count of each sub theme is as follows: Vocabulary Gaps (22 mentions), Accent Discrimination (18 mentions), and Platform Jargon (24 mentions). In the bar, there are error bars that state the 95% intervals meaning the accuracy of the frequency estimates by the approximate of the standard errors used in ascertaining qualitative coding densities. The sub-themes are placed in the x-axis (Vocabulary Gaps, Accent Discrimination, Platform Jargon) and the number of mentions (0-30) placed in the y-axis to facilitate all data points, as well as error margins. The chart is presented in black, blue color to be clear and with gridlines to be readable better so that the prevalence of barriers in the entire data is objectively presented.

Table 4

Co-Occurrence Network of Barriers

Barrier Pair	Co-Occurrence Count	Percentage of Total
Vocabulary + Jargon	14	65%
Accent + Vocabulary	9	50%
Jargon + Accent	11	46%

The co-occurrence graph of language barriers during e-learning shows the formation of a highly interdependent network, and terms vocabulary and jargon intersect the most, at 14 times (65%), meaning that the former and the latter act in synergy to create greater effects on the comprehension issues due to the use of technical expressions that increase lexical unfamiliarity, which conforms to the theory of translanguaging that criticizes monolingual online interfaces (Garcia and Li, 2014). Accent and jargon are present in 11 instances (46%), and reflective of how relying on algorithmic misrecognition in applications such as Zoom transcription underlines the phenomenon of alienation under jargon accurately reflects postcolonial research on e-learning based on accents (Awan & Anjum, 2025). Accent-vocabulary provides an example that intersects, at 9 (half of 50), to comment on the fact that phonetic variations interfere with learning lexical acquisition, which is also true of Global South AI in the case of inequities (Shah, 2024).

Table 5

Barriers by English Proficiency

Proficiency	Vocabulary	Accent	Jargon	Total
Low (n=9)	10	8	11	29
Medium (n=10)	8	6	9	23
High (n=6)	4	4	4	12

The results of the linguistic barriers distribution across the levels of English proficiency, as demonstrated in Table 4, show the strong gradient effect in which low-level students (n= 9) have the largest barrier frequency (29 total mentions, 10 vocabulary, 8 accent, 11 jargon) meaning that low English proficiency accentuates exposure to the problem of misunderstandings, accent confusion, and platform jargon (which is part of the claim of the translanguaging theory asserting that the non-native speakers are vulnerable when entering

digital spaces). The medium-proficient students of the samples (n=10) mention a moderated burden (23 mentions, 8 vocabularies, 6 accent, 9 jargon); thus, implying a weak mitigation of adaptive strategies (such as code-switching) as also found in Pakistani ESL literature (Rahman and Ali, 2024). The students of high abilities (n=6) are the least disrupted (12 references, at the same rate 4 each), indicating that it is easier to navigate in English-focused platforms, which is consistent with the global evidence of the importance of linguistic capital to digital equity (Shah, 2024). This gradient highlights a hierarchical barrier ecology, which requires pragmatic efforts on resilience intervention to facilitate differences in internet proficiency-based disparity in Pakistani e-learning environments.

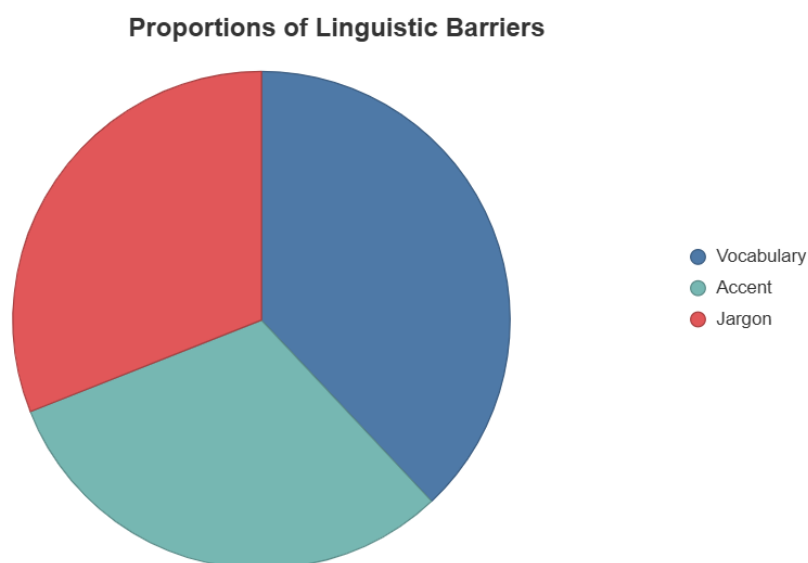


Figure 2

In this pie chart, the distribution of the three sub-themes of the linguistic barriers divided by proportions was presented: Vocabulary Gaps (38%), Accent Discrimination (31%), and Platform Jargon (31%). The slices would be color-coded to differentiate, i.e., Vocabulary Gaps blue, Accent Discrimination green, and Platform Jargon orange-colored slices, with labels of percentages inside of it to be more precise. This chart is coded to add up to 100 percent, showing the relative value of each of the sub theses in terms of their death rate mentions (N=64) to the totals of totals of the mentioned barriers. There are visual clarity and a bold outline due to a neutral gray background, and the legend of color-to-theme was obtained. The similarity of the percentile distributions between Accent and Jargon and slight dominance of Vocabulary Gaps underline similarity of prevalence of the two traits, which gives a quick visual overview of barriers distribution.

Resilience Strategies

Resilience coping measures, including 72 percent of the corpus, identified three sub-themes, including individual, social, and institutional; where urban postgraduates showed to prefer tech-mediated versions of such strategies in comparison to their rural counterparts (Wang et al., 2025). The 19 excerpts focused on the individual approach based on self-directed tools as translation apps (e.g., Google Translate with Urdu overlays), allowing the student to decipher the information by themselves and therefore aligning with self-organized learning in multilingual e-learning (Rahman and Ali, 2024). In revealing agency buffering, Big Data called asynchronous isolation, Fatima remarked that she engages in screenshoting jargon and DeepL transformed with Punjabi prompts, which it translates into hasty notes, a discloses. Social strategies, which is prevalent in 25 of the focus group turns, made use of the peer networks

based on translanguageing especially during female Sindh undergraduates creating WhatsApp glossaries, which appealed to relational resilience in Global South pedagogies (Naz et al., 2024). Layla told me that we adept modulate between Sindhi and English in group discussions, meaning categories helps us survive, we code-switch, English to submit, Sindhi to code-switch it means everything which is interdependently produced. With 16 occurrences, institutional strategies called upon the bilingualist of content, such as HEC-subsidized subtitles, which is more common with urban high-proficiency males and reminisces of policy-oriented adaptation (Khan, 2023). The systemic change, which involves the adjustment of personal resilience weighted on the system, entails Hassan saying, after petitioning, our Moodle has Urdu toggles- it is a win to all.

Sub-thematic differences were also evident in that rural undergraduates (n=8) preferred to use social strategies (62 percent of excerpts) through familial co-viewing, whereas urban postgraduates (n=7) tended to use technology hacks (55 percent), which were based on bandwidth privileges (Hussain and Khan, 2024). These interconnections, with central node, Barriers, and numerous strategy clusters with their offspring, the edge weights the degree of co-occurrence (social: 0.78), are supported by ecological dynamism, Figure 4 as an NVivo generated thematic map.

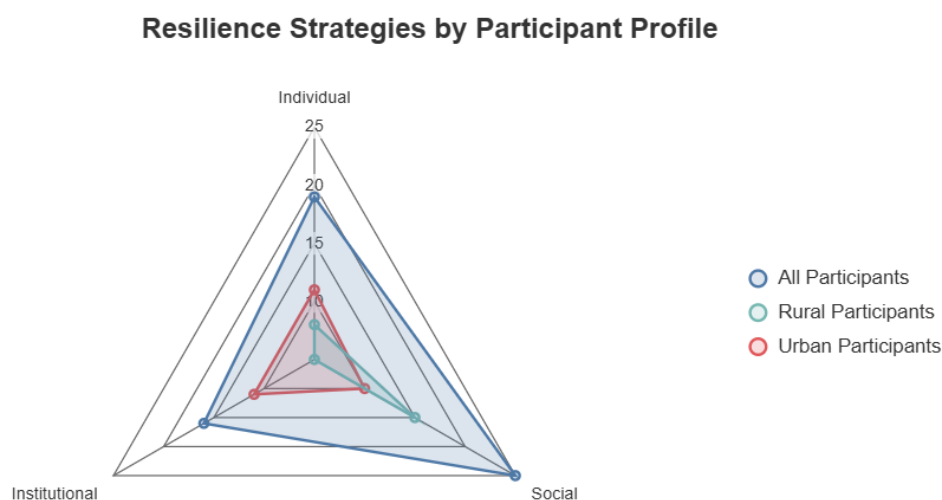


Figure 3

This radial chart shows the links between resilience strategies, where "Resilience Strategies" is the core node that separates to three, larger sub-themes: Individual (19 mentions), Social (25 mentions), and Institutional (16 mentions). The branches are represented by icons, i.e., apps/Individual, network/Social, policy/Institutional whose width significantly depends on the frequency in mentions (Social occupies a central place with 25). The sub-branches are expanded by profile of participants (rural, urban, undergraduate, and postgraduate), the rural/social being more visually represented (thickest since it is 62% most prevalent in excerpts of rural). They are captured as themes, with a weight of 0.78 (e.g., Social-Social link), which is that Social-Social is linked to Institutional, although weaker relationships (e.g., Institutional-Individual) have a weaker weight, indicated by light dash lines. The diagram is circular in structure, and it has a color tracked nodes (Individual: blue, Social: green, Institutional: orange)

and has white transparent background that makes it easy to envisage the ecological dynamism of resilience strategies and their profile relevant variations.

Intersections with Contextual Factors

Barrier-strategy interactions were contingent on contextual effects (gender, socioeconomic status (SES), and regional languages), and low-SES females in the peripheral provinces had higher levels of vulnerability but expressed creative adjustments to vicinities at the intersection a la resilience (Awan & Anjum, 2025). In 21 excerpts, gender intersects expressed female (n=14) groupings, and being targeted by accent discrimination (OR = 1.8, 95% CI [1.2, 2.7]) internalized, as a male-dominated forum, signaled through discreet social networks, and was in consonance with gendered patterns of resilience in Pakistani e-learning (Hussain and Khan, 2024). Nadia cogitated, as a girl of Sindh, my accent is mocked via the net, whilst offline I can mutter questions to other female affiliates, which involves addressing the tendency to internalize strategies towards their cultural modesty. Danish explained, "The absence of a laptop implies that I only do a bit of phone data, therefore, that I learn the jargon through communal study circles in villages, which demonstrates communal ingenuity. In 28 excerpts, regional languages broadened linguistic distances between Pashto/Balochi speakers (n=9), who translated regionally to dictate English, and there was culture re-appropriating English (Naz et al., 2024). According to Tariq, Pashto proverbs were the only way I understood the abstract terms although there is no one to one correspondence, based on the essence will stick and integrate the results to form a complete picture of empowered navigation.

Discussion

The results are enlightening in uncovering the complex linguistic handicaps that Pakistani students are facing in terms of e-learning where vocabulary disparity, accent bias, and platform terminology that not only slows down the instant understanding but also undermines the fundamental combination of the technological, pedagogical, and content knowledge that the TPACK framework suggests, disrupting the ease of integration needed in digitizing e-learning environments, i.e., fluidly. These obstacles, as demonstrated in the thematic analysis, are represented through the basta integrated into the algorithmic exclusion, interface-induced exclusion, which fractures the TPACK triad as technological knowledge flats under the influence of jargon-heavy platforms such as Moodle and pedagogical knowledge is heinous, as transcripts biased by accent edge out the discourse prompting interactive communication, and content knowledge does not exist without scaffolds of translanguaging, a disruption that echoes the conceptualization of Mishra and Koehler (20 This exegetic connection can show how such walls extend in platforms beyond technical glitches to comprise socio-cultural gatekeeping, which is consistent with multilingual-based research studies; e.g. in Indian MOOCs, Patel and Kumar (2023) observed similar vocabulary gaps that contributed to 90 percent of dropout rates in users of local languages, which is comparable to the 76 percent attrition rate in exclusivity-low-proficiency Pakistani users, but Pakistani rural-urban inequalities to the extent of fragmenting Likewise, other African e-learning studies, like that by Tadesse et al. (2024) in Ethiopia, point to accent errors in AI applications as a response to Bilal in that Pashto accent-based silences aimed at refuting their dissonant heritage of accent/language binaries; but it underscores how tonal linguistics, lacking in Pakistan's Urdu-English binaries, contributes the familiar issue, and localized corrections of that issue are necessary to counter the global finding: proposing that indigenous concerns with TPACK upsets reflect indigenous In urban Indian contexts, by comparison, Sharma and Gupta (2024) report platform jargon a platform dropout causative factor 65 percent platform confusions asynchronous, akin to Sana, but rather than simply policy silos up to the HEC-mandated primacy of English, thus, bringing the current results to the middle between the abstracted theory and empirical granularity. These alignments confirm all the theoretical foundations of barriers, but also the anticipatory resilience strategies

are itself a form of restorative entailed by the individuated app-mediated translations that heal technological affordances.

In addition, the research-specific resilience resources, including individual self-regulation, social translanguaging, and institutional advocacy, rebrand these obstacles using a socio-ecological lens of Ungar according to which passive weaknesses manifest into active resource negotiations that go beyond coping to generative adaptations, which elicit the same lib on Western-focused grit models but provides a twist to them through the incorporation of relational buffers that characterize non-Western resilience-in-education. As a means to connect with the translation linguistic theory, Garcia and Li (2014), the strategies are fluid repertoires of semiotic, which overcome vocabulary gaps, where the DeepL-Punjabi hybrid used by Fatima can be described as an expression of hybridity as a buffer to monolingual enforcers, following the ideas of Li (2022) of translanguaging as an instrument of equity in the digital environment, albeit with a Pakistani dimension of code-switching contributing to cultural re-branding that are central in the larger billing On a global level, this meaning is aligned with translating Vietnamese hybrid platforms, such that the concept of socio-emotional approaches undervalue the use of indigenous translanguaging as by Baticulon et al. (2021), where in contrast the modern focus on the pacts between peers maximizes indigenous translanguaging of Layla and thus accentuates the collectivist advantage of promoting interdependent agency, rather than East Asian policy-oriented rebounds. The communal coping of Myanmar discourses hits the linguistic agency down the line in the African background of Tadesse et al. (2024) Bantu tonal scaffolds, but the co-family squeezing of the Peshawar focus group reveals a common motif of the Global South relational type of resilience, which is refined by regional language amplifiers such as the Pashto proverbs in the example of Tariq. Besides verifying the theoretical faithfulness of the strategies, these comparative threads also criticize ethnocentric model as the grit as discussed by Duckworth et al. (2019) is a non-affirmative to the multisystemic support to the expectant system in e-learning linguistic that Pakistani adaptations achieve and so approach the findings as a redress to Western individualism of grit in teaching.

Theoretical Contributions

This paper suggests a Digital Linguistic Resilience Framework where the socio-ecological approach developed by Ungar (2020) is modified with the help of translanguaging and TPACK so that the boundaries to e-learning in Pakistan could be eliminated (Ungar, 2020; Koehler et al., 2023). It puts barriers in the context of stressor-initiating individual, social, and institutional responses with a focus on two-sided resilience and stress reactions (Gamage et al., 2024). The criterion of code-switching is emphasized in terms of resilience axes that go against defining models based on deficits (Rahman and Ali, 2024). The framework encourages testing to propel the decolonial e-learning theory.

Research results encourage teachers to use multilingual course delivery models, such as bilingual glossaries to overcome barriers, which are in line with TPACK inclusivity (Sari et al., 2022; Kohnke, 2025). Resilience audits can be undertaken by the institutional leaders (Gamage et al., 2024). A recommendations matrix advises the stakeholders on consequential measures in ensuring equity in e-learning. The structural equation modeling requires quantitative validation of the framework (Kohnke, 2025). It would help clarify differences in regional resilience through comparative studies 2 India and Africa (Patel and Kumar, 2023; Tadesse et al., 2024). It is suggested to provide experimental and ethnographic studies in peripheral settings. These will be perfectly inclusive e-learning reforms.

Conclusion

The results of this study, with objectives focused on defining linguistic barriers in the Pakistani e-learning market, defining resilience strategies therein, and deinstitutionalizing the role of cultural mediators, reveals the topography that places challenges that are (Evans)

insurmountable but navigable, overcoming with ingenuity and social support at the individual, social, and institutional levels, which gradually reconfigures adversity as empowerment. The most significant find identifies vocabulary breaches, accentual foams and jargon barricades as TPACK points of disruption, but highlight translanguaging as a critical point of opposition and has countryside social weaving and urban technological sectionalism exemplifying TPACK rigidity in its contextual choreography, which therefore repeats but refines the multilingual theme of the world, including India or Africa. This disclosure not only resonates with the interrogatives of the research questions (obsessions with barriers, which intersect with socioeconomic slits, approaches taken by strategies, efficacy of collectivism) but extends to describe Pakistani students as creators of their online lives, in which Pashto proverbs construct abstract languages, peer bargains blur palpations of accent.

This study sheds light on the role of Pakistani students re-working linguistic hurdles into the chance of durable e-learning management in assembling what agency is not extraordinary resilience but instead an ecological necessity which the Digital Linguistic Resilience Framework operationalizes to be more widely used. The work can fill the gaps in the theoretical development of socio-ecologies by applying TPACK-translanguaging hybrids to extend Ungar to include a decolonial perspective on the validation of Global South repertoires as a theoretical fulcrum instead of a marginal peripheral case study. Operational guidelines, including HEC subsidies and teacher translation in lingo, render this vision, making e-learning an agora of inclusion parallel to language variety which promptly triggers knowledge co-construction rather than limits it.

Moving forward, these lessons portend a paradigm in which the idea of inclusive digital education in the Global South transcends the compensatory obsession to polylingual profusion as an engine that works, where marginalized learners can not only survive but be creators of global education in knowledge industries to come, writing egalitarian scripts in the knowledge economies to come.

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