

Technology-Influenced Code-Switching in L1 Instruction: Urdu Teachers' Use of L2 in Teaching Urdu to Digitally Exposed Learners

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Abstract

In multilingual societies, like Pakistan, the increasing integration of digital technologies into children's daily lives has transformed language exposure patterns. multilingual. In this qualitative study the phenomenon of technology-influenced code-switching in Urdu-medium primary school classrooms has been investigated, with special focus on use of English (L2) during Urdu (L1) teaching. Though L1 teaching has conventionally been directed by monolingual pedagogical assumptions, however, digitally exposed learners have been exposed to English vocabulary, expressions and multimodal content through smartphones, social media platforms and online games. Hence, reassessment of language practices within L1 classroom teaching is need of the time due to evolving linguistic environment. In this study qualitative research design was used to explore the responses of teachers to this emerging linguistic shift. Semi-structured interviews from n=14 primary teachers (n=7 from public-sector and n=7 from private-sector schools) were conducted for data collection. Braun and Clarke's (2006) thematic analysis approach was employed for data analysis. Four interconnected themes were revealed from the findings of this study, that includes, first of all learners' digitally mediated familiarity with English language expressions, secondly teachers' use of code-switching to facilitate comprehension and engagement. Thirdly, the emergence of translanguaging practices and learners' multilingual linguistic resources and lastly tensions between policy-driven monolingual language ideologies and the multilingual realities of contemporary classrooms. This study reveals that L1 classrooms are increasingly evolving into hybrid linguistic spaces shaped by informal digital exposure rather than formal language policy or curriculum design. Hence, English is no longer restricted to second-language instruction but is increasingly functioning as a pedagogical tool within (L1) Urdu language teaching. Moreover, this study contributes to understand technology-mediated language practices which are reshaping classroom discourse and challenging monolingual L1 instructions.

Keywords: Pedagogy, Code Switching, Digitally Exposed Learners, Language and Technology.

Introduction

Language teaching and learning in multilingual societies are dynamic processes that are affected by sociocultural, technological and educational changes. The multiplicity of languages, the fluidity

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of language practices and the changing forms of communication in present-day L1 classrooms challenge the traditional assumption that instruction should be monolingual. In these contexts, the boundaries between first language (L1) and second language (L2) use have become more penetrable, resulting in pedagogical practices such as code-switching and translanguaging that allow teachers and learners to draw on multiple linguistic resources in an effort to facilitate meaning-making and learning (García & Wei, 2014).

Pakistan is a highly multilingual context, with several regional languages besides Urdu and English. Urdu is the national language. It is an important medium of instruction in many public and private schools but English remains important socially, educationally and economically. Consequently, the language education in Pakistan has been traditionally organized in a bilingual framework with Urdu and English taught as separate subjects, typically based on the monolingual teaching assumptions. The teaching of Urdu language in Urdu medium primary schools has traditionally been Urdu dominant or exclusive, while English has been restricted to English language classes. There is growing evidence that teachers use code-switching in deliberate ways to enhance comprehension, explain concepts, control classroom interaction and engage learners. In the setting of Pakistan, Mirjat and John (2024) found that code-switching was perceived by teachers and students as an effective pedagogical strategy that improved comprehension, engagement, and interaction in business communication classrooms. The results of the study showed that the strategic alternation of languages can be a pedagogical resource and not a deficiency of linguistic competence. Such findings contribute to an increasing body of research that recognizes code-switching as a legitimate pedagogical practice in multilingual educational environments, rather than as a deviation from target-language norms.

Meanwhile, rapid technological advances have added new dimensions to language exposure and acquisition. Today's primary school students live in digitally mediated environments in which interaction with smartphones, tablets, social media platforms and artificial intelligence tools are part of everyday routine. Unlike previous generations these learners are not exposed to English only through formal schooling but also by constant exposure to digital technologies that operate mainly through English-language interfaces. Thus, learners gain a considerable degree of familiarity with English lexical units, commands and expressions through incidental exposure rather than through targeted language instruction. The increasing presence of English vocabulary acquired digitally creates new pedagogical realities for Urdu language teachers. Traditional monolingual approaches may not take fully into account the linguistic repertoires that learners bring to the classroom. Teachers often find themselves in instructional situations where deliberate use of English terminology can enable explanation, linkage between classroom content to students' digital experiences and make instruction more efficient. These emerging practices point towards the possibility of L1 classrooms are becoming hybrid linguistic spaces.

The international literature widely discusses code-switching and translanguaging in L2 context but there is little research on the impact of digital exposure on code-switching practices in L1 teaching in primary education. Similarly, the current studies in Pakistan focus on bilingual education, English language instruction, or code-switching in higher education, however, little research has been conducted on how Urdu teachers in Urdu-medium primary schools perceive and react to

learners' digital engagement with English, and how this engagement affects L1 classroom language practices. In this context, this study investigates the perceptions of Urdu teachers about the English learned by learners through digital means and how this exposure affects their choice of language of instruction in the teaching of Urdu language (L1). The study uses qualitative data collected from fourteen Urdu teachers working in two public-sector and two private-sector Urdu-medium schools. The study contributes to contemporary discussions on language practices in technologically mediated educational environments and provides insights for language policy, teacher education and L1 instructional design in Pakistan.

Literature Review

Code switching is defined as the alternation of two or more languages in communicative event. Early sociolinguistic work viewed it as a strategic communicative practice, not a marker of linguistic deficiency. Gumperz (1982) defined code-switching as a contextualization cue that helps to negotiate meaning and emphasis while Auer (1998) argued that language alternation is guided by systematic communicative patterns. The use of code-switching as a pedagogical resource in educational environments is increasingly being recognized. It helps teachers to explain difficult concepts, to clarify instructions, to manage the interaction in the classroom, to reduce cognitive load and to increase learner participation (Macaro, 2005). In Pakistan, Mirjat and John (2024) found that in business communication classrooms, code-switching was perceived as a helpful instructional instrument by teachers and students, resulting in better understanding, participation, and communication. These findings lend support to the position that code-switching is a valuable pedagogical resource in multilingual educational contexts.

Many postcolonial societies have pursued policies that have favored monolingual instruction. Pakistan is a multilingual country but there is a tendency of language separation through educational practices especially in Urdu medium schools where the only use of Urdu as the medium of instruction is expected. Shamim (2011) reported that teachers in Pakistan often use a mixture of languages to facilitate learning and Rahman (2002) argued that the language practices in educational institutions are a reflection of broader sociolinguistic realities rather than per official policies. These studies suggest that multilingual interaction is a common and feasible component of Pakistani education, challenging rigid monolingual approaches.

Research suggests that translanguaging enhances learner engagement, conceptual understanding, identity affirmation and inclusive classroom environments (Creese & Blackledge, 2010; García & Wei, 2014). In multilingual societies such as Pakistan, where students routinely navigate Urdu, English, and regional languages, classroom discourse increasingly reflects translanguaging practices instead of strict language separation.

Digital technologies have transformed the language learning landscape by offering learners multilingual content via social media, online gaming, streaming platforms, and artificial intelligence tools. Because English is the dominant language of digital communication, learners frequently acquire English words such as download, upload, search, share, and login through their everyday use of technology. Digital environments support authentic language learning (Godwin-Jones, 2018) and there is a growing interest in research on digitally mediated translanguaging (Lu & Gu, 2024). With the arrival of modern learners who have different levels of exposure to English via technology, teachers need to adapt their language of instruction. The issue is especially relevant in Urdu-medium primary schools where students are often exposed to English vocabulary through digital media while formal instruction is primarily in Urdu. Therefore, examining teachers'

reactions to these changing linguistic realities is important for the development of language policies and teaching practices that are relevant to multilingual and technology-enhanced educational environments.

Research Gap

Although there has been a considerable amount of international scholarship on code-switching (Auer, 1998; Gumperz, 1982), translanguaging (García & Wei, 2014), however, important gaps remain in the literature. Most of the previous studies conducted in Pakistan have focused on code-switching in English language classrooms, higher education contexts or bilingual teaching settings (Mirjat & John, 2024; Shamim, 2011). Relatively less research has been done on first language teaching and especially teaching of Urdu language at primary school level. The research on pedagogical role of codeswitching other than second language acquisition and ESL is to be focused now, hence the pedagogical codeswitching in first language acquisition, business communication Islamic educational institutions and technology-based disciplines is yet to be explored by the researchers. Moreover, previous research has rarely looked at how digital exposure affects teachers' code-switching practices. While studies recognize that students encounter English through technology, there is little evidence on how Urdu teachers view this and how it impacts their language choices during Urdu lessons. The connection between digital skills, accidental English learning, and native language teaching methods remains largely unexplored.

Theoretical Framework

This study draws on three complementary theories to explain how Urdu teachers integrate English vocabulary in digitally influenced primary classrooms including first of all Code-Switching Theory (Gumperz, 1982), it views code-switching as a purposeful strategy to negotiate meaning, clarify instructions and boost engagement, a deliberate pedagogical tool, not a deviation from norms. Secondly, Translanguaging Theory (García & Wei, 2014) it sees multilingual speakers as drawing on one integrated linguistic repertoire rather than switching between separate systems. Digitally exposed learners bring English vocabulary learned online into class, making this English use a form of meaning-making rather than interference. Thirdly, Sociocultural Theory (Vygotsky, 1978), it Emphasizes language and social interaction as tools for cognitive development, with teachers scaffolding learning. English acquired through digital exposure becomes an added mediational resource supporting comprehension.

Methodology

The study employed a qualitative research approach using an interpretivist paradigm to explore the perceptions and experiences of Urdu teachers regarding technology influenced code switching during the teaching of the Urdu language. A qualitative approach was appropriate as it provides an opportunity to gain an in-depth understanding of the participants' perspectives, experiences, and classroom practices (Creswell, 2018). The study focused on teachers' perception of learners' increased exposure to English through digital technologies and its impact on their language choices in teaching Urdu. The study looked at teachers' experiences and reflections to understand the evolving language practices in Urdu classrooms.

The study was carried out in four Urdu medium primary schools in Karachi, two each from public and private sectors. These schools were chosen as Urdu was the primary medium

of instruction and teachers often taught learners who had exposure to English through smartphones, social media, online games and digital videos. The inclusion of both public and private schools provided a wider insight into the use of language in classrooms in different types of schools. The study was conducted on fourteen (N = 14) Urdu language teachers. A purposive sampling technique was used to select the participants so that they could provide rich information regarding their classroom experiences and teaching practices (Patton, 2015). This is why only those teachers with at least three years of teaching experience were included so that they would have enough experience changing classroom language patterns.

There were 7 teachers from public sector schools and 7 teachers from private sector schools. All were teaching Urdu at the primary level and had first-hand experience of working with digitally-exposed learners. Their experience provided rich insights regarding the influence of technology-based exposure to English on Urdu language teaching. The demographic and professional profile of the participants is presented in Table 1.

Table 1. Demographic and Professional Profile of Participating Teachers (N = 14)

Teacher ID	School Sector	Age (yrs)	Highest Qualification	Teaching Experience (yrs)	Grade(s) Taught	Gender
T1	Public	49	MA	22	5	F
T2	Public	52	MA	27	5	F
T3	Public	44	MA	18	4	F
T4	Public	47	MA	13	5	M
T5	Public	35	MA	11	4	F
T6	Public	26	BA	5	4	F
T7	Public	25	BA	5	4	F
T8	Private	32	MA	9	5	M
T9	Private	44	MA	16	5	F
T10	Private	52	MA	23	5	F
T11	Private	31	MA	7	4	F
T12	Private	48	MA	20	5	F
T13	Private	27	BA	6	4	F
T14	Private	33	MA	7	4	F

Note. MA = Master of Arts; BA = Bachelor of Arts. Grade(s) Taught reflects the primary grade level(s) each teacher was assigned during the study period.

Data Collection and Analysis

Data were collected through semi-structured interviews, which is a commonly used qualitative method to explore participants' perceptions, beliefs and experiences (Kvale & Brinkmann, 2015). The interview protocol was designed based on the research objectives and relevant literature on code-switching, translanguaging, digital literacy and multilingual classroom practices. During interviews, teachers were asked about their perceptions of learners' knowledge of the English language, exposure to language via technology, use of English in Urdu teaching, and changing language practices within the classroom. The interviews were conducted in Urdu in person and individually and lasted for about 30-45 minutes. With participants' permission, all interviews were recorded and transcribed verbatim for accurate data analysis.

The obtained information was analyzed based on the thematic analysis framework which was described by Braun and Clarke (2006) and included six stages. The data analysis consisted of such

stages as familiarizing oneself with the data by carefully rereading the interview transcripts, developing the initial codes, generating the potential themes, reviewing and defining the themes, naming the themes and writing up the analysis. Coding was done inductively as the emerging themes were not predefined. The thematic analysis resulted in four major themes, summarized in Table 2 alongside their constituent sub-themes/codes and illustrative excerpts.

Table 2. Thematic Codebook Derived from Braun and Clarke's (2006) Six-Phase Analysis

Theme	Sub-themes / Codes	Description	Illustrative Code
Theme 1: Digitally Mediated English Lexical Familiarity	• Incidental vocabulary acquisition • Technology-specific lexis (download, login, search, share, skip, copy) • Functional language awareness	Learners recognize and use English terms encountered through smartphones, social media, games, and video platforms, independent of formal English instruction.	<i>"Students already know many English words before they learn them in school..." (T4)</i>
Theme 2: Functional Code-Switching as Pedagogical Scaffold	• Strategic (non-random) alternation • Comprehension support • Instructional efficiency • Bridging prior knowledge	Teachers deliberately insert English terms already familiar to learners to clarify meaning, save explanation time, and connect lesson content to learners' digital experience.	<i>"Using one English word saves several minutes of explanation in Urdu..." (T2)</i>
Theme 3: Emergence of Translanguaging Practices	• Fluid Urdu–English blending • Accommodation of learner language mixing • Integrated linguistic repertoire	Classroom talk increasingly draws on an integrated Urdu–English repertoire rather than two separated language systems; teachers tolerate/accommodate mixing when it supports meaning-making.	<i>"Students naturally combine Urdu and English when they speak..." (T6)</i>
Theme 4: Tension Between Monolingual Policy and Multilingual Realities	• Policy vs. practice gap • Concern over Urdu proficiency • Sector-based flexibility differences	Teachers navigate a conflict between curriculum/policy expectations of Urdu-only instruction and the practical, bilingual realities their learners bring into the classroom.	<i>"Policies assume a monolingual classroom, but today's students are exposed to multiple languages..." (T8)</i>

Findings

The thematic analysis of interviews carried out with fourteen Urdu language teachers teaching in two Urdu-medium primary schools of public and private sector yielded four main themes, namely, digitally mediated English lexical familiarity among learners, (2) functional code-switching as a pedagogical scaffold, (3) emergence of translanguaging practices in Urdu instruction and (4) contradictions between monolingual policy assumptions and multilingual classroom practices. In other words, the emerging themes suggest that the digital exposure of students has changed the classroom language practices. The distribution of these themes among participants shown below.

Table 4. Distribution of Themes Across Participants, by School Sector

Theme	Public-sector teachers (n = 7)	Private-sector teachers (n = 7)	Total teachers (n = 14)	% of sample
Digitally mediated English lexical familiarity	6	7	13	92.9%
Functional code-switching for scaffolding	7	7	14	100.0%
Emergence of translanguaging practices	7	5	12	85.7%
Contradictions between monolingual policy and multilingual classroom practices	6	6	12	85.7%

Digitally Mediated English Lexical Familiarity Among Learners

Another key insight from all interviews was teachers' awareness of the fact that modern learners have a lot of experience in using English words that they learn via technology but not in English language lessons. Interviewees said that students often use English words related to smartphones, social media apps, computer games, and digital gadgets.

They noted that students can understand and use words like download, upload, login, search, share, skip, and copy without any prior knowledge in English classes. Interviewees mentioned that learners started to use such vocabulary in their everyday communication.

One of the teachers who works in a private school said:

"Students already know many English words before they learn them in school. When I say 'search' or 'download,' they understand immediately because they use these words on their mobile phones every day." (T4)

Similarly, a public-school teacher noted:

"Earlier, children depended entirely on classroom learning, but now they come with knowledge from YouTube, games, and social media. Many English terms are already familiar to them." (T9)

The participants also observed that digital exposure had enhanced students' self-confidence in identifying English vocabulary, even though they could not speak English fluently. This trend was referred to as functional language awareness by the participants, which affected interactions within the class and comprehension. It seems clear that digital media have taken an important role as informal sources of English language exposure for Urdu-speaking children.

Functional Code-Switching as a Pedagogical Scaffold

Another important theme was the purposeful use of English language while teaching the Urdu language by the teachers. It was made clear that the process of code switching is not accidental and is performed by the teachers with the aim to make students understand the lessons better.

Many teachers revealed that they used English terms when explaining students something about which they have knowledge in a digital environment.

One participant stated:

"Sometimes using one English word saves several minutes of explanation in Urdu because students already understand that word from their daily digital activities." (T2)

Another teacher explained:

"If I completely avoid English words, students become confused because they hear these terms everywhere outside school. Using them helps connect classroom learning with their experiences." (T11)

Code switching was also found to be a good way to scaffold learning according to the teachers. Using Urdu to explain using English vocabularies, the teachers felt that this process would help in connecting the existing knowledge of the students with the new one.

These results indicate that code-switching is an effective tool in pedagogy to increase teaching effectiveness and engage learners.

Emergence of Translanguaging Practices in Urdu Language Instruction

A third theme revealed the gradual emergence of translanguaging practices within Urdu-medium classrooms. Although most teachers identified Urdu as the primary language of instruction, participants acknowledged that classroom communication increasingly involved the flexible use of both Urdu and English resources. Teachers reported that students frequently blended Urdu and English expressions during classroom discussions, questions, and peer interactions. Rather than correcting every instance of language mixing, many participants indicated that they accommodated such practices when they contributed to understanding and participation.

One teacher commented:

"Students naturally combine Urdu and English when they speak. Instead of stopping them, I focus on whether they understand the lesson and can express their ideas." (T6)

Another participant explained:

"The classroom is no longer purely Urdu. Students bring language from their digital world, and we have to work with that reality." (T13)

In fact, participants stated that classroom communication became more flexible, especially when dealing with technology-related ideas or any concept associated with students' technological knowledge. Teachers saw such linguistic flexibility as a necessity for today's world and not a hindrance to teaching the Urdu language. The results of the research reveal that Urdu-medium classrooms become multilingual learning environments in which meaning construction involves integration of linguistic tools rather than separation of languages.

Contradictions between monolingual policy and multilingual classroom practices

While appreciating the educational benefits of code-switching, the participants were also facing problems arising from the tension between classroom practice and the convention of using only Urdu for Urdu language instruction. A number of participants raised their concerns about possible negative impact of over-use of English on the development of competence in Urdu language. At the same time, it was suggested that using only Urdu in the classroom became increasingly impractical owing to students' language exposure outside school.

One teacher remarked:

"Officially, we are expected to teach Urdu in Urdu, but practically speaking, students already live in a bilingual environment. Ignoring that reality makes teaching more difficult." (T1)

Similarly, another participant stated:

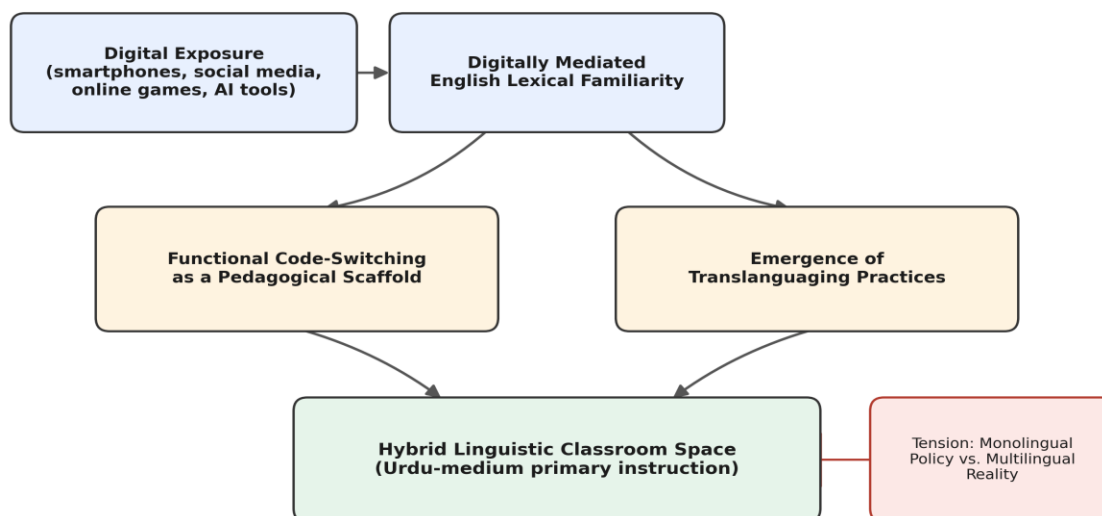
"There is a difference between policy and practice. Policies assume a monolingual classroom, but today's students are exposed to multiple languages through technology." (T8)

Consequently, the teachers found themselves in a continuous process of negotiating the dilemma of keeping Urdu language education true to its essence while adapting to the changing linguistic repertoire of the learners. Such a phenomenon was evident in both the public and the private school sectors, since, as Table 4 indicates, the number of teachers reporting this issue from each sector was six out of seven, meaning that the tension between policy and practice was equally felt in public and private schools rather than being confined to one sector only. However, sectoral differences were quite evident when it comes to other themes coded from the interview transcripts;

for example, the theme of translinguaging was reported by more teachers in the public (7/7) than private (5/7) sector.

In summary, the findings indicate that traditional monolingual approaches are increasingly being questioned in the face of changing reality in the form of digitally-connected learning environment. The findings reveal that teachers are modifying their teaching approach in light of these changing circumstances but at the same time trying to maintain the importance of Urdu in classroom instructions.

It is clear from the findings that digital technologies have become effective mediators in terms of affecting the linguistic repertoires and classroom practices of language learners. Teachers viewed students as entering the classroom equipped with rich English vocabulary gained as a result of digital interaction. In response, the use of strategic code-switching for facilitating comprehension and improving classroom interactions was adopted by participants. This resulted in the creation of translinguaging-oriented classroom settings on one hand and creating conflicts in the face of monolingual classroom practices on the other. Figure 1 below represents this process in the form of conceptual framework.



Theoretical lenses: Code-Switching Theory (Gumperz, 1982) • Translinguaging Theory (García & Wei, 2014) • Sociocultural Theory (Vygotsky, 1978)

Figure 1. Conceptual model of technology-influenced code-switching, illustrating the pathway from digital exposure to the emergence of a hybrid linguistic classroom space, as interpreted through Code-Switching Theory (Gumperz, 1982), Translinguaging Theory (García & Wei, 2014), and Sociocultural Theory (Vygotsky, 1978).

Discussion

The results of this study indicate clearly that the role of digital technologies is significant in changing language practices in Urdu medium primary classrooms and impacting teacher instruction with English in the teaching of Urdu language. The accounts provided by teachers reveal that modern students arrive at classrooms not just armed with their formal educational language knowledge but also their digital language knowledge gained in a large number of digital environments. Hence, language practices in the classroom are developing from conventional monolingual practices to more adaptive multilingual practices.

One of the important findings from this study is the knowledge of English vocabulary gained through digital experiences by learners. It was noticed that teachers always mentioned that students knew and used English terms related to smartphones, social media applications, online games, video sharing applications, and artificial intelligence. This finding is consistent with the literature on digital literacy where it has been argued that language learning today happens through informal and technology-based experiences and not only through institutionalized learning settings (Lankshear & Knobel, 2011). This implies that digital settings have become important sites of incidental language learning through encounters with English vocabulary repeatedly in meaningful settings. In consequence of this, learners who study in Urdu-medium schools acquire different levels of knowledge about English vocabulary.

This finding adds to previous research related to the use of code-switching in Pakistan educational contexts. Previous researches are related mostly to bilingual instruction, English language teaching, or higher education institutions. For instance, Mirjat and John (2024) have found that both teachers and students perceive code switching as an effective method of improving understanding and communicating in the classroom. This study supports their findings and extends them by focusing on Urdu language teaching in primary schools. Most importantly, the findings of this study show that teachers' code-switching behavior is becoming more and more affected by learners' digital vocabulary knowledge.

In addition, the present research shows that English is not used randomly but purposefully by the teachers while teaching in Urdu. Teachers explained that familiar English words have been used by them for clarification of concepts, better understanding of the concepts, and increasing the efficiency of the teaching process. These results have strong parallels with Gumperz's (1982) interactional approach to code-switching in which code-switching is considered as a communicative practice done purposefully for the management of interaction and negotiation of meaning. The use of English by the teachers is viewed by them as a pedagogical resource that allows them to relate class room material to prior experience of the students.

The findings also provide support for Vygotsky's (1978) sociocultural theory, particularly the concept of scaffolding. Teachers described using English vocabulary that students already understood through digital engagement to facilitate comprehension of new concepts presented in Urdu. In this sense, English served as a mediational resource that helped bridge learners' prior knowledge and new learning experiences. The strategic integration of familiar English terminology allowed teachers to operate within learners' zones of proximal development by connecting new content with existing cognitive resources. This suggests that technology-influenced code-switching can be understood not merely as language alternation but as a form of instructional scaffolding responsive to learners' evolving linguistic repertoires.

Findings also provide a good deal of support to Vygotsky's (1978) sociocultural theory and particularly to the idea of scaffolding. The study shows that teachers utilize their English vocabulary which is understood by students via digital interaction in order to help them understand new concepts that were explained via Urdu. Hence, English is seen as the mediator tool that connects learners' previous experiences and knowledge with new learning experiences. The use of appropriate English vocabulary helps teachers to stay within ZPDs of learners. It means that the code-switching that was affected by technology could be regarded not only as the process of switching from one language to another but also as a kind of instructional scaffolding.

The other valuable contribution that was made by the study is the discovery of translanguaging practices in Urdu medium classrooms. Teachers mentioned a lot of cases where they were using Urdu and English to help students interact and understand things. These findings are very relevant

to the definition of translanguaging that was given by García and Wei (2014). Translanguaging is seen as the utilization of the full linguistic repertoire by the learners rather than switching from one language to another. It is evident that the linguistic practices of the learners become more fluid and multilingual and are formed through school and non-school experiences.

The appearance of translanguaging strategies observed in this study is also related to the current realities in sociolinguistics in Pakistan. Despite the efforts of educational institutions to separate languages and conduct monolingual lessons, multilingual language use is still widespread in communicative practice. As noted in earlier studies by Rahman (2002) and Shamim (2011), there is a difference between the official language policy and real language use in Pakistani educational institutions. The current study shows how the use of digital technologies may expand the gap by adding new sources of exposure to English language that are outside the control of educational institutions. In accordance with this trend, recent findings of AI-mediated language use contexts indicate that more and more students initiate translanguaging on their own with the help of digital tools instead of being instructed by teachers (Waluyo & Rouaghe, 2025). Thus, creating monolingual learning environment becomes increasingly difficult for educational institutions when learners regularly use multilingual digital media.

Another interesting aspect of the data collected is the tension that participants experienced between the expected monolingual policy environment and reality in their classroom. Although they appreciated the importance of maintaining Urdu as the language of instruction, the participants also agreed that the exclusion of English from classroom discourse was impossible at times. In this regard, the results of this study can be viewed as part of the ongoing discussion about the relationship between language policy and pedagogy. Specifically, it seems clear that teachers have to negotiate between the expectations set forth by the institutional policy on one hand and linguistic reality in classrooms on the other hand. In this connection, there appears to be a pressing need for policies that recognize the reality of multilingual classroom environment.

Overall, the findings indicate the development of what can be called a technology-mediated hybrid linguistic space in Urdu-medium primary classrooms, as seen in Figure 1 below. The model demonstrates the interplay between formal expectations set by curriculum, informal digital language exposure, and the adaptation in the classroom context. As opposed to conventional views, according to which language learning is confined only to classroom instruction, it becomes clear that learners' digital language experience plays an important role in shaping classroom discourse and decisions related to instruction. In this way, the conceptual model shows how digital exposure helps develop bilingual linguistic resources, which then affect teachers' code-switching and support translanguaging-oriented instruction.

The study thus adds to the increasing literature related to multilingual education in the digital era. The study advances the extant theory of code-switching and translanguaging by emphasizing how digital technology acts as an agent of change in linguistic practices among primary classrooms. Moreover, the study offers insights into the area of Urdu-medium education, which is relatively less represented in international studies on classroom multilingualism. The results imply that language policy discussion, teacher training, and teaching practices need to take into account the effects of digital exposure on learners' linguistic competencies.

Conclusion, Limitations, and Future Research

This research investigated technology-induced code-switching within the context of Urdu medium primary classrooms, whereby it considered how teachers perceive and react to the English language exposure of the learners through digital technology. Based on interviews conducted

among fourteen Urdu teachers in both public and private schools, it was found out that learners are increasingly arriving in classrooms with exposure to the English language through the use of digital technology, such as smartphones, social media, games, video-sharing websites, and artificial intelligence. In reaction to the same, teachers have been found to incorporate the English language in their instruction in Urdu to explain concepts, make learning easy, increase engagement, and instructional efficiency.

It can be observed from the results that Urdu medium classrooms are gradually changing from their monolingual contexts to become more multilingual, considering digital technology, pedagogy, and translanguaging. Even though the primary language of instruction is still Urdu, the teachers realize that the exposure of learners is no longer confined only to the classroom.

However, there are some limitations of this study. Firstly, this study is based on the responses of fourteen teachers at four schools only. This study does not consider the views of the students and classroom observation. Secondly, this study is restricted only to Urdu medium primary schools.

The future research can focus on the role of technology on code-switching in larger and diverse educational institutions. The students' perspective and classroom observation should be included in the future research for better understanding of the issue. Future research can include comparative analysis of Urdu medium, English medium, and bilingual schools for a better understanding of how digital exposure influences classroom communication. Future research can also include the influence of emerging technologies, such as artificial intelligence, on multilingual classrooms.

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