

Uncertainty, Resilience, and Beyond: ICTs in Protracted Socio-political Disruptions

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This is to certify that the thesis titled “*Uncertainty, Resilience, and Beyond: ICTs in Protracted Socio-political Disruptions*”, being submitted by *Asra Sakeen Wani* to the Indraprastha Institute of Information Technology Delhi (IIIT-Delhi) for the award of the degree of Doctor of Philosophy, is an original research work carried out by her under the supervision of Prof. Pushpendra Singh (IIIT-Delhi, India). In my opinion, the thesis has reached the standards fulfilling the requirements of the regulations relating to the degree.

The results presented in this thesis have not been submitted in part or whole to any other university or institute for the award of any degree/diploma.



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CANDIDATE'S DECLARATION

The author hereby declares that the work presented in the thesis titled "*Uncertainty, Resilience, and Beyond: ICTs in Protracted Socio-political Disruptions*", submitted as partial fulfillment for the award of the degree of Doctor of Philosophy to the IIT-Delhi is an original research work carried out under the supervision of Dr. Pushendra Singh (Professor, Department of Computer Science, IIT-Delhi, India).

The results presented in this thesis have not been submitted in part or whole to any other university or institute for the award of any degree/diploma.



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Dedicated to the enduring spirit of resilience and strength that defines Kashmir and its people. This work is inspired by the uncertain journey and steadfast courage that have been constant companions in the pursuit of knowledge and understanding. May this contribution honor the unyielding resolve of those who thrive amidst challenges, embodying the essence of perseverance and hope.

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Abstract

The global recognition around the transformative potential of Information and Communication Technologies (ICTs) highlights their crucial role in shaping and enriching critical aspects of human development. Alongside this recognition, the United Nations' Sustainable Development Goals (SDGs) have also emphasized the promotion of ICTs for integration into various development efforts to accelerate progress on critical developmental goals. In alignment with these efforts, Human-Computer Interaction (HCI) research has increasingly focused on enhancing human development in diverse contexts through technology. By actively directing efforts to understand the impact of technology, e.g., on education, economic advancement, mental health, and well-being in resourced and under-resourced settings. However, regions going through ongoing socio-political unrest face varied developmental challenges. Among many other challenges, these regions often face restricted access to technology and resources, and the socio-political situation impacts the way technology is used and the outcomes it produces. This dissertation is situated in Kashmir, India, a region affected by socio-political conflict for over three decades. The protracted conflict has disrupted almost all developmental aspects, including education, due to prolonged closures of schools and colleges, worsened socio-economic conditions, particularly through rising unemployment among young people with higher education levels, and rising mental health challenges. Anchored in the domain of HCI, this dissertation presents five case studies that explore the impact of socio-political conflict in Kashmir, India, across domains of human development, including education, economic opportunities, and mental health. For that, we ask how do individuals utilize technology in regions affected by socio-political unrest. And, how might this understanding inform the development of culturally sensitive and contextually appropriate technologies to address the challenges faced in these regions. This dissertation further explores existing infrastructural support, the practices of individuals involved, and the technological assistance available for navigating the intertwined areas of education, employment, and mental health support. Through qualitative methods, this work draws on field visits and almost 100 semi-structured interviews with varied stakeholders and non-government organizations to investigate the barriers in education, job-seeking, self-employment opportunities, and access to professional mental health care. Building on the insights from these studies, this work highlights that research in such regions requires a specialized approach considering the region's specific context and challenges. This work discusses socio-technical design recommendations shedding light on the impact of protracted socio-political crises on human development and contributing to the HCI communities' understanding of such regions.

Chapter 1

Introduction

CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1 Motivation and Context

The research in Human-Computer Interaction (HCI) has been extensively directed toward understanding the impact of technology on various developmental domains of human life. For example, education [26, 376], employment [395], entrepreneurship [153], mental health [276], and women’s health and well-being [209], among others in resourced and under-resourced settings. Similarly, international organizations have recognized these domains and identified them as crucial for achieving the United Nations Sustainable Development Goals (UN SDGs) [368]. They have also emphasized the promotion of ICTs for their integration into various development efforts to accelerate progress on critical developmental goals. However, regions affected by ongoing socio-political conflicts present a unique set of challenges for HCI research with restricted access to technology and resources, and the socio-political context significantly impacts the way technology is used and the outcomes it produces. Thus, HCI research in such regions requires a specialized approach considering the region’s specific context and challenges.

My dissertation situates the work in Kashmir, India, which has been affected by socio-political conflict for over three decades. To provide geographical context for the regions explored in this dissertation, a map of Jammu & Kashmir is presented in Figure 1.1. Historically, the region of Jammu & Kashmir (J&K)¹, particularly Kashmir in India, has been a disputed territory between India and Pakistan since 1947. This longstanding dispute has resulted in several wars and numerous military conflicts, leading to a complex political situation in the region [163]. Its impact extends, affecting the crucial aspects of human development, compounded by prolonged lockdowns and internet shutdowns [240, 193]. For example, this has significantly affected the education sector, resulting in prolonged closures of schools and colleges [389]. Consequently, inadequate educational infrastructure has also adversely affected the employment sector. These challenges contribute to a rising unemployment rate, especially among young people aged 18-29, those with higher levels of education, and individuals with technical or postgraduate degrees. Additionally, the prolonged conflict in the region has led to various mental health issues among its residents, including anxiety, depression, and

¹[https://en.wikipedia.org/wiki/Jammu_and_Kashmir_\(union_territory\)](https://en.wikipedia.org/wiki/Jammu_and_Kashmir_(union_territory))

post-traumatic stress disorder (PTSD) [149, 150]. A significant portion of the population in the Kashmir Valley, approximately 45%, suffers from these mental health issues, with particularly high prevalence rates compared to the global average [149]. Access to mental health resources remains limited, with only 10% of those affected receiving treatment due to a lack of available services [149]. Addressing these issues in the context of the ongoing conflict presents an opportunity for designing technology solutions sensitive to the population's unique needs.

With this, my research explores the population's use of technology with challenges and barriers to various critical domains essential for human development, e.g., education, job-seeking opportunities, and mental health support seeking in the region of J&K, India, which has been affected by socio-political conflict. Through field visits and semi-structured interviews with diverse stakeholders and non-government organizations. This dissertation examines the impact of disruption on education and the role of community learning centers in overcoming education barriers within the context of the conflict. It also examines the systemic infrastructural challenges faced by youth in the region in their job-seeking efforts and analyzes the workarounds used to mitigate these challenges.

I also explore how do the people in the region navigate the access to support seeking mental health and well-being, given the intertwined contextual challenges of the region. This research aims to contribute to filling the gap in understanding the impact of socio-political conflict on education, employment, and mental health well-being in this specific context and provides socio-technical design recommendations for similar contexts.

1.2 Researcher Positionality

Born and raised in Srinagar, Kashmir, with over 20 years of experience in the region. I have had my own lived experience of the unrest and the political events that have shaped the region's history. The unrest and



Figure 1.1: Map of Jammu & Kashmir and surrounding regions, providing geographical context for the areas of study in this dissertation.

crises in Kashmir have shaped my academic journey, and studying amidst these challenges has motivated my focus on understanding the nuanced narratives within the region. However, the initial conceptualization and formation of the studies carried out across this dissertation were collaboratively undertaken with my colleagues. The foundation of the studies has emerged from joint brainstorming sessions and collectively drawing from their insights and my experiences. Fluent in Kashmiri and Urdu, I conducted interviews locally, leveraging my cultural understanding. My positionality is grounded in the socio-cultural and political realities of Kashmir. This insider perspective was instrumental in shaping the methodological approach of this dissertation, particularly its reliance on qualitative inquiry and an interpretivist stance. My familiarity with the local context, language, and cultural nuances facilitated the establishment of trust with participants, enabling the collection of rich, contextual data that might otherwise be inaccessible. It is also important to note that we all, as a team involved throughout this dissertation, share a common motivation to enhance access to resources, advocate for improved services, and bring to light the additional challenges and barriers faced by the people in the region. We also acknowledge that our individual backgrounds and experiences might inherently influence the interpretation of the data. However, our shared commitment to this cause inevitably shapes the lens through which we analyze our data and present the findings. We request that this manuscript be read with an understanding of this collective perspective.

1.3 Research Paradigm and Methodological Approach

This dissertation adopts a qualitative research approach that is grounded in an interpretivist and constructivist epistemology [272]. This orientation assumes that knowledge is not fixed or objective, but socially constructed and contextually situated. Such a stance is particularly important for research conducted in politically sensitive like Kashmir, where lived experience, historical memory, and local adaptations shape how technologies are used and understood. The methodological choices made in this dissertation—including semi-structured interviews, participant observations, long-term engagement, and thematic analysis—were selected for their ability to foreground nuance, capture everyday practices, and allow flexibility in responding to uncertainty in the field. Rather than treating qualitative methods as a default, this approach was an intentional response to both the research questions and the political, ethical, and infrastructural conditions in which the research was situated. This approach is informed by and contributes to existing HCI research on protracted crisis contexts, where interpretive and reflexive methodologies have been central to under-

standing infrastructures, resilience, and technology use under duress [348, 347]. In building on this body of work, the dissertation emphasizes methodological intentionality and coherence across case studies, while also acknowledging the tensions and limits inherent in representing such complex realities.

1.4 Research Questions and Goals

This report draws on five completed case studies that broadly answers the following research questions –

- RQ1:** How has socio-political conflict impacted the effectiveness of digital and community-based interventions across different sectors such as education, employment, and mental health?
- RQ2:** How do individuals utilize technology to fulfill their needs throughout different stages of the above-mentioned developmental factors during conflict and adversity?
- RQ3:** How might we design technology or catalyse existing solutions to mitigate challenges within conflict-affected environments to promote accessible, inclusive, and equitable futures?

This section provides a brief overview of the five case studies, outlining the broader research agenda and the contributions made.

1.4.1 Case Study I: Education

RQ: How is the current infrastructure offering support to continue education during disruption?

Education is widely recognized as a fundamental pillar of human development, and Sustainable Development Goal 4 underscores the importance of ensuring inclusive, equitable quality education and lifelong learning opportunities for all. However, regions experiencing ongoing socio-political conflict often face significant disruptions to education and learning, hindering progress toward these goals. For this study we partnered with an NGO in Srinagar, working with vulnerable children and marginalized youth through their quality education and socio-economic initiatives. I did multiple field visits and conducted 21 semi-structured interviews with parents, teachers, students, and members of the NGO that runs Community Learning Centers in Kashmir. The findings from this work present the barriers in education caused by disruption and the role of community learning centers in overcoming the barriers within these contextual constraints. Further, this work discusses engaging researchers and policymakers to leverage human infrastructure, embedding

uncertainty into the design, infrastructuring trust, and content usability to develop solutions to make education more accessible. Despite significant research in HCI and Education, research in this particular context is under-explored, and the work contributes to filling this gap. The work is published at *CHI 2022* [389].

This study served as a foundation for shaping our future research agenda. Drawing on the learnings' and discussions with stakeholders, this study revealed two critical developmental challenges that shaped our future research agenda. First, it highlighted the deep interconnections between educational disparities and economic advancement, particularly in terms of access to job opportunities. Second, it emphasized the barriers to women's economic participation, which further restrict their progress. Together, these challenges contribute to broader impacts on mental health and overall well-being. These learnings' and insights opened avenues of inquiry for our future research investigations on how other developmental aspects are affected and the role of digital infrastructure in enabling or hindering progress.

This case study directly contributes to addressing RQ1 and RQ2 by detailing the impact of conflict on a critical developmental sector and implicitly informs RQ3 by highlighting needs for context-sensitive interventions.

1.4.2 Case Study II: Employment

RQ: How do the existing infrastructure offer support to the youth in the job-seeking process?

The issue of youth unemployment is a global concern, with active initiatives, policies, and technologies in place to support employment seekers. Despite these efforts, youth unemployment in various regions is attributed to the complex challenges that impede access to resources, particularly in contexts characterized by socio-political unrest. This work employed qualitative methods, where we conducted 21 semi-structured interviews (11 male, 10 female) with participants who had recently secured a job or were actively seeking one. The findings from this work present the systemic infrastructural challenges the youths face due to the ongoing crisis. Analyzing the youths' workarounds to mitigate these challenges. This work discusses how we might leverage these workarounds into designing systems while navigating through the contextual complexities. We discuss the challenges of designing in the context and provide design recommendations to support job seekers. The work is published at *CSCW 2024* [388].

Furthermore, based on insights from this study, we observed that the challenges faced by women in our context were far more nuanced. Their opportunities for economic advancement were significantly more restricted, with notable gaps hindering progress. To better understand these complexities, we explored how

women navigate these constraints to integrate themselves into the workforce, especially in light of limited mainstream job opportunities. To gain a deeper understanding, we investigated two key areas. First, we examined how women engage in offline entrepreneurial activities, often driven by local initiatives aimed at training and empowering them for economic mobility. Second, we explored how women with access to digital platforms leverage these tools to enhance their economic mobility, generating income and opportunities by utilizing online spaces. These inquiries provided valuable insights into the diverse strategies women adopt to overcome structural barriers and advance their economic agency. An overview of these aspects is provided in the following two subsections.

This case study primarily addresses RQ1 by examining the impact of conflict on employment, RQ2 by exploring how youth utilize existing infrastructure and workarounds for job-seeking, and RQ3 by offering design recommendations for employment support.

1.4.3 Case Study III: Skill-based Entrepreneurship

RQ: How do community training centers support women in developing entrepreneurial skills?

Despite global efforts for women's inclusion in the workforce, challenges persist, especially in conflict-affected areas where socio-political, economic, and cultural norms further impede their economic participation. For this study, we collaborated with an NGO in Kashmir, dedicated to empowering women through skill-building programs. The NGO operates community training centers focused on vocations like tailoring, traditional crafts, and small-scale production. We conducted 15 semi-structured interviews with women participating in these training programs and observed their interactions with the training environment. The findings highlight socio-political and cultural barriers, such as societal norms, gender stereotypes, and technological gaps, that constrain women's entrepreneurial aspirations. The work also underscores the critical role of these centers in fostering self-reliance, providing tailored skill development, and encouraging home-based businesses. Furthermore, we discuss socio-technical design recommendations for integrating localized technology solutions and bridging infrastructural gaps. This research contributes to understanding entrepreneurship in conflict-affected areas, emphasizing the intersection of social context and technology. The work is published at *GROUP 2025* [390].

This study primarily addresses RQ1 by exploring the impact of conflict on women's economic participation, RQ2 by examining how women utilize community training centers for skill development, and RQ3 by proposing design recommendations for contextually sensitive entrepreneurial support.

1.4.4 Case Study IV: Social-media based Entrepreneurship

RQ: What are the experiences of women navigating online entrepreneurship, and how do technological and socio-cultural infrastructures influence their practices?

Women across the world face marginalization in accessing mainstream economic opportunities due to numerous factors, such as unequal access to jobs, workplace harassment, and gender stereotypes. These challenges become even more pronounced in regions with deep-rooted socio-political and patriarchal norms. However, the recent growth in online infrastructures and social media platforms has expanded the boundaries of work, where new avenues such as online entrepreneurship have emerged as favorable economic opportunities for women. This study examines the entrepreneurial journeys of women leveraging social media for small-scale businesses in Kashmir. Using a qualitative approach, we conducted 19 semi-structured interviews with women entrepreneurs operating on platforms such as Instagram, Facebook, and WhatsApp. Our findings reveal the dual role of social media: as a liberating infrastructure enabling economic independence and as a challenging space fraught with socio-cultural stigmas, online harassment, and infrastructural constraints. We further unpack how societal expectations, platform-specific challenges, and the gendered digital divide intersect to shape their entrepreneurial experiences. The study also identifies strategies women employ to navigate these barriers, including leveraging online and offline support networks and tailoring their business practices to align with cultural and religious norms. This work contributes to understanding how socio-technical and gendered ecosystems impact digital entrepreneurship among women. It also offers design implications for platform developers and policymakers to build supportive, culturally sensitive online infrastructures that foster equitable entrepreneurial opportunities for women. This work is under-submission at *GoodIT 2025*.

This case study directly addresses RQ2 by investigating women's utilization of social media for economic mobility and RQ3 by offering design implications for culturally sensitive online infrastructures and policy.

1.4.5 Case Study V: Mental Health and well-being

RQ: How do people navigate through the processes of seeking professional mental health services?

Mental health well-being is a global concern, with disparities in treatment services being a challenge. Though, digital mental health interventions are proposed to bridge the gaps and supplement support and assistance. Yet, many individuals still struggle with mental health issues, particularly in regions encoun-

tering socio-political unrest, and face obstacles in seeking professional assistance. Here we investigate to understand the underlying challenges around seeking mental health support. To answer this, we conducted 18 semi-structured interviews with participants seeking professional support facilitated by a practicing psychologist in a clinical setting. This work aimed to explore how individuals navigate mental health and professional help-seeking. The findings identify the struggles in seeking support rooted in the context through socio-political and socio-cultural influences, strategies and methods adopted to navigate these struggles, and the role of technology in seeking support. Using a social-ecological approach to mental health care, this study emphasizes accounting for the socio-political realities that shape support-seeking in politically disturbed contexts and offers socio-technical design recommendations. The work is published at *CHI 2024* [387].

This case study primarily addresses RQ1 by examining the impact of conflict on mental health, RQ2 by exploring how individuals navigate support-seeking and technology use for well-being, and RQ3 by proposing socio-technical design recommendations for mental health support in conflict-affected regions.

1.5 Contributions

This research extends Human-Computer Interaction (HCI) scholarship by offering situated, empirical insights into how technological infrastructures intersect with critical aspects of life (e.g., education, employment, mental health, and well-being) in Kashmir, India. Drawing on five qualitative case studies, the thesis foregrounds the sociopolitical and infrastructural conditions that shape how people adapt and respond to technology in contexts of protracted crisis. This dissertation deepens our understanding of how long-term instability impacts everyday life and human development. It shows how disruptions in education ripple into constrained employment opportunities, which in turn affect mental well-being and access to care. These interconnected struggles offer a holistic view of vulnerability in conflict-affected regions. The central contribution of this work lies in advancing the idea of designing with uncertainty, where unpredictability is not an exception but a structural reality. Across the chapters, my work explores how people and institutions build resilience through informal networks, workaround practices, and trust-based infrastructures. It also highlights how infrastructuring in such contexts demands sensitivity to surveillance, institutional distrust, and cultural specificity. Together, learnings across the studies offer a layered account of resilience, uncertainty, and infrastructuring within HCI. They lay the groundwork for designing context-sensitive, hybrid

socio-technical systems that can operate under conditions of constraint and precarity. This work contributes to both HCI and HCI for Development by pushing for more grounded, inclusive approaches to technological design in conflict zones. It calls on the research community to engage more deeply with conflict-affected communities, whose challenges are often overlooked in dominant narratives of technological progress.

1.6 Overview of the report structure

The remainder of this report is as follows. In Chapter 2, I review the existing HCI literature and position my work at the intersection of the scholarships of crisis informatics, infrastructures, uncertainty, resilience and HCI. Chapters 3, 4, 5, 6 and 7 presents the studies conducted as part of my work. In chapter 8, I draw on the studies as a whole to summarize the contributions of this dissertation: presenting a comprehensive analysis of how ICTs intersect with socio-political conditions, policies, and local adaptations in conflict-affected regions.

Chapter 2

Related Work

CHAPTER 2

RELATED WORK

Below, I outline the prior scholarship in HCI, which is at the intersection of crisis informatics and the relationship of technology around infrastructures, uncertainty and resilience for development work.

2.1 Crisis informatics and HCI

Different populations and communities across the globe continue to face disruption to various events such as natural calamities, public health crises, war & violence, etc. The prevalence of various technologies such as ICTs, social media, etc., has also found its usage during such disruptions [335]. Scholarship in HCI, CSCW, ICTD has explored the role and application of technology during crises and disruptions [334, 324, 243], also termed as crisis informatics. Research in crisis informatics has provided heterogeneous account of technology use and implications during various crisis events, such as, floods [324], earthquakes [334], riots, criminal and political violence [77], war [243], etc. Prior literature has shown the different use of technologies during disasters and natural calamities. Shaw et al., [324] in their investigation of Twitter use during Queensland flood highlighted the use of social media as both communication and an emergency management tool. They found out that social media provided a space for emotional exchanges and distress communication. Similarly, Vieweg et al., [380] studied the use of micro-blogging web posts during the Oklahoma Grassfires of April 2009 and the Red River Floods. They highlighted the need to better design the information extraction systems to enhance situation awareness with a broadcast message for a broader population and individuals. Researchers have also explored the technology use during the public health crisis as well [133]. Gui et al. [133] conducted a qualitative analysis of social media posts related to Zika virus spread to understand the use of such communication by public health bodies and citizens. They unfurled the discussion on technology use in decision-making during such a crisis, as users often struggled to find credible information.

Researchers have also explored the technology used during the conflict, war, and riots [243, 77]. Mark et al., [243] conducted an ethnographic interview study in the context of Iraq that has been facing a protracted conflict to understand the resilient practices adopted by the citizens using technology to carry out their day-

to-day activities. Their work highlighted the limitations posed by the environment and how the citizens reappropriated tech, devised patterns, and adopted practices that enabled them to adapt to the environment and even be productive. De Choudhury et al., [73] studied the affective dimensions of Twitter data during the Mexican drug war violence. Their findings highlighted the gradual effective change in the tweets during the protracted war and its impact on people’s psychological well-being, and they argue for better designing tools to cater to the mental health needs of such communities. However, the experiences and the challenges cited in the existing scholarship are materially diverse depending on the nature of the conflict and do not generalise uniformly across geographies. Moreover, conflict-affected contexts such as Kashmir still are understudied within HCI research.

2.2 Uncertainty, Resilience, and HCI

Uncertainty in Human-Computer Interaction (HCI) has garnered significant attention, with researchers exploring how users perceive, cope with, and manage uncertainty across various contexts [331]. Soden et al. conceptualize four distinct “modes of uncertainty” in HCI: epistemic uncertainty (uncertainty about knowledge), ontological uncertainty (uncertainty about existence), situational uncertainty (uncertainty about context), and ambiguity (uncertainty about interpretation) [332]. These modes provide a structured lens to frame research objectives, methods, and theoretical perspectives within HCI. Researchers have investigated how uncertainty influences user experience, trust, comprehension, and decision-making. For instance, studies have examined uncertainty as something to be tamed or disciplined, utilized as a generative resource, shaped by political contexts, or experienced affectively through emotional dimensions [332, 331]. This nuanced understanding underscores the need to consider how uncertainty is conceptualized, situated, and addressed in interaction design. Interactive systems such as personal health applications, intelligent navigation tools, and machine learning-driven applications often incorporate uncertain information [333, 133, 285]. These systems face the dual challenge of communicating uncertainty in a way that enhances user comprehension without causing confusion or distrust. Addressing this challenge, researchers aim to develop design guidelines that help designers determine when and how to effectively convey uncertainty, fostering better decision-making and user engagement [145]. This body of work provides critical insights into the role of uncertainty in HCI, emphasizing its importance in designing user-centric, transparent, and trust-worthy systems.

Resilience in HCI focuses on designing systems and interfaces that can adapt to and recover from disruptions or failures [243]. This encompasses both technical resilience, which involves creating systems capable of fault tolerance, redundancy, and robust error handling, and human resilience, which supports user adaptability and coping strategies [242]. *Technical Resilience:* Research in this domain often draws on principles from systems theory and distributed systems to ensure continuous operation under adverse conditions. Techniques such as redundancy, distributed data placement, and automated data management have been employed to enhance system performance and reliability. For example, hyper-converged infrastructures integrate storage, networking, and computing resources into a single platform to minimize downtime and ensure accessibility during hardware failures. In critical systems like healthcare, aviation, and disaster response, technical resilience ensures that essential functions remain operable, safeguarding reliability and safety [330]. *Human Resilience:* This aspect emphasizes users' ability to adapt to and recover from disruptions, often grounded in psychological and social theories [330]. Research has explored how interface design can support decision-making and problem-solving under stress by incorporating features such as real-time feedback, alternative pathways, and increased user control [311]. These strategies enhance users' capacity to cope with uncertainty and maintain productivity during disruptions. A holistic approach to resilience integrates both technical robustness and user adaptability. For instance, resilient communication systems designed for disaster response ensure the accessibility of critical information during connectivity issues [243, 242, 330]. Similarly, technologies designed for conflict-affected areas, such as offline-capable communication platforms, enable users to access essential services like healthcare and education even under challenging conditions [348]. Resilience in HCI is thus a multifaceted concept that aims to create systems capable of preventing failures while empowering users to recover from them. By addressing both technical and human dimensions, researchers aim to design robust, flexible, and user-centric systems that perform reliably across a variety of adverse scenarios.

Drawing on these concepts, this thesis situates the intersection of uncertainty and resilience within the socio-political context of Kashmir. By exploring how HCI can support individuals and communities navigating uncertainty and building resilience, it seeks to offer design recommendations that address the lived realities of users in conflict-affected areas. The work aims to provide theoretical and practical contributions to HCI by advancing understanding of how systems can balance uncertainty management with resilience, enabling sustained functionality and user support in challenging conditions.

2.3 Infrastructures and HCI

The intersection of Human-Computer Interaction (HCI) and infrastructures is a growing field that explores how technological infrastructures shape and are shaped by human interactions. This research area encompasses various aspects, including the design and use of infrastructures in ways that enhance user experiences and support societal needs. The concept of infrastructures is inherently intricate, and influenced by various interrelated systems. These encompass, among others, social networks [85, 144], accessibility to resources [312, 403], digital illiteracy [395, 350], policy and educational resources [120, 367]. Many of these systems have been examined in the HCI scholarship as integral components of the broader infrastructures within which they operate. Thus, in order to comprehensively understand the intricate dynamics of employment in Kashmir, it is essential to analyze the infrastructures that exert influence upon them. Infrastructure is typically understood as an underlying physical or technical framework that facilitates a society or groups to function in certain ways. Star stated that infrastructure is not only a physical or technical system but also a relational and ecological one. Different groups attribute different meanings to infrastructure, and it forms an integral part of the balance among action, resources, and the context [339]. Star and Ruhleder carried out fundamental work on infrastructure and defined various properties of an infrastructure [341]. They defined infrastructure to be deeply embedded within societal structures and arrangements. Star and Bowker also stated that Infrastructure becomes visible when it breaks down or is disrupted [337]. This has previously motivated various studies [104, 14, 65, 189] on infrastructure and methodologies that can help in building or repairing disrupted infrastructures. The role of technology as a means for repairing disrupted infrastructures has been widely studied. Seeman's research focused on the concept of 'routine infrastructure,' where technology is utilized as a resource to develop resilience during disruptions [310].

Building on these foundational understandings, scholarship within HCI, particularly feminist infrastructure studies and decolonial computing, offers critical lenses to examine how power, gender, and colonial legacies are embedded within and perpetuated by technological systems and their underlying infrastructures [22, 68, 277]. Feminist infrastructure studies, drawing on work by scholars like Star, emphasize how infrastructures are deeply intertwined with social structures and often become invisible until they fail or disproportionately affect marginalized groups [340]. This perspective further highlights how technology design and access can be gendered, perpetuating existing inequities or, conversely, offering pathways for empowerment. For instance, research has shown how patriarchal norms can shape women's technology use,

impacting their privacy and agency within digital spaces [343]. Similarly, decolonial computing interrogates the universalizing assumptions in technology design, arguing for approaches that acknowledge and address historical injustices and local realities, particularly in the Global South [68]. This includes understanding how conflict-affected regions, often shaped by colonial histories, experience technology not as a neutral tool but as a contested terrain where existing power dynamics are continually re-negotiated. This dissertation is informed by these critical perspectives, aiming to unpack how socio-political and cultural influences in Kashmir specifically shape interactions with, and the design of, digital and human infrastructures, contributing to a more nuanced understanding for building resilient socio-technical systems.

There has also been a recent focus on recognizing the significance of human infrastructure in HCI scholarship. Sambasivan et al. have defined human infrastructure as the fundamental basis of a social system, comprising interconnected patterns of relationships among individuals through diverse networks and social arrangements [302]. Human infrastructure has been used as a lens to evaluate other infrastructures and holds importance in understanding social processes [219, 102]. Semaan et al. [313] broadened the concept of human infrastructure by incorporating the lens of social infrastructure such as social media [254] and how it can provide contextual support and resource collection in contexts of crisis. This encompasses the technologies that aid the coordination of human actions and interactions, including the elaborate aspects of human infrastructure. It includes both known and unknown social connections, ranging from close-knit family units to distant and local social connections. Cyberinfrastructure is another type of infrastructure that influences the use and access of technology and holds importance when discoursing technology-enabled solutions in disrupted contexts. It typically involves hardware or software tools and resources to support technological solutions. Lee et al. emphasized the need to understand the human infrastructure in order to achieve a successful cyberinfrastructure [219]. Bin Morshed et al. explored the technological infrastructure of Bangladesh and the political placement [215] of an individual in it in order to understand the usage of the internet and impacts of internet shutdowns among communities of the region [35]. Infrastructural care is another concept that holds importance in discoursing technological interventions to support regions undergoing disruption. Dye defined infrastructural care as a relational effort to provide support for people going through disruption using infrastructural means [101]. Her work on the usage of social media platforms by Venezuelan diaspora activists explains the use of existing social infrastructures and cyberinfrastructures to aid people in crisis. While exploring employment dynamics existing in crisis struck context of Kashmir, understanding the nuances of infrastructures like human, social, and cyberinfrastructure and concepts like

infrastructural care to utilize these systems effectively stands essential. Our work highlights the experiences of Kashmiri youth as they navigate the job-seeking processes, specifically through the utilization of technical employment platforms in Jammu and Kashmir, India. Our findings present various challenges these individuals face, emphasizing the extent and limitations of both formal and informal institutional support. We also explore how offline and online mediums bridge infrastructural deficits, particularly in unconventional circumstances. Our analysis further extends to understanding the challenges, constraints, and opportunities presented by technological platforms and resources available to the Kashmiri youth. We apply this knowledge in our discussions to extract patterns and insights from our findings.

Chapter 3

Case Study I: Education

Asra Sakeen Wani, Divyanshu Kumar Singh, and Pushpendra Singh. (2022, April). “*Hartal (Strike) Happens Here Everyday*”: Understanding Impact of Disruption on Education in Kashmir. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (pp. 1-17).

CHAPTER 3

CASE STUDY I: EDUCATION

3.1 Introduction

Education is considered fundamental to human development. The United Nations Sustainable Development Goals (SDGs), especially SDG4, reflects a growing focus on prioritizing education that aims to offer universal quality education and lifelong learning for all [116]. The goal emphasizes the need to deliver education as a basic fundamental right that must ensure inclusive quality education and learning opportunities for all. However, the regions facing ongoing or protracted socio-political conflicts face disruptions to day-to-day activities [243]. Thus, attributed to the underlying tensions due to such prevailing circumstances, education in these regions is not regarded as an immediate concern and is often overlooked [287]. The conflict disrupts the formal and informal educational processes and jeopardizes the development of a robust, stable civic society and the education of aspiring children. Moreover, the regions with ongoing socio-political disruptions face a myriad of unique challenges with an increased number of school dropout rates, poor literacy levels, safety concerns for accessing education, infrastructural issues, among many [369]. All these issues put children from such areas at a higher risk of being illiterate [369].

The Jammu & Kashmir region in India, particularly Kashmir, continues to face ongoing socio-political disruption and insurgency [19] for almost three decades. The political unrest experienced by the population has flared significant disruptions to almost all the spheres of their lives [163, 294]. Moreover, due to the decades of conflict, education in Kashmir has remained in a consistent state of dismay. As one of the crisis's most glaring casualties, the education sector has observed a severely direct impact on children's education since 1990 [240]. Schools and colleges have remained closed for months during the periodic and extended periods of unrest, which has compromised the quality of education. It is faced with a loss of more than 60% of the total working days in the academic calendar. In 2019, after the revocation of Article 370¹ on August 5, 2019, at least 1.5 million Kashmiri students remained out of school for 202 days [28]. It is further compounded by the indefinite internet and communication blackouts². Thus, exposing the weaknesses in

¹https://en.wikipedia.org/wiki/Article_370_of_the_Constitution_of_India

²<https://internetshutdowns.in/static-page/jammu-kashmir/>

the educational ecosystem, which has failed to absorb the adversarial shocks, especially for internet use. Furthermore, the COVID-19 pandemic has worsened the scenario.

Chapter Overview: This chapter initiates the dissertation’s empirical inquiry by addressing Research Questions 1, 2 and 3 within the domain of education. It explores how protracted socio-political conflict has profoundly disrupted educational infrastructures, simultaneously examining how community learning centers and local actors adapt to ensure continuity. In doing so, it offers insights into the limitations of existing institutional support and the situated strategies people employ to repurpose technology and human infrastructure to sustain learning amidst pervasive uncertainty

3.2 Education and HCI

The domain of education has been a primary focus of research across all the research communities. A large body of existing scholarship in HCI, CSCW, and ICTD has focused on technology-mediated education in under-resourced contexts [408, 10, 235, 178, 366, 206, 306]. With the progression of technology, researchers across the global north and global south have studied the design of educational technology for diverse communities [321]. These studies cover a large spectrum from designing language learning applications [181], MOOCs [264], social-robots [26, 211], virtual reality-based learning experiences [381], education applications for children in under-resource settings [321, 206] with the goal to improving the learning outcomes. The studies have covered a plethora of design techniques to explore education and technology, for example, participatory design [409, 95], cooperative inquiry [115], asset-based design [248, 58], etc. Moreover, the prior research has explored technology design to support students’ education within the classroom [10, 366] and out-of-school learning environments [284, 235]. Uchidiuno et al., [366] designed a table-based application for the school students in Tanzania and observed an increased engagement among the student in the classrooms with limited resources. In the out-of-school setups, Kam et al., [178, 180, 179] and Kumar et al., [206] designed and deployed mobile-based English language learning traditional games for the students living in the slums in rural India, which were more engaging and intuitive. These studies aimed at providing access to educational resources on low-cost devices to rural children in out-of-school settings, at locations and times that were more convenient than school.

Moreover, researchers have focused on leveraging the existing technological assets within the communities to improve the learning outputs. Cho et al. [58], in their work leveraged the existing assets within

the low-income Latinx communities by designing low-cost SMS services for families to connect students with out-of-school learning opportunities. Madio et al. [234] deployed a voice-based IVR learning system in the constrained settings in Côte d'Ivoire that aimed to foster children's literacy developments and investigated adult support as a critical anchor to improve learning among children. Similarly, to improve the learnings among the low literacy populations and resource-constrained environments, another line of research investigated the impact of learning by disseminating video-mediated education resources [111, 13, 306]. Vishwanath et al., [381] in their work detailed the role of low-cost virtual reality learning experience among the students at an under-resourced learning center. Researchers have also explored the factors such as socio-cultural values, environment, etc., which affect the design of collaborative educational applications for children [321]. The existing work within education and HCI has covered multiple dimensions and environments, although studies focused on using technology for education within conflict-affected communities need further exploration.

A common thread in most of these works is the internet requirement and, at times, smartphones. However, in our context, the internet shutdown removes the omnipresence notion of the internet and thus requires applications that remain functional without a network for a longer duration.

3.3 Research Questions

How do students, parents, and informal educational spaces support and continue education during disruption? What are the different technologies used to impart education, and how are they used during ongoing disruption?

3.4 Methodology

3.4.1 NGO: The Partner Organisation

We collaborated with CHINAR International ³⁴ to gain access to participants is located in Jammu & Kashmir, India. The NGO works with vulnerable children and marginalized youth in Kashmir through their quality education and socio-economic initiatives. They have been actively working for more than ten years with under-resourced communities in Kashmir, primarily in rural settings. Through their initiatives on im-

³<https://www.chinarinternational.org/>

⁴We would interchangeably refer CHINAR International as organisation and NGO

parting quality education, they work with 25 government schools across various districts in collaboration with DSE⁵ (Directorate of School Education). After the abrogation of section 370 in August 2019, they established Community Learning Centers (CLCs) to continue supporting the education of students during the shutdown. The organization administers 11 CLCs across seven districts —(Srinagar, Shopian, Pulwama, Budgam, Baramulla, Bandipora, and Kishtwar) of Kashmir. These centers aim to prepare students to reintegrate into formal learning environments, including academic sessions, remedial sessions, and recreational activities. The instructors at these centres are educated community members recruited directly by the NGO from within the same neighborhoods where the centres operate. They include recent graduates, part-time tutors, many of whom have personally experienced the disruptions to formal education caused by conflict. The NGO provides them with structured training and orientation in pedagogical practices, emphasizing trauma sensitivity, community-based instruction, and adaptive teaching methods suited to the challenges faced by children in protracted crisis. The community-led nature of the centres, combined with a shared understanding of the region’s instability, enables these instructors to take on multifaceted roles—beyond conventional teaching—as mentors, advisors, and trusted support figures. This fosters meaningful personal connections with students and their families, creating an environment of trust, care, and responsive learning.

3.4.2 Participants and Recruitment

We recruited our participants with the help of the NGO following purposive and snowball sampling [62] approaches. Before going into the field, we conducted multiple interactions online, and the first author conducted in-person organization visits to establish a relationship and deepen the understanding of work. Through our partner organization, we identified three community learning centers (CLC) — Srinagar, Handwara, and Kulgam, to visit and recruit participants for the interviews. We made multiple visits to the centers to recruit participants for the study. Table 3.1 represents the demographics of the organization members, parents, and teachers. Table 3.2 represents the demographic data of students.

3.4.3 Data Collection

All the interviews except with organization members were conducted face-to-face (see figure 3.1b) starting early in December of 2020 at the premises of the CLCs (see figure 3.1a). Interviews with the organization members were conducted telephonically. The interview protocol was categorized around five sets of themes

⁵<http://www.dsek.nic.in/Hill/index.html>

ID	Age	Gender	Employment Status	Education	Location
Organisation					
<i>O1</i>	29	Male	Employed	Master's	Srinagar
<i>O2</i>	35	Female	Employed	Master's	Srinagar
Teacher					
<i>T1</i>	25	Male	Employed	Graduate	Handwara
<i>T2</i>	39	Male	Employed	Graduate	Kulgam
<i>T3</i>	27	Female	Employed	Graduate	Kulgam
<i>T4</i>	24	Female	Employed	Graduate	Srinagar
Parent					
<i>P1</i>	32	Female	Homemaker	Primary	Handwara
<i>P2</i>	56	Male	Daily Wager	Primary	Handwara
<i>P3</i>	35	Male	Daily Wager	Primary	Kulgam
<i>P4</i>	46	Female	Homemaker	Primary	Srinagar

Table 3.1: Demographics of Organization, Teachers and Parents for the interview. (Abbreviation are as follow — O#: Organization Members, T#: Teacher and P#: Parent. Here '#' signifies number.) [Case Study I: Education]

ID	Age	Gender	Class	Type of School	Location
<i>S1</i>	11	Male	4th	Private	Srinagar
<i>S2</i>	10	Female	5th	Govt.	Srinagar
<i>S3</i>	11	Male	5th	Govt.	Srinagar
<i>S4</i>	11	Female	6th	Govt.	Srinagar
<i>S5</i>	14	Male	7th	Govt.	Srinagar
<i>S6</i>	11	Male	4th	Govt.	Handwara
<i>S7</i>	10	Male	5th	Govt.	Handwara
<i>S8</i>	11	Male	5th	Govt.	Handwara
<i>S9</i>	12	Female	6th	Govt.	Handwara
<i>S10</i>	11	Female	6th	Govt.	Handwara
<i>S11</i>	11	Female	5th	Govt.	Handwara

Table 3.2: Demographics of Students for the interview. (Abbreviation are as follow — S#: Student. Here '#' signifies number.) [Case Study I: Education]

— a) background and getting to know, b) the value of the CLC program, c) goals and aspirations, d) impact of disruption on the educational activities, e) usage and perception of technology for educational purposes. All the participants were first informed about the purpose of the study, were duly assured of anonymity, and written informed consent and demographics data were collected from them. For minor students (between the ages of 10-18), consent from the guardian was taken before the interview. Participation was entirely voluntary, and no compensation was given. Each interview lasted for a minimum of 15 minutes to a maximum of 90 minutes, with an average of 45 minutes. The first author conducted all the interviews in Kashmiri, Urdu, and English. The interviews were audio-recorded with prior permission using the first author's mobile device. The first author collected all the data in the form of audio notes, field notes, photographs, and video



(a) Setup of Community Learning Center



(b) An interview being conducted at one of the sites

Figure 3.1: Field settings for data collection

recordings with prior permission from the participants. Audio recordings were translated — and transcribed to English as necessary — for analysis.

3.4.4 Ethics

Prior to the study, protocols and materials were shared with the Institution Review Board (IRB), and the study was conducted with approval from the IRB committee. Special attention and care were taken while recruiting students; the first author spent some time with them at their learning center by engaging in learning and classroom activities to familiarize herself with students and vice-versa. Students were asked to address the first author as ‘*Didi*’, which is a common Kashmiri word to refer to elder sister. After receiving permission from the parent and teachers and taking assent from the student, the interviews with students were conducted. For the rest of the participants, before each interview, they were briefed about the study, the type of data being collected, and how it will be used in the future. Followed by that, verbal as well as written consent was received. Also, the organization’s name in the paper has been used with their due permission.

3.4.5 Limitations

This study was conducted in collaboration with an NGO, and the participants were recruited through purposive and snowball sampling who were associated with the community learning centers. Furthermore, due to the restrictions imposed by COVID-19 and the official closure of schools, we were unable to engage formal institutional stakeholders such as school. Their perspectives could have added more insights that

could be explored as future work. Given the thesis's broader aim to explore socio-technical interventions in such contexts, this case provides a focused but partial view of educational infrastructure. Future work should explore the long-term impact of these CLCs and other alternate educational platforms. Furthermore, the emergent, informal dimension of psychosocial support implicitly provided by CLC teachers, observed in their multifaceted roles including as 'care workers' and counselors, warrants dedicated inquiry into its contribution to holistic well-being and resilience within such contexts.

3.4.6 Data Analysis

We transcribed and analyzed 32 hours of interview recordings. Initially, the first author translated and transcribed all the interviews in English. We conducted an iterative and inductive analysis of transcripts using open coding and thematic analysis [40]. The entire research team was collectively involved in this process. To start, the first and the second author individually read and engaged in open-coding all the transcripts line-by-line and noted down their own different codes in their code list. We then clustered the codes into the first-level of codes such as — “*using YouTube for doubts in mathematics*”, “*organization helping with daily needs during disruption*”, etc based on the emerging patterns in data. Then they met each other to discuss and generate a code list. After this, they again engaged in the second iteration of open coding using the initial set of the code list. After each iteration, they met the third author to discuss the coding process and transcripts, refine codes and conceptualize themes to a higher level, such as — “*leveraging community assets*” and “*mistrust and fear with tech*”, etc. This process was followed until saturation was reached, and all the authors agreed upon all themes. During this process, the research team used tools like Miro-board⁶, Google sheets to brainstorm and construct the themes.

3.5 Findings

Through the analysis, we structured the narrative of our findings around particular themes and their sub-themes. The central themes of our findings are categorized below:

⁶<https://miro.com/>

3.5.1 Disengagement, Loss, Fear: Consequences of Disruption

“Firstly, we are left with no money”: Worsening Socio-Economic Condition

The people living in the state witness extreme socio-economic and identity-based hardships. This includes the unique challenges faced by Kashmiris, such as widespread discrimination and hostility experienced when seeking opportunities outside the region. While a comprehensive exploration of these nuances falls beyond the scope of this particular study, they represent a crucial avenue for future research. All the stakeholders whom we interviewed have faced or were currently facing these hardships. As one of the parents (P2, Male, Kulgam) who was a daily wage worker and the sole earning member in the family told us —

“Extreme hardships occur because of those strikes. Our family conditions get deteriorated — it hugely impacts our economic conditions. An individual goes out for work and earns little money for a day which, even otherwise in regular times, gets possible only after 10 or 15 days. Now, with those strikes, everything comes to a halt. There is no positive progress.”

Living with extreme socio-economic hardships directly affects the education of the children. During such situations arranging meals/groceries for survival takes priority, and education takes a back seat. We found that many families took help from NGOs working in Kashmir or the local community ties for basic necessities. As (P1, Female, Kulgam) told us —

“And, the biggest thing is we are left with no money — then his (teacher’s) elder brother (neighbor who works in NGO) at least tried to arrange grocery supplies for us like tea, oil, chili, pulses, etc. However, there is no arrangement for education.”

Consequently, this often limits the individual agency of the family members; the elders force the younger members of the family to abandon education and engage in some form of economic activity available to support their families. The NGO members also mentioned that parents are often forced to take their children to work sites and engage them in labor work as an extra hand to earn extra money. An organization member (O1, Male, Srinagar) mentioned to us —

“In the areas where we work, the children from those areas are made for sharing family responsibilities — they are made to work at their family orchards, resulting in a significant skip

in their attendance. So, if we talk about Kulgam, the laborer here charges 700-800 rupees for a day — and parents here involve their children in work to earn this amount of money...”

We also found that not only the younger generations but youths and adults are also affected and have been forced to suppress their aspirations. As a teacher (T3, Female, Handwara) told us —

“Yes! It (disruptions) affects a lot. We always have to think about the halaat (conditions) first, and then think about the work (employment). Like my cousin brother who wanted to become a driver, like driving sumo (a popular taxi vehicle), his father told him not to become a driver because ‘hartal’ happens here everyday and transportation is the first to shutdown. This would lead to a lot of loss (economical), and his father later advised him to switch to something else or prepare for competitive exams to get a job but don’t get into transportation.”

The growing socio-economic problem adversely impacts not only students’ education but also has a long-term impact on shaping their aspirations as they are routinely exposed to the economic conditions of their families.

“Some ‘groups’ may not like it?”: Embedded Fear, Trauma, and Mental Health

The politicized nature of education in Kashmir leaves parents in a critical dilemma where they are engulfed with acute fear and uncertainty from multiple dimensions. The multiplicity of fear and uncertainty among parents ranges from following the government to not offending any of the mainstream or extremist political ideologies and terrorist groups operational in the state.

On the one hand, state-imposed (mainstream government actors) curfews, communication, and internet blockage restrict educational activities [412]. On the other hand, threats from the local extremist and terrorist groups also do not let educational activities occur. The threat and fear generated by these groups are consequential [107]. Therefore, attempts to continue education and other similar initiatives often go in vain because of the embedded fear that sits among the people, where sending out their children for such activity is treated as placing the students’ lives in jeopardy. As explained by one of the teachers (T2, Female, Kulgam) —

“Parents do not support that (educational initiatives) because they fear sending their children out from home to anyone’s place. Because you don’t know, maybe some groups may not like it,

and then they think that child's life would be at risk”

It is not only the adults who foresee more profound complications and concerns to safety; such fear is also embedded into young children's minds. One of the students (S4, Male, city) explained to us —

“We are not allowed to go outside; a lot of fear and danger is associated with that. See if an encounter happens, then the whole area is at risk and danger, and our lives are also under threat and danger.”

Such embedded fear has resulted in alarming but hidden social, emotional, and mental well-being issues in people residing in those areas. The prior literature has also documented high rates of stress disorders, trauma, and depression among the communities living in conflict-affected zones [148]. Similarly, the conflict in its totality has negatively impacted people's lives on the whole, from economic to health. One of the teachers (T2, Female, Kulgam) detailed how the disruptions and disengagement from routines have affected the mental well-being of the whole population of the valley.

“Here all the residents are from the daily working class, and it gets challenging. It gets difficult to reach work because the transport facilities are unavailable. Outside movements are restricted, and that in turn makes the overall families suffer. Also, I think it has always had a negative impact. See how much it has impacted our mental health. The whole population lives in trauma and fear.”

Hence, an average individual's life is caught up in the dilemma of whether to send or not to send students for educational activities and it is the student facing the consequence of loss of education.

Embezzled Academic Infrastructure

For delivering quality education, infrastructure is an important and developing goal across various schooling systems in India. However, the unique nature (socio-geo-political) of these disruptions in Kashmir brings up new challenges in addition to the challenges faced across the educational ecosystem in India. Disruption in the educational activities is usually followed by ad-hoc decisions in examination and evaluation patterns. The curtailment of syllabus to compensate for lost time and lenient evaluation schemes have been among the most common methods. At times, students have been promoted to higher classes for a couple of consecutive

years or even declared graduates without appearing for exams or any form of assessment. However, repeated use of such ad-hoc approaches leaves parents and teachers in deep worry related to the future of the students.

One of the teachers (T1, Male, Kulgam) explained to us —

“Their daily life routines are distorted with almost no idea of future goals.”

In addition to these anomalies, as a cascading effect of postponement or cancellation of exams, the graduate dates for students have also been postponed. One of the teachers (T4, Female, Srinagar) recalled her experience —

“Being a student myself, my degree has been delayed by a year. Just because of this conflict my degree won’t get completed until 2022 which was supposed to get finished by August 2021.”

(sic)

While, there are Kashmiri students who travel to other states within and also outside India to complete their education but they also face social and economical challenges. A larger discriminating social construct and image around the Kashmiri identity brings the challenge of discrimination, as is witnessed by various students across India [267, 167, 315]. These discriminatory and hateful acts have prevented individuals from access to education outside the state, as organization member (O1, Female, Srinagar) described to us –

“[...] you see if students go for studies outside it has its impact on them there as well — because you know going outside with a “Kashmiri” tag is always a problem. Wholly and solely all of us are affected, and in that me and my generation is included too...”

Additionally, going outside (to other states) for the studies is not viable for many students because of economical reasons.

3.5.2 Community Learning Centers as Repair Infrastructure

“Now, I think I will become something”: *Continuing Education in Crisis*

The Community Learning Centers (CLC) were started after the abrogation of the Article 370 in 2019 which led to severe disruption of regular life and loss of regular education hours with a complete Internet shutdown that lasted almost a year. The organization reached out to community heads, teachers, and parents to build a safe space within the communities to continue the learning so that the students do not have to travel outside

the locality for education during the crisis. As is shared by the organization members (O1, Female, Srinagar)

—

“That time we thought to start something that is within the community where students do not have to travel too far for studies, so we were like let us do something, let us find something in the vicinity, those teachers or their elders who can at least help students in that community to continue their studies to bridge the discontinuity that is brought to their studies because of the situation.” (sic)

With the introduction of these centers, the organization is trying to overcome challenges posed by the disruption in the Kashmir valley. They successfully established an “alternative” education model where the access to education continues even during disruptions and blackouts. Their model has introduced a more personal child-teacher relationship that is often missing across govt schools [212] and it has also imparted relief and faith amongst the parents. As a mother (P1, Female, Kulgam) told us —

“Our children’s education were affected due to strikes when they were not associated with this program (CLCs), as they were completely cut off from the studies during that time”

Both the parents whom we interviewed mentioned “*positive changes*” and “*more disciplined*” as some of the most visible outcomes of sending their children to one of these centers. The teachers also pointed out key differences in terms of the students’ developed learning and intellectual abilities as witnessed across the period of 4-5 months. Increased involvement of parents such as attending parent-teacher meetings, even in remote/village areas such as Kulgam, Zampathri, etc., was often described as a “*big thing*” by the teachers. According to the teachers, the most significant accomplishment was building a strong foundation that the students did not have before. For example, teacher (T1, Male, Kulgam) told us —

“The situation is such that a student from class 6th could not perform a single-digit addition. However, now Masha Allah, if I give them a four-digit sum, they can do it. Be it multiplication, subtraction, addition, or division; now they are good at it. Before it, they did not know how to do any.”

Also, we found out that there have been multiple instances where teachers of CLCs found engaging themselves in multiple roles — as mentors, peers, and even care workers (e.g., to assist special education

needs of some students). In couple of cases, special education needs for some students were overlooked by their parents. Instead of supporting, the parents threatened and engaged in physical violence that discouraged learning pace of specially abled students. The teachers of CLC were able to identify the special needs and counsel the parents. Such examples of readiness to actively engage and assist the community have developed a strong support system for the community. The CLC model has instilled hope and faith in the minds of students and parents for nourishing aspirations. As one of the students (S6, Male, Handwara) told us —

“I like coming here to this center and by attending this place for learning, I am sure I will become something one day”

Technology as Tool for Learning

Even though there have been multiple occasions of internet shutdowns and communication blackouts in Kashmir, technology, like in any other conflict-affected context [243], has found some applications, especially for education. Youtube, WhatsApp, Telegram, and Facebook are the most commonly used applications for education and related communication. After COVID-19 lockdown, as things were moved to online space, it created a huge barrier for NGO to reach remote communities. They used available technologies like Zoom, WhatsApp, etc. to reach students who possessed smart devices and also created a telephony conference bridge for students with basic feature phones. For students who did not have any technical device available at their place, the organization tried to give them devices. Most of the teachers used their personal devices in the classroom.

As described by (O1, Female, Srinagar) —

“...now for those who have it... see we perform registrations of the students, we gather the data and collect their phone numbers and check who has internet access, who has a normal basic phone. You know when we were running RLC (Remote Learning Center) there were students who had basic phones and few had phones with access to the internet. the ones with basic button phones we used to conduct conference bridge calls for them so that teachers stay connected with them for teaching...” (sic)

Technologies such as WhatsApp are commonly used for communication between parents and teachers. Organization members mentioned receiving “at least 100-200 messages a day in groups” from parents and

students for various inquiries. The NGO also created a Whatsapp groups for all the teachers associated with their program. Initially, these groups were created for attendance checks for teachers, but soon teachers started sharing pictures and videos of various activities that they used to teach students. These instances helped the organization to enable more teachers to engage in creative activities and share them with other fellow teachers. Moreover, this exchange also led to teachers introducing technological tools such as laptops and platforms such as Youtube to teach students. Organization member (O2, Male, Srinagar) mentioned to us —

“He teaches them using a laptop, and seriously when he shares that with us — actually, we have a WhatsApp group with them and when he shares that in that group, other teachers get motivated by that. And if you will see that group, these teachers share stuff that is best in their individual capacities — because they get inspired and try to become more and more creative.”

3.5.3 Use, Perception, and (In)Accessibility: Technological Infrastructure

“My niece has big mobile, so my son used to go to her place and study”: *Sharing Devices within Families and Community*

While the NGO provided technological devices to some students, it is not feasible to provide the same to everyone due to financial and funding constraints. Hence they only provide these devices to the children whose families do not have any access to smartphones or similar devices. It was observed that the children in the family share devices with their siblings and parents, and sometimes, it results in some of the children missing classes. As explained to us by one of the students (S5, Male, Srinagar) —

“I use my father’s phone, my elder brother uses my mother’s phone, and he uses it for a longer time. My father goes to the office, and that is with me for a lesser time.”

There is also an aspiration to use these devices even if one has never interacted with one. Mainly among the children of the families, even if they do not have access, they develop such aspirations by watching other children and elders use these devices in the neighborhood. To accomplish the requirement to access these devices whenever required for educational purposes such as exams, the children and elders in the family leverage their family and community ties and reach out to their distant relatives and neighbors to seek access to these devices for education. As one of the parents explained to us (P2, Male, Kulgam) —

“Yes, the school authorities send the work on mobile phones and also teach them on those big mobile phones. However, we do not have big mobile phones, and the one I own does not support all of that. So my cousin’s brother’s daughter owns a big phone, and my elder son visits her and uses that for his learning. They study from mobile phones...”

“Phone is like a Sword”: Mistrust & Fear, Health Concerns, (Un)Intended Harms.

Using technology in this context is deeply integrated with the socio-cultural values of the families and individuals. The parents and elders in the families have strong concerns and fear about their children’s use of mobile phones (especially the internet). Their main concerns are associated with the (un)intended harms of technology being a tool that could potentially introduce children to the unsafe (insurgency) side of the technology use [122]. This fear is not merely about generic online risks, but is acutely shaped by the region’s specific history of conflict, where digital platforms have been co-opted or perceived as conduits for radicalization or anti-state narratives. As explained to us by one of the parents (P2, Male, Kulgam) —

“I think in my opinion face-to-face learning is better than mobile learning because with face-to-face learning children stick to only one place. With mobile-based learning, they get distracted in many directions, and there is no trust in these kids. They can use it for ‘other’ purposes. At least for face-to-face, there is proof that the child is at school.”

Gender and technology use have a different interplay at home, where mostly daughters are not allowed to use technology. Even if they are allowed, they have to use the device under someone’s vigilance or surveillance; for example, mothers often overlook their daughter’s phone use. Most elders and parents fear misuse by their daughters and cast doubts over technology’s ability to deliver recommendations, advertisements, or pop-ups that are believed to be “*inappropriate*” for girls and women to watch. One of the parents (P1, Female, Kulgam) compared the phone to a “*sword*” and explained to us the socio-cultural implication of girls using such devices —

“This phone is like a sword in your hands. If you can use it properly, then that’s okay; otherwise, it ruins your family, your relatives, your community, and yourself as well and you won’t be able to make any progress in life... open YouTube and make a search you’ll see there are such things which are not appropriate for a girl to watch. On Facebook also there are such things that pop

up surprisingly, which a girl should not watch... This is the reason why I do not allow my eldest daughter to use phone without my vigil because there are things on YouTube and Facebook that a girl should not be watching.”

Another concern in the mind of parents and mainly in the community’s mind is the health issue with phone use. Primarily, the elder and parents fear the growing concern of harm to the eye while using technological devices for longer duration. However, if a single incident of such harm in children is reported within the community. All the elders and parents echo it at their respective homes. As one of the teachers (T3, Female, Handwara) narrated an incident for us —

“They should not use it (mobile) more because these children are very young and it impacts their eyes. In our community, there is one girl. His father said she used to use the phone a lot, and then she had to go through an eye operation at Chandigarh one month ago. His father mentioned that she used to use the phone a lot, which impacted her eyes. From that day, all the community members here are scared and say that children should not be exposed to using phones.”

“Internet is like Oxygen”: Problem with Uncertain Internet Shutdowns.

Using technology for education is often termed as a “*necessary*” and “*useful*” tool for teachers, students, and organization members. The NGO did not have plans to use technology or the internet at their respective centers in the initial phase because of the uncertainty associated with the internet connectivity in the particular context. However, later, teachers on their own started using it to impart education to students. But the prevailing circumstance due to the context’s conflict-torn nature makes it challenging to use the technology at its best capacities. One of the prominent reasons is the uncertainty surrounding the internet. The state regulators turn down all the communication channels, especially the internet, in case of any adverse situation or even to prevent any such situations. These shutdowns are not merely technical outages; their frequent, indefinite, and unpredictable nature, often implemented as a measure of conflict control, uniquely distinguishes them from typical connectivity issues in other under-resourced settings. This usually catch them off guard and ultimately hinder their day-to-day activities (“*no phone, no WhatsApp, no zoom, no nothing!*”). Time and again, people have found these shutdowns as “*biggest hurdle,*” and this problem is deeply ingrained in their life, that they have concluded, i.e., “*this is going to exist forever*”. As one of the

organization members who compared the internet with “oxygen” (O1, Female, Srinagar) explained to us —

“The internet or other things are very important and without that it has a lot of impact on everyone. In fact leave everything all of our work suffers. If the internet at our office stops working for an hour then we face a lot of challenges because almost all of our work depends on the internet. Even for the smallest thing, say, for example, email cannot be used then. So obviously, if there are any ups and downs with the internet, it impacts us a lot. I think the internet is like oxygen for us now.” (sic)

Moreover, usually after a shutdown, the gradual restoration of the internet follows a stringent protocol as witnessed by the interviewee, only landline (telephone) connections are restored first, followed by 2G internet and slowly-slowly moving towards 3G and henceforth over the period of months at least. The extended nature of restoration results in poor connectivity and ultimately pushing students backward in their learning pace, as explained by one of the students (S3, Male, Srinagar) —

“In online classes, we are not able to understand anything. Also, the internet speed is very slow, so that adds to the process of not understanding anything. We informed the school authorities as well; they tried to make us understand. However, the next time they said that it was because of the connectivity issues, and we cannot keep repeating the same time and again. Network issues like no voice made us learn nothing. Also, learning maths is difficult because the quality of the camera was terrible.”

The suppression of aspiration (see section 5.1.1) is also influenced by access to the internet. As the internet plays a significant role in learning and accessing educational material, its shutdown often leaves students no further access to such services. Neither the students could communicate with their peers to arrange for these services if unavailable in their local community. If this inaccessibility continues for a prolonged period, the students are forced to reconsider their goals and aspirations of the future. As one of the teachers (T1, Male, Handwara) explained his ordeals with lack of internet access —

“When the situation got a little normal, I started with my preparation again; I did not purchase books again and consulted Google and YouTube. I got 68 points, and the 76 was the cut-off for qualifying... If everything had been normal, meaning the internet would have been available, I would have studied more, and I believe I would have qualified for the test...”

Missing “Context” Specific Content and Information Overload

Another barrier to the use of technology stems from the “*English*” nature of the current platforms such as YouTube, Google, etc. The children do not have a good grasp of English and face extreme difficulty in finding, learning, and understanding educational material available to them on the internet. As one of the students shared with us —

“Right now, I cannot even read Urdu that well — also I am unable to find Urdu and Kashmiri material on YouTube for help.”

In general, the educational content as per syllabus and books in Kashmir remains absent from various platforms. While students and teachers can find ‘something’ from some platforms such as YouTube, surprisingly, platforms such as DIKSHA, which the Government of India has introduced, has no content for Jammu & Kashmir in Urdu but only in English. Their design and structure makes it even more difficult for users to access such application, as explained to us by one of the organizations (O2, Male, Srinagar) members —

“I was last time logging onto DIKSHA. It’s an application, and it took more than half an hour to get registered on that application, and then when I checked, there was no content available for J&K. Also, it was so difficult to log in to that application in the first place only to realize that there was no content available for J&K. That interface is so difficult to navigate through, that is just not at all intuitive.” (sic)

Due to this, they students often end up scrolling and searching through multiple search windows. Teachers and organization members remain concerned about the younger students referring to unrelated content for their education. Hence these tasks are left for the teachers and the organization. They compile a list of resources and share it with students. Organization member (O2, Male, Srinagar) explained to us —

“I have to first open 10 applications myself and review them first. Alternatively, I have to take help from YouTube, and there are like 50 videos, and then I have to choose which video I should share with the CLC teachers so that they can get a cue from that...”

3.6 Discussion

3.6.1 Design *within* Uncertainty

One of the core insights that we draw from our findings is the prevalence of ‘*uncertainty*’ in both the infrastructures – socio-political (for example, sudden physical disruptions such as curfews) and technological (for example, indefinite internet shutdowns) in the Kashmir region. These uncertainties are deeply embedded into the infrastructure, along with the fear and helplessness in the minds of people in Kashmir. Conflict-affected regions would often have multiple underlying uncertainties, ranging from arranging basic needs to disconnected technological tools. Hence, this situation is unique, as the basic assumption of many system designs such as access to fast internet or even low-bandwidth internet is challenged every day. With these complexities and our findings, we expand our understanding of the underlying challenges with design, which is to design *within* uncertainties. It implies that researchers, policymakers, designers, engineers should either incorporate/embed uncertainties into their design or acknowledge the uncertainties beyond their design. To elaborate further, we need to either design our system/artifacts to make them operational even within uncertainties (such as internet shutdowns) or develop sensitivity and acknowledge our privileges and assumptions in our design while designing. This reflexivity would create constructive debates to better design frameworks, methodologies, and artifacts in such a situation as it would open avenues for other fields and researchers to contribute. Using either of the options may help in avoiding techno-centrism and the juxtaposition of technology within such contexts. The relationship between uncertainties and HCI is not new; prior research in HCI has addressed uncertainty. Such as – understanding uncertainty in presenting or communicating data to users in information visualization, personal informatics, end-user machine learning tools, etc. [130, 129], implication on uncertainty with using crowdsourcing systems [217], measuring uncertainty in game design [285], etc. Gries et al., [129] highlighted the need to communicate better the uncertainties of data-driven decisions to the users. Soden et al., [333, 331] suggested two modes in which HCI can treat uncertainties – a) *Generative*, i.e., it is inevitable and can be used in the design of artifacts/systems like risk communication, suspense in game design, etc. b) *Structural*, i.e., it is produced by contemporary relationships between ideology, power, and practice, as a site for questioning how the political/cultural context shapes uncertainties.

The two modes mentioned above, even though not inclusive of various uncertainties that anyone may encounter in HCI [333], embraces uncertainty and approaches it as a site of inquiry. Taking the concept of

uncertainty being ‘*generative*’ further, we are not only arguing for embracing [333] the uncertainty to better design systems but also to embed and contextualize it as a platform to design in conflict. Taking insights and learnings from Sultana et al., [343], they proposed design *within* patriarchal communities, rather than imposing our norms and tactics upon the users, as they mentioned – “*we have to work within the situation as it is*”. Drawing upon all these prior relationships between uncertainty and HCI, we propose an alternative dimension to look at this relationship, i.e., Design *within* uncertainty. We also want to emphasize the need to critically examine the design of socio-technical infrastructure, to understand the agency and ubiquity of the internet as the basis of design especially, in educational technology design. Design *within* uncertainty could help us overcome some of these challenges as it may push technological infrastructure from a necessity to an aid or a tool. However, the larger question remains how do we ‘*Design within uncertainty*’ to deliver agency back to users and operationalize tech as an aid. To this, we provide two possible design orientations that may help us design interventions to make technology more useful for our participants — a) Human-Techno Infrastructure as ‘*Disconnected Mode*’ and b) Operationalizing Libraries and Caching.

Human-Techno Infrastructure as ‘Disconnected Mode’

One of the prominent findings from our study is the strong community ties with extended families and neighbors, which are often translated into making things work during disruptions — sharing devices with neighbors, sending children in the neighborhood to study, arranging basic necessities with the help of teachers, etc. It reflects the significance of the human infrastructure, which takes foreground and technology is pushed into the background during disruptions. Hence, one of the critical resources which could be leveraged in the design is the existing human infrastructure, which has been proposed by Sambasivan and Smyth [303] as “*a human infrastructure lens to draw attention to the sociotechnical ties and linkages that constitute this infrastructure*”. It was further extended by Dye et al., [103] in their work on understanding human infrastructure to access the internet in Cuba, where they highlighted the need for “*emphasizing the community-building and long-term information infrastructure-building efforts*” to sustain the internet, which was not accessible otherwise.

We recommend that when the standalone systems fail to work within the existing infrastructure due to such uncertain events, designers should integrate ‘*disconnected mode*’ as a ‘default’ option into their socio-technical systems. For example, when students did not have access to either devices or the internet, the organization delivered hard copies of the educational content to continue education. Similarly, leveraging

and operationalizing human intermediaries along with technical systems in the design [303, 301] would be helpful to make a sustainable educational delivery ecosystem work during the disruptions. Dye et al., [103] established ‘participatory internet’, as an alternative to ensure access to ‘Cuba’s Offline Internet’ in the community. Similarly, HCI researchers, along with community members, NGOs, policymakers, and government, should investigate and enable an ecology of ‘*disconnected mode*’ to continue operations offline without the internet. This is of utmost importance as what is supposed to be the most ubiquitous technology (for example, the internet), would be the first to be brought down during socio-political adversaries⁷ [214]. Another potential solution is to leverage ‘old’ technology such as community radios and television to broadcast educational content, which has previously been implemented in various other places [361, 21], and within India as well [250, 320]. Though it is important to note that such broadcast content should not be regional but rather *local*, implying we should integrate local teachers into this network, as was done at the CLCs by the NGO to engage students better. This would provide students with options to engage with teachers of their choice, who could better foster their learning and help build their aspirations. Communities with no access to any technological device could be equipped with community learning centers that should have access to such devices. However, we understand the limitations and obstructions of power structure *within* and *outside* in implementing such design interventions, hence it is crucial to work out discussions & negotiations with various stakeholders for the same.

Operationalizing Libraries and Caching

Libraries are a storehouse of information, and while we move towards more tech-oriented libraries [16] also called e-libraries, there are still a large number of public libraries across the world. Similarly, in Kashmir, as per the official government numbers, there are a total of 72 public libraries in various districts [174] such as Srinagar, Bandipora, Kargil, etc. However, these libraries have not been adequately equipped with staff and resources to manage. For example, in Kupwara’s district library, there was “*only a single official placed to manage 32,000 books*”[161]. Avid readers and people who want to get information are often dissatisfied with such services. These libraries have significant potential, especially for students to continue their education even during disruptions, as they are located in community neighborhoods. We recommend that policymakers should – a) invest in library management and b) develop micro libraries in communities and villages. Along with policymakers, researchers from HCI, Library & Information Science, and CSCW

⁷Even at the time we are writing this paper, there is an internet blackout imposed in Kashmir

should engage in investigating and re-designing both – a) tools to manage public library infrastructure better and b) low-cost e-library resources which could be available at home. Taking insights from the recommendation on Design *within* Uncertainty (see 3.6.1) mentioned above, it is crucial to design offline e-libraries resources. For example, Encyclopedias which act as a dictionary for factual information could be one of the ways we can think of designing such offline libraries for educational content. Moreover, leveraging the human-techno infrastructure to share information, as was examined by Dye et al., [103, 104] could be an asset to enhance the capabilities of such encyclopedias (offline libraries). Similarly, two concepts – a) ‘cache’ which is defined as “*component that stores data so that future requests for that data can be served faster*” [397] and b) ‘lite mode’ in applications, which require less data to function. Both of these could be leveraged in low-bandwidth scenarios. One of the findings highlighted the slow and gradual restoration of the internet in Kashmir after disruptions. Hence, designers and researchers could leverage these concepts to design more efficient and equitable socio-technical solutions. For example, it is often difficult for individuals to move outside of their homes during disruption. Hence, people only travel out for limited needs and reasons. Designing an IVR-based information system to access public library catalogs could be one way to minimize the burden on users of traveling to multiple libraries in search of books, etc. Hence, the HCI, CSCW, and Library Science researcher should take into consideration such contexts to better design information systems that could assist in meeting educational requirements within uncertainty and conflict.

Design intervention like disconnected mode, offline library encyclopedia, caching, and lite mode would help reassign the agency of control (of aspiration, of liberties, information, etc) back into the hands of the user from the technology as well as the state. As was experienced by one of the participating teachers who could not access information (books) due to internet shutdown and was left short of a couple of points in examination to achieve his aspirations. One of the limitations to these recommendations is that education is a constant quest for knowledge, and to bind it all together into one’s ecosystem such as one proposed is practically challenging. As Freire highlights in his theory of problem-posing, that education is an act of freedom (acquiring knowledge) and hence is not static [117]. Therefore, there is need for HCI researchers and designers to constantly engage in such educational technology design challenges.

3.6.2 Infrastructuring Trust

Our findings draw on the experiences of our participants’ socio-political and socio-culturally shaped perception of using technology, with ‘trust in tech’ being one of the major elements with its usage. Our data

present a three-layered relationship between trust and perception of using mobile tech devices within the communities — scientific or health issues, socio-politically shaped safety issues, and socio-culturally shaped community expectations.

Firstly, from our findings, the participants presented their view on the scientific or health issues with the tech devices, which stems from the concerns amongst them where the technology is believed to impact the children’s eyes and overall health conditions. While there is existing literature in line with our finding that attests to technology imposing health concerns with its excessive use and increased screen time among students [97]. Our findings present one unique perspective based on the scientific concerns with the technology where one case in a community led the user going through an eye procedure. This created an atmosphere of fear and instilled a lack of trust amongst parents with the use of technology for children. While there exist solutions to mitigate these issues by incorporating blue-light filters, screen times, etc. The reception of such solutions still has not been established, primarily due to a lack of trust in technology. Hence, HCI researchers and designers need to understand such issues and devise methods to communicate such solutions within the communities. One potential solution is involving the parents and trusted intermediaries (e.g., teachers/community leaders, etc.) in the design loop to maximize the usability and acceptance of the solutions. Another solution could be to tackle this issue by involving health experts in the solution loop where they can counsel and offer a word of advice to parents and students. Workshop-based methods within communities, as also noted by Kumar et al., [207], could be helpful to mitigate the problem of embedded lack of trust in the usage of technology based on health concerns.

Secondly, given the sensitive (prone to violence) nature of the context, the parents expressed strong concerns with the technology usage among children, which were majorly influenced by the fear of mistakenly visiting or clicking websites or pop-ups related to insurgency or terrorism. According to parents, this fear and mistrust are invoked mainly with social media such as YouTube, Facebook, Twitter, etc. Prior literature has witnessed security and trust issues with the tech such as Talhouk et al., [63] where they highlight that – *“focus of the much technical security design is to distinguish between authorised and unauthorised”*. They argue for understanding the security design agenda that is *“needed to better cater to the needs of a diverse group of individuals whose threat horizon, as exemplified, is both heightened and amplified through this piece of mobile technology”*. However, in our context, which has been affected by conflict, insurgency, and terrorism for more than three decades, the threat horizon is not only heightened and amplified but also is deeper and severely consequential. Both the state and insurgent/militant groups threaten a local citi-

zen's freedom and life. For example, insurgents/militants groups have conducted deadly and ghastly attacks in Kashmir, which has costed many lives [25, 291]. On the other hand, the state, with its stringent laws which makes "bail an exception, and jail a norm" such as Unlawful Activities (Prevention) Amendment Act (UAPA), 2019 [266, 413] have been used by the state to detain critics/journalists/students. Amidst all of this a local citizen is the one who has suffered the consequences and is living a life full of fear and mistrust. Social media such as Twitter are used for provoking and influencing youth to join militant ranks in Kashmir, as Gabel et al., [122] highlighted with use of Twitter there are "*motivations of the new generation of militancy emerging in Kashmir after 1990*". Consequently, participants, especially the parents, develop mistrust and fear towards mobile technology.

Hence, HCI researchers need to engage with such a population to understand their concerns and design better security design frameworks and solutions. Talhouk et al., [63] proposed that "*freedoms that the mobile phone engenders are dynamic and require a continuous repositioning and re-balancing of prevalent security frameworks and agendas*". We recommend HCI research in our context could leverage participatory design (PD) methods, as it could provide a tool to engage the community members and appropriately design systems to gain their trust in the system. For example, PD sessions with parents and teachers to understand how they envision a safe and secure technology for their children. However, PD has its own limitation, as highlighted by Hussain et al., [155], "*(PD) do allow such methods to come closer to the community, in most practical contexts, the design is still dominated by the expert designer's belief and expertise*". To which they propose, to move towards the idea of *infrastructuring* i.e., we need to move the focus from design to community, which leverages local resources and local knowledge, reducing the chance of value intrusion.

We propose that HCI research should move towards '*infrastructuring trust*' i.e., to not only take security design to the community but also to integrate transparency and literacy of security vulnerabilities leveraging local resources and knowledge. For example, local teachers could help researchers in communicating and educating parents about features such as parental controls⁸, Kids-zone (e.g Youtube Kids⁹), etc along with potential loop-holes or vulnerabilities and their mitigation strategies. Kumar et al., [210], suggested developing privacy and security literacy in educational applications by leveraging 'teachable moments'. For example, to integrate transparency and literacy researchers could offer probes in technology to parents/students/teachers' about what would happen if they click on this pop-up or advertisement. More-

⁸https://en.wikipedia.org/wiki/Parental_controls

⁹<https://www.youtubekids.com/>

over, there is a need to develop privacy and security literacy based educational curriculum for students. As Hume's skepticism offers that the messy realities of the real world could not be measured and shaped by science and technology [154]. Hence, it is crucial for researchers, designers, and practitioners to design secure & safe systems/tools and establish & communicate transparency, vulnerabilities, and awareness regarding the same. It becomes more critical and urgent in conflict-affected contexts such as ours, where the repercussions endanger human lives.

Lastly, the mobile devices used by our participants (children) were shared within their families, as is also investigated in literature as a common practice among low-income countries [300, 45, 183, 342]. The device access and usage from our findings for the female participants are also socio-culturally shaped where the usage patterns and access to different applications are surveilled by parents. This monitoring of the technology-based usage patterns among females stems from multiple inherent contextually and culturally shaped norms. For example, technology access is gendered within communities rooting from the historically prevalent discrimination towards females, socio-cultural expectations [405], value system, and religious beliefs within communities [343, 156]. Similarly, we infer that this might also be one of the influencing factors of the embedded conservatism within the society, which has widened the gap of technology usage for females. Therefore, these monitoring mechanisms tend to control the agency of the young females by surveilling their exposure to consumption of the supposedly prohibited content and online presence on social media platforms. Parents highlighted stronger concerns with reputation and harms to families and community with technology use by girl children (see section 4.3.2).

Ibtisam et al., [156] in her work with Muslim majority communities in Pakistan, highlights that the socio-cultural and religious beliefs in communities are deeply rooted and hold operational values among the communities. These values and beliefs impact the everyday activities of the communities and advocate designing technical solutions which are value sensitive that accommodate values and beliefs into the systems. Similarly, Sultana et al., [343] in her ethnographic work with Bangladeshi Muslim women, advocated for designing *within* the context and limitations of the context for the solutions to be acceptable and usable within such communities. They argue to uphold the agency of the users rather than imposing our (researchers/designers) norms and values. While we agree with up-holding a similar approach in our context as well, at the same time, we want the researcher to focus on the more profound implications of such an approach. As there is an urgent need to reconsider our design orientation in contexts where female learners face bias and discrimination towards access and usage of mobile devices by families or communities. We

believe that in our context, it is important to reflect onto Bardzell's quality of 'Advocacy' in Feminist HCI [22], while taking into account Sultana's idea of designing '*within*'[343]. In a context such as ours, HCI research could work with a balancing advocacy with nuances of society and context. Design and researchers should look beyond the assumptions and beliefs of democratic outcomes and dialogue, while working with parents and community members. As, embracing the idea of working entirely *within* the context and upholding the preconceived notions about "misuse" of tech by females might hinder the reception of workable solutions. For example, if we can design a workable solution amidst disruptions in our context, but as cultural & religious beliefs hold strong values, the parents may not let their female child use the same. Hence, it would unfurl further significant gender-tech divide, leading to loss of education specifically amongst female learners. As Covid-19, with the global emergence of technology based-education, has also brought a much deeper gender-tech divide, especially with regards to female education [305].

Hence as put forward by Bardzell [22], the designer must be aware of '*Ecology*' in which they are designing, how it (tech) is going to be affected and how it (tech) is going to affect the stakeholders. Multiple potential solutions can be developed to overcome the concerns posed by the parents in our context, such as designing an application that does not allow children to access other applications which parents believe the child may misuse, etc. However, the reception of such applications should not be enforced; rather, it should be infrastructured within communities by leveraging intermediaries [405, 348], such as teachers and organizations working on the ground. For example, applications along with parental control and Kids-zone could incorporate tags which describe type of content (example, images, audio, etc), e.g., basketball, scooter, vegetables, etc. Such applications should also incorporate a feedback loop from teachers and parents, so that any content or example which is not appropriate could be changed. All such design strategies should be communicated (not enforced) to parents by teachers or other intermediaries. Karusala et al., [184] suggested using Whatsapp to communicate gender equity values using careful multimedia selection. Future HCI research could leverage such a solution in our context as well, teachers can communicate to parents and promote the use of features such as content-tagging, app-locks, etc instead of snatching access to education applications. Moreover, teachers have a strong personal connection, relationship, and relatability with parents. Therefore, they could better engage in putting forward the case for allowing their children to use such applications, even if that requires their vigilance because the educational solutions should not fall prey to the cultural & religious biases and end up excluding the female learners (or any group) from the educational landscape.

If the design of the system falls prey to such socio-cultural challenges, researchers and designers should

altogether reconsider even to design a solution for the same, as it can further deepen the ordeal upon the disadvantaged users [22, 343]. Furthermore, researchers and designers need to consider a middle route to workaround context-aware, culturally acceptable, and inclusive solutions within the communities.

3.6.3 Education Content Usability

Our findings demonstrate major barriers to accessing good quality education content. The students reported language, i.e., English, as a barrier, and the teachers reported a lack of means/medium to access the relevant material conveniently. Despite the growth of technology in the education sector and a plethora of education material available, our findings show that the eventual usability is still a challenge (see section 4.3). ‘English-as-a-barrier’ with technology use has previously been highlighted in the HCI, CSCW, and Social Science research [363, 264, 184]. Prior research has highlighted the importance of designing and delivering the content in local languages [177, 352]. Karusala et al., [184] proposed the need to design “*online content repositories with a more sympathetic view of those not fluent in English*”. In our context, we recommend that the HCI researcher and designer could leverage the existing human infrastructure, such as local teachers. For example, CLCs recruited local teachers from the community, and they helped bridge the gap as they could access the available content (in English) and yet explain in the local language. Familiarity with language (not only limited to spoken) is one of the foundational requirements to establish a ‘*dialogue*’ between a student-teacher and teacher-student [128]. As Paul Freire [117] argued, engaging in ‘*dialogue*’ among a teacher-student and vice-versa establishes a critical learning environment. Relationships and relatability with the students’ context have a significant impact on students’ learning environment [128]. More than filling the language gap, the local teachers would also help bring the ‘trust’ as we learned that there is a general deficit of trust between authorities and the local population because of prevailing conditions (see section 4.1). The local teachers, who are already trusted within the community, play an essential role in *infrastructuring trust*. The students and parents find it easy to form a bond with them. Moreover, engagement of local teachers also accounts for cultural sensitivity, e.g., parents reporting concerns on material suitable for girls or not (see section 4.3.2), as they come from the same culture and may help assuage the unfounded fears of parents. Beyond their educational roles, these teachers, acting as ‘care workers’ and counselors for parents, implicitly provided informal psychosocial support, contributing to students’ and parents’ holistic well-being and resilience within the community. This emergent dimension warrants further exploration in future work. Therefore, we believe that engaging local people as part of a solution could be very effective in a context

like Kashmir. The HCI interventions need to involve the local people. Engagement of local teachers will also provide resilience against the internet shutdown and keep a channel of education open.

The second major barrier reported was difficulty in finding usable educational content [296]. The teachers reported spending hours on public platforms like YouTube to find helpful content. The Youtube platform was also popular with students and NGO members. YouTube provides all its content for free. However, given the amount of content available there, it is overwhelming to find usable content (see section 4.2.2). There have been attempts to provide solutions for curating the content of Youtube, e.g., VideoKen. Using the VideoKen software, one can create an index of the YouTube Video, thus finding the content within a video directly without watching the entire video. However, it currently works only for Videos in English and is also a paid service. Prior work in HCI by Anderson et al., [13], explored the potential of Digital Study Hall (DSH) – video-supported learning in resource-constrained schools in India. Drawing inspiration from such existing work, we recommend that HCI research could involve the experienced teachers at CLCs to generate the locally relevant video-supported educational repository, and then the same could be disseminated across various other CLCs. The other good repository of Educational Content is Khan Academy which is completely free and provides curated content. However, in a hyper-local context, the curation needs to be as per the local school/board requirements. Different commercial ventures have also become prominent recently and claim to deliver curated educational content for multiple state boards in India [49, 377, 358]. Though being run on profit models, applications are often monetized and have also been found engaging in predatory tactics [329, 20]. Their marketing and sales tactics often profile students based on pervasive profiling, which are used to lure parents and students into opting for such applications [329]. This has attracted multiple complaints of people being duped by such applications, especially the parents and students from a low-income background, who are pushed to take a loan and work overtime, to afford subscriptions to such applications [329, 20].

Moreover, there is a need to support off-line search and access to relevant content and provide it at a low cost. Therefore, there is a need for HCI research to explore contextual computing tools that provide searching and curating relevant content easier using public resources like YouTube or Khan Academy and could also work without continuous internet connectivity. The teachers also used WhatsApp to collaborate among themselves. They used WhatsApp for sharing material, discussing teaching practices, and so on. The easy interface and ubiquity of WhatsApp facilitate collaboration. The network requirements of WhatsApp are also minimal. However, there is a need to sustain the conversations and preserve the resources

shared on WhatsApp for a sustainable solution. The computing tools should also facilitate easy collaboration among different stakeholders with means to preserve resources shared during communication. Also, recently the Govt. of India has launched a new Education Platform named DIKSHA¹⁰ (means delivering education/knowledge/skill). The DIKSHA platform aims to provide content in local languages across India. However, the platform is still under development, and content for Kashmir is only available in English so far, as was also highlighted by our participant (see section 4.3.4). Furthermore, the portal's navigation is not easy and requires one to have prior technology exposure for searching the right content. While such initiatives are commended, the need is to develop tools that can augment local teachers in creating their own list of curated education content that they can share with students and among each other.

Closing Reflection: In summary, this study shows how educational access in Kashmir is maintained through informal, community-led infrastructures during periods of systemic breakdown. The analysis highlights infrastructural improvisation, trust-building, and adaptation as key themes, contributing to an understanding of both the vulnerabilities and forms of resilience that shape education in conflict-affected regions. These findings speak directly to RQ1 and RQ2 by mapping the relationship between disruption, infrastructure, and everyday learning practices. This chapter laid the groundwork by examining how education is disrupted and locally repaired in conflict regions like Kashmir. The next chapter builds on this by examining how such disruptions also affect youth employment opportunities and career pathways.

¹⁰<https://diksha.gov.in/>

Chapter 4

Case Study II: Employment

Asra Sakeen Wani, Ishika Joshi, and Pushpendra Singh. (2024). "Navigating the Job-Seeking Journey: Challenges and Opportunities for Digital Employment Support in Kashmir." *Proceedings of the ACM on Human-Computer Interaction* 8, no. CSCW1 (2024): 1-28.

CHAPTER 4

CASE STUDY II: EMPLOYMENT

4.1 Introduction

The issue of youth employment is of significant concern to societies globally. This issue has garnered attention from governments worldwide, including the United Nations (UN), through the Sustainable Development Goals (SDGs). More specifically, the UN's SDG 8 aims to “promote sustained, inclusive, and sustainable economic growth, productive growth, and decent work for all” [116]. There have been various initiatives, policies, and efforts to improve employment and job-seeking opportunities, including the use of technology. In recent times technology has played a role in supporting job search interventions, helping job seekers to enhance their employability and secure employment. However, despite these efforts, concerns about youth unemployment persist in many regions, including India, where poor infrastructure and rigid labor laws are among the contributing factors [159, 158, 251, 76, 67] to the problem. In addition to these issues, the challenges related to employment and job-seeking become even more pronounced due to the unique context-specific issues present in areas facing ongoing political unrest.

The Jammu & Kashmir (J&K) region, specifically Kashmir, is one such region that has been experiencing ongoing prolonged socio-political and armed conflicts for over three decades¹, causing significant disruptions in various aspects of life, such as education, economy, and employment opportunities [393, 74, 163, 389]. The persistent political unrest has resulted in high unemployment rates due to extended strikes, curfews, and internet shutdowns [354, 105]. Both educated and uneducated youth in J&K face limited job prospects and economic hardships. As of March 2022, J&K had the second-highest unemployment rate in India at 25%, three times the national average [61, 316]. Furthermore, the COVID-19 pandemic has further exacerbated the employment situation in Kashmir [17].

Chapter Overview: This chapter presents Case Study II, focusing on the complex landscape of youth employment in conflict-affected regions. It responds directly to Research Questions 1, 2, and 3 by investigating how socio-political conflict impacts job-seeking processes and how youth navigate systemic infrastructural challenges. The study explores the resources and mentorship available, detailing the workarounds employed,

¹[https://en.wikipedia.org/wiki/Jammu_and_Kashmir_\(state\)](https://en.wikipedia.org/wiki/Jammu_and_Kashmir_(state))

and analyzing the role of technological interventions in supporting these practices amidst ongoing adversity.

4.2 Employment and HCI

Employment has been an imperative area of study in HCI scholarship. Job seeking is defined as a self-regulatory process, involving proactive and goal-driven actions to secure desired quality jobs [382]. It encompasses various activities such as exploring career domains, searching for opportunities, pitching capabilities, gathering information, meeting prerequisites (e.g., resumes, training), applying for jobs, and securing recommendations/referrals [38, 223]. These activities have been studied from multiple perspectives to investigate how technology can enhance job-seeking processes [53]. Dillahunt et al. identified various contextual factors that impact the job-seeking journey of an individual. These factors include social resources (mentorship, social networks), societal factors (community, government, access to amenities), and personal factors (interpersonal skills, values). [89]. Prior literature has covered many of these factors to recognize existing challenges faced by job seekers. Job seekers from disadvantaged backgrounds with limited resources have been observed to face significant challenges when it comes to job searching and securing employment. It was seen that economically distressed individuals face difficulties in social networking which limits job-seeking opportunities [85]. Woelfer et al. highlighted the vulnerability of homeless young people and the need to provide aid for their personal development [398]. Low-resourced job seekers also have limited exposure to technology, and current technology designs are not efficient enough to improve the job searching skills of job seekers and maximize their chances of finding suitable employment [395]. There are various examples and studies on how the lack of digital exposure and training lands individuals like vocational technicians [350], returning citizens [270] and veterans and refugees [312] in a heavy disadvantage when looking for jobs since the job-seeking process has been largely digitized. Various studies have also tried to mitigate the problem by developing solutions and providing recommendations that can support job searching processes of disadvantaged job seekers.

Medhi et al. tried to implement a system to help connect low-income domestic workers from an urban slum with potential middle-class employers in India. The study highlighted the need to build interpersonal skills and development of digital literacy among low-income workers [245]. Korn et al. also tried to understand the nature of work experienced by impaired workers and the impact of gamification on their job experiences [199]. Moreover, online and offline mentorship has emerged as a key factor boosting the em-

ployability of individuals [120, 367, 91] of a job seeker. Dillahunt et al. found that preparatory platforms like Massive Open Online Courses (MOOCs) empower job seekers and enhance their adaptability [94]. External support and assistance through social media [224, 42, 322] and employment centers [87] have also been critically analyzed and studied as potential tools to foster job search processes. Burke et al. studied the use of the social media platform Facebook by individuals who recently lost their jobs [46]. Social networking on Facebook influenced job seekers' mental well-being and offered social support and employment opportunities. Communication platforms also connect new workers with services like babysitting, carpentry, transportation, and offer opportunities for individuals with limited job experience. [85]. Online QnA forums have also come up as a medium to provide online mentorship, information, and encouragement [355]. Other solutions in the forms of accessible crowd work engines [166, 135, 293], shared economy [93], and various digital tools and applications to support low resource job seekers [24, 349] have been previously studied and suggested in the HCI scholarship. Uniform platforms have been established to simplify the recruitment process for job seekers and employers. Many companies find that transitioning to online employment processes is a cost-effective alternative to traditional recruiting methods. [86, 89]. Companies are seeking employees using sites such as LinkedIn, Glassdoor, etc. to find talent [86]. Numerous studies have examined the compatibility of these platforms with job seekers in different contexts and have consistently highlighted usability challenges and their inaccessibility and unavailability experienced by low resource users, including onboarding ease, feedback nature, impact on self-efficacy, and empowerment of job seekers [89, 90, 223, 173, 94]. This study explores job-seeking challenges and opportunities in the context of conflict-affected Kashmir, filling a research gap in the HCI literature regarding job-seeking in socio-politically conflicted regions.

4.3 Research Questions

How do the existing infrastructure offer support to the youth in the job-seeking process? What are the resources/mentorship available, and how are technological interventions supporting these practices?

4.4 Methodology

For this work, we conducted an interview study with participants in Kashmir to understand their practices in preparing, finding, and securing employment. All the research materials and protocols for this study were

reviewed and approved by our Institute's Review Board committee (IRB). Our study took place in Kashmir from mid-April 2022 through June 2022. We present in detail the steps of our methods below —

4.4.1 Participant Recruitment and Data Collection

In this study, we engaged in purposive [357] and snowball [138] sampling methods. All the participants were recruited using online mediums, including social media platforms such as Twitter, Instagram, Facebook, WhatsApp, and Telegram. The recruitment process involved posting a recruitment survey with information about the study and sharing it on the first author's social media accounts and with personal contacts and groups to gauge prospective interview participants. The posts were shared across all the social media handles of the first author because the majority of the contacts were Kashmiris in the author's contact list. The recruited participants were also requested to share the post as their stories on social media and within their know circles. In the recruitment survey, we asked participants for their age, gender, the highest level of education attained, employment status, current location, consent for participating in the study, and the feasible mode of communication for conducting the interview. We used the following inclusion criteria for recruitment - i) 18+ years old and a Kashmiri, ii) looking for a job, or iii) having secured a job recently (\leq three years). We established the first criteria to attract participants from the Kashmir region. The second and third criteria were established to understand the experiences of the youth, their practices, processes, use of resources, mentorship availed, and technology used throughout the journey from seeking a job to securing one. We received 41 responses from the recruitment survey. We contacted all 41 participants through emails, calls, and text messages. Of these, only 21 participants reverted to us for the interview.

We conducted 21 semi-structured interviews with the prospective participants who responded to our follow-up communication. Table 4.1 presents the detailed demographics of our participants. The first author traveled to Jammu & Kashmir to conduct the interviews. The interviews were conducted online and in person, given the participants' mode of preference. The interview protocol was categorized around five sets of themes — a) background and getting to know, b) understanding the formal and informal educational institutions' role in training and skill building, c) understanding the practices, mentorship gained, and resources used, and d) understanding the use of technology, media practices, various platforms used e) understanding the future expectations with technology and design opportunities. All the participants were informed about the purpose of the study and were duly assured of anonymity, and verbal consent was collected from them. Participation was voluntary, and participants were compensated for their time and valuable responses after

Participant No.	Age	Gender	Educational Background	Employment Status	Location
P1	21	Male	Undergraduate	Looking for job	Srinagar
P2	24	Male	Undergraduate	Have already secured a job	Srinagar
P3	24	Female	Undergraduate	Looking for job	Srinagar
P4	25	Female	Post-graduation	Have already secured a job	Srinagar
P5	28	Female	Post-graduation	Have already secured a job	Srinagar
P6	26	Male	Post-graduation	Have already secured a job	Anantnag
P7	27	Male	Post-graduation	Looking for job	Budgam
P8	27	Male	Undergraduate	Have already secured a job	Srinagar
P9	25	Male	Post-graduation	Looking for job	Srinagar
P10	29	Male	Post-graduation	Looking for job	Srinagar
P11	27	Female	Post-graduation	Have already secured a job	Anantnag
P12	28	Female	Post-graduation	Looking for job	Pulawama
P13	30	Female	Post-graduation	Looking for job	Pulawama
P14	27	Female	Post-graduation	Have already secured a job	Pulawama
P15	25	Male	Post-graduation	Looking for job	Pulawama
P16	32	Female	Post-graduation	Have already secured a job	Anantnag
P17	28	Female	Post-graduation	Looking for job	Srinagar
P18	25	Female	Undergraduate	Looking for job	Budgam
P19	28	Male	Post-graduation	Looking for job	Srinagar
P20	25	Male	Undergraduate	Have already secured a job	Srinagar
P21	25	Male	Undergraduate	Looking for job	Srinagar

Table 4.1: Demographics of the participants for the interview. Abbreviation is as follows — P#: Participant where ‘#’ signifies number. [Case Study II: Employment]

completing the interview. For online participation, we compensated the participants with INR 300 (\$3.75) and INR 500 (\$ 6.25) for in-person interviews for their time and to offset the travel expenses. Out of 21 interviews, 17 were conducted in online mode, either telephonically, via Zoom, or Google Meet, as per the participant’s preference. The rest of the four interviews were conducted face to face at a neutral place feasible as per the preference of the participant. Each interview lasted from a minimum of 35 minutes to a maximum of 120 minutes. The first author conducted all the interviews in Kashmiri, Urdu, and English. The interviews were recorded with prior permission using the first author’s recording devices. The first author collected all the data in audio notes, field notes, photographs, and video recordings with prior permission from the participants. Audio recordings were translated — and transcribed to English as necessary — for analysis.

4.4.2 Data Analysis

For this study, the research team transcribed and analyzed 36 hours of interview recordings using open coding and thematic analysis. The first two authors initially transcribed all the interviews in English and engaged in open coding, and thematic analysis [40] of the transcripts. The entire research team was collectively involved in this process. To start, the first two authors individually read and engaged in open-coding

all the transcripts line-by-line and noted down their own different codes in their code list. The team then clustered the codes into the first level and met to discuss and generate a code list such as — “*lack of guidance and mentorship*”, “*reliance on social ties and peer networks*”, etc., based on the emerging patterns in data. After this, they again engaged in the second iteration of open coding using the initial set of the code list. After each iteration, they met the third author to discuss the coding process and transcripts, refine codes and conceptualize themes to a higher level, such as — “*functional capabilities of existing infrastructure*” and “*caring in non-normative circumstances via offline & online mediums*”, etc. They repeated this process of open coding and code refinement until saturation was reached, with the third author joining the meetings to assist in the conceptualization of themes. To facilitate this process, the research team utilized tools such as Miro-board² and Google sheets for brainstorming and theme construction.

4.4.3 Study Limitations

We acknowledge the limitations of our study, and we discuss the same here. This study recruited the participants online through purposive and snowball sampling. Our sample included participants with access to technology and higher levels of education. We were unable to include populations with lower literacy levels or severely limited technology access, who may have qualitatively different employment-seeking experiences in Kashmir. Thus we do not extrapolate any generalized conclusions from our research. Future research can extend this work by examining a broader range of experiences across class, education, and gender to better inform inclusive employment-support infrastructures in such regions. Despite the limitations of our work, we emphasize that identifying and addressing these struggles and challenges of such sensitive contexts will help us progress toward solving the difficulties of such vulnerable groups.

4.5 Findings

In this study, we offer a contextual overview of the existing infrastructural support and the impediments faced by our participants throughout the job-seeking journey. We then unpack the nuanced practices of bridging the gaps in the infrastructure through peers and social networks. Finally, we discuss how technology shapes the job-seeking experience in this non-normative context.

²<https://miro.com/>

4.5.1 Functional Capabilities of Existing Infrastructure

Limited institutional support, guidance, mentorship, and career development

The conflict-ridden complex socio-political nature of the Kashmir region has significantly burdened academic infrastructure. Our analysis revealed that one of the most frequently reported issues is the outdated teaching practices and curricula employed at colleges and universities. All participants emphasized the lack of hands-on, skill-based training and learning opportunities at the postsecondary level. Our findings demonstrate that contextual complexities, such as lockdowns and internet shutdowns, have led to detrimental outcomes for students, including limited access to resources, shortened academic calendars, compromised learning quality, and reduced academic sessions. These findings are consistent with the work by Wani et al., [389] on Kashmir. Our participants mentioned that these factors ultimately hinder an individual's ability to achieve promising career prospects, as they are left with inadequate skills and knowledge. A recurrent theme identified in the data was the perception among all participants that the primary focus of educational institutions in Kashmir is on conferring degrees and adhering to traditional methods of rote learning, passing the exams, grades, and academic achievements rather than providing a strong foundation of practical knowledge and the necessary skills, or exposure to current industry trends. This emphasis on grades and exam performance was perceived to have a negative impact on individuals' ability to acquire technical job skills and the knowledge required to excel in their respective fields. As one participant stated —

"The system of education we have here, our learning is based on the passing of an examination and garnering marks and grades." - (P5, Female, Employed)

A common structure within higher education institutions in India, such as placement cells, serves the primary function of facilitating the employment of graduating students. Our analysis revealed that while it is common for colleges and universities in India to have established dedicated placement cells to facilitate the employment of graduating students, such resources are primarily absent in Kashmir. Our participants reported a lack of placement cells or support in their institutions. However, they believed in the potential role these placement cells could play in their career advancement, where these cells could actively establish relationships with potential employers and organize recruitment activities, including job fairs and campus interviews, to connect students with job opportunities. Along with offering career counseling, guidance, and assistance in resume building and interview preparation. However, participants mentioned that their insti-

tutes made minimal efforts toward organizing campus placements. They spoke about these minimal efforts, often being ad-hoc and selective in their recruitment process. As one participant shared —

“The process was discriminatory as they would only inform some students selectively about these programs” - (P3, Female, Looking for a job)

Our participants also reported a lack of guidance and mentorship from colleges and universities regarding future career choices after graduation. Some mentioned that contextual factors, such as the instability and uneven internet situation, exacerbated this issue. Many participants described a lack of institutional support at the early stages of their education, such as encouraging students to engage in quality internships to gain real-world experience and skills, as well as at the completion of their degree. This has created the impression among participants that their career prospects are determined by chances of luck making it seem more like a ‘game of fate’ and ‘destiny’ to them, rather than being informed and strategic decisions. As one participant explained —

“There is no such concept (mentorship or guidance) here in colleges either offline where someone will guide you if you have completed a particular degree that you should look into a particular field or you are eligible for a certain type of job or you should apply to a certain place. We don’t have any such programs here neither have I attended any such and nor am I aware of any.” - (P13, Female, Looking for a job)

In summary, the educational infrastructure in Kashmir is facing challenges due to the prevalence of outdated teaching methods and curriculum, a lack of practical, skill-based training, and insufficient support for students’ career prospects, which is further compounded by the unstable and inconsistent internet access.

Resource Centralization and Mobility considerations

Our participants expressed concerns about accessing offline resources and spaces to compensate for lost learning opportunities due to mobility limitations imposed by security situations in the form of lockdown or curfew. The participants spoke about the challenges faced by the centralization of resources, such as libraries, present only in the major city of the region, such as, Srinagar district, has resulted in a lack of access to quality informational resources for those living in other areas. One participant shared that during lockdowns, when internet access and other formal spaces become unavailable, individuals may rely on

offline resources, such as libraries, to make up for lost learning opportunities. However, the concentration of these resources in Srinagar presents a barrier to access. The participant explained that the centralization of resources and lack of access to them could be particularly detrimental during lockdown situations where mobility of individuals is limited within the region. As described by a participant —

“In Kashmir, every major thing is concentrated and centered around Srinagar, and this is where we are lacking in other districts” - (P7, Male, Looking for a job)

Our finding identified that the security situation in certain regions, e.g., southern districts of Kashmir, is more problematic than in other regions leading students from those areas relocating temporarily relocating to other states in order to access tuition and training. We identified that security concerns in some regions of southern districts requires lights to be turned off at night after a specific time, creating difficulties for students in terms of studying or accessing education resources. Our finding reveals that such serious situations in certain areas of Kashmir may be a contributing factor to students’ decisions to move out of those areas in order to access education and have an impact on individuals’ daily lives and access to education in the region. As is explained by a participant —

“Southern districts have more problems than other districts (central district); there, they cannot keep their lights turned on after a specific time at night (due to security reasons). This is why you will see more students moving out from southern districts.” - (P7, Male, Looking for a job)

Many participants expressed apprehensions about relocating and moving out of the region, citing a range of issues, including family responsibilities, social concerns, and security issues within the state. We identified a strong resistance among individuals to seeking employment outside of the region or moving and staying outside the region for an extended period of time. These concerns are attributed to the socio-political factors in the region lead to prioritizing safety over career advancement. Thus causing reluctance to seek employment outside of the region due to concerns about discrimination, harassment, and hate crimes. Our participants also expressed concerns about the risks of mobility and security associated with group gatherings in Kashmir. They spoke the importance of group studies in acquiring knowledge and securing employment. We identified that individuals in Kashmir might be hesitant to engage in group activities or stay in someone else’s home for an extended period of time due to security concerns and a persistent atmosphere of fear and tension in the region. Affecting individuals’ willingness to participate in group activities or spend time in

unfamiliar environments. This may have implications for students' access to education and opportunities for social interaction and support. As a participant explained —

“Mostly the kind of situation that is going on for the past 2 to 3 years in Kashmir, my parents would not want me to go outside and work because they would always be worried about and in a state where they would be thinking we don't know whats happening there with him and this kind of feeling runs in every parent whose kid is studying outside.” - (P15, Male, Looking for job)

In summary, the security concerns in certain specific regions of Kashmir impede access to education, resources, and mobility. Thus leading to lost learning opportunities, difficulty in studying and accessing educational resources, reluctance to relocate and seek employment, and reluctance to engage in group activities.

Existing Employment Ecosystem

Many individuals in India prefer government jobs over private-sector employment due to factors such as perceived stability and security. This preference is not unique to India and is common in our context as well. We found that societal conditioning and the perceived benefits of government employment being key factors in the preference for government jobs in our context. We observed that an additional preference for government jobs in our context was seen as critical for attaining stability in the face of uncertainty. However, participants also reported challenges securing government employment, including a lack of job vacancies lengthy, and often problematic recruitment process. The participants talked about the job posts being fewer than the applicants applying for the posts. They spoke about the government's recruitment processes being time-consuming, where mostly the recruitment lists or the selection list of the candidates land into long-pending judiciary issues. They talked about numerous institutions been accused of irregularities and disparities in their operating mechanism, and thus most recruitment processes landing in courtrooms. Due to various factors, it often takes years for a single competitive exam procedure to conclude, making many candidates overage and ineligible for future examinations. A participant gave the example of how the J&K service selection board (JKSSB) had announced hiring Naib Tehsildar and Patwari positions for the 2015–2016 academic year. The final recruitment list is still awaiting as the hiring procedure for the position of Naib Tehsildar has not been finished as of yet. The protracted procedural delay has left thousands of

applicants in a miserable and uncertain position. A participant further explained this —

“Here the government opportunities are very less and students are more...Maximum job exams results and lists are stuck in court cases. I think more problems are because of Kashmir’s judicial intervention after the introduction of CAT. All the exams are on hold and a few selections are due there are a lot of issues because of this. These are wasting a lot of time. Three of our exams got postponed due to a stay order from the court.” - (P7, Male, Looking for job)

In addition to the preference for government employment, our observations also revealed concerns about seeking employment in the private sector. In our context, the lack of an established industrial sector and the absence of an Information Technology (IT) industry estate in the region were identified as significant barriers to private-sector employment. Participants shared that opportunities in the private sector were also limited, and the compensation offered were often insufficient to meet basic needs. Moreover, seeking employment in the private sector outside of the region was also found to be challenging, due in part to the limited representation of Kashmiri individuals in private firms and the perceived difficulties faced by graduates of tier 2 or tier 3 colleges in the region in securing employment with top tech industrial firms. They spoke about graduating from tier 2 or tier 3 colleges in Kashmir, preventing students from getting recruited into the top tech industrial firms outside of Kashmir. Participants also reported a lack of presentation and communication skills impeding their recruiting in private companies. As a participant mentioned —

“I interacted with them, then they called me. And they told me that you have a Kashmir accent in your English speaking language and its evident, so the first step would be to correct your accent.” - (P9, Male, Looking for job)

Hence, the limited employment opportunities has resulted in individuals taking up any available job, regardless of their degrees, specializations, or skills. This trend has led to the uptake of asymmetric employment, in which individuals are working in roles that do not align with their education or expertise. In addition, female participants reported a lack of opportunities and a perceived unsafe and male-dominated work environment in the private sector in the region, thereby posing additional challenges and barriers to women’s employment. As one participant mentioned —

“We don’t apply for private jobs because here there are no private jobs. Also, there is no private sector available here that is also safe for females. For example, in my area, there are a lot of

industries in Lassipora, but only males work there. There in those industries females don't work and that's why females don't apply and work for private industries here.” - (P13, Female, Looking for a job)

In summary, we unpack that individuals in this context have a strong preference for government employment due to its perceived stability and security. But they face challenges in securing government jobs and limited opportunities in the private sector, particularly for women.

4.5.2 Stitching the Infrastructural gaps in non-normative circumstances

Reliance on social ties and peer networks

Our analysis highlights how the existing infrastructural challenges are mitigated by Kashmiri job seekers. Caring and communicating in the community through peer groups and social networks came up as a form of resilience that Kashmiri job seekers have established. The lack of adequate guidance in the job-seeking process is addressed by college seniors and alumni helping young aspirants. Moreover, as a gesture of care, many seniors or experienced practitioners also reach out to help their juniors in order to share their experiences and knowledge. Participants also talked about obtaining referrals from social connections, such as seniors, as a medium of securing a job. Many believe that referrals give an ‘edge’ to the job seeker and enhance their chances of getting in. Through social connections that can provide a referral to an aspirant, the process of obtaining a job gets easier. As was mentioned by a participant —

“If there is a person sitting before you who has already worked in a job you are aspiring for and they guide you so that will make your path easier than just hit and trial methods so this is where seniors came to our rescue.” - (P9, Male, Looking for a job)

Dependence on more personal ties such as friends and batchmates also aids in navigating through the job-seeking process as reported by many. Participants talked about dependence on friends and batch mates to stay informed about job postings and job training material to make up for the limited aid provided by the universities and colleges. Through social networks, information about the various technological platforms that can be leveraged is also shared. This traversal of information supports many job seekers to navigate through their job-seeking journey. As explained by a participant —

“As I said, a placement cell was missing, so I totally relied on friends’ circles. There were some people who are working, and they were recommending me something, and I applied and followed what they were saying most of the time.” - (P9, Male, Looking for a job)

To summarise, job seekers in Kashmir have been relying on informal social connections and networks such as peers and college seniors for assistance in the job-seeking process, including informal mentorship, information about job opportunities and training material, and obtaining referrals. Through this, they mitigate infrastructural challenges and navigate the job-seeking journey.

Leveraging online platforms

Technological platforms designed to ease the job-seeking processes are also commonly leveraged and made use of by all participants. Government websites are a common source of authentic official information regarding government job openings as mentioned by many participants. LinkedIn, Glassdoor, and naukri.com are some job-seeking platforms that most participants were familiar with or had used. These are also used to know about various private job openings and stay informed about the different industry roles available. Some participants also used google search for job openings. As mentioned by a participant —

“I have been looking for a job via the social media platforms primarily LinkedIn and Glassdoor.” - (P1, Male, Looking for a job)

Social media applications like Facebook and Instagram are commonly used mediums for obtaining or sharing information about job openings. We analyzed that targeted advertisements or pop-ups on these platforms bring forward job opportunities for the users looking for them. Participants talked about joining various groups and pages on these platforms that are specific to sharing information related to job-seeking. Through Facebook, various coaching institutes also share preparation material and tips that deem useful to those with limited access to coaching classes. Participants also mentioned shifting from older sources of information like newspapers to social media platforms like Facebook for information regarding job postings. A participant mentioned —

“In these times, it’s more of Facebook and Instagram where you get to know more about everything than offline resources. In current times nobody checks newspapers that often because you

get everything from your phone and investing in newspapers isn't seen of many advantages" -
(P13, Female, Looking for a job)

Communication channels made on WhatsApp and Telegram came up as effective platforms to share information about job opportunities among peers and communities of similar interests in our findings. Many shared their experiences of exchanging preparation material and resources like question banks in large numbers through these channels. Teachers, students, and aspirants of common interests connect, communicate, and share essential resources through these platforms. A participant explained —

"Telegram is also used a lot – telegram groups are helpful in extracting a lot of information and newspapers are less in use." - (P7, Male, Looking for a job)

Numerous participants explained YouTube and online learning platforms such as Coursera, Udemy, Unacademy, etc. as regularly used platforms to prepare for job interviews and examinations. These platforms are commonly used by job aspirants to up-skill themselves and resolve doubts by watching online videos or referring to the provided study material. Participants spoke about the wide range of benefits in the form of information and resources available on these platforms, the ease of learning, skill building at their own pace, and the options of pausing and revisiting a concept through recorded lectures. Google search is also referred to for seeking preparation resources. Participants mentioned localized applications made by Kashmiris that also offer curated material to prepare for government exams. A participant talked about their use of YouTube

—
"Like I wanted to learn more about networking and then searched on YouTube, I came across Coursera. From where I did some basic courses to get started." - (P4, Female, Employed)

Social media is also a medium to aid in generating income. Participants talked about the potential of social media platforms as a tool for creating employment opportunities. For instance, our participants shared how people on social media platforms are engaging in running small businesses or startups, like selling clothes or more, and generating employment opportunities for themselves. As described by a participant below –

"Because of social media, a lot of people are simultaneously studying and involved in small businesses or startups. Many Kashmiri people are studying, and also through Instagram they are doing businesses like selling clothes through Instagram pages, and people see that and purchase through them." - (P17, Female, Looking for a job)

Overall, the aspiring job-seeking population uses various technological platforms, social media apps, communication channels, and online learning platforms to stay informed about job opportunities, prepare for interviews and exams, receive and share information and potentially generate income through small businesses and startups.

4.5.3 Challenges, Constraints, and Opportunities of Technological Platforms and Resources

Constraints and Challenges in the Use of Technological Platforms and Resources

Our observations so far revealed that participants faced challenges related to infrastructural support, including contextual complexities and inadequate institutional training. Despite these challenges, participants reported ways in which they mitigated these issues informally and by using various technological platforms. However, our observations indicate that participants experienced several constraints while using technological platforms to meet their needs. One notable constraint was the non-ubiquitous and unpredictable nature of internet connectivity, which hindered timely access to information and resources. These findings align with those of Wani et al. [389], who also identified a contextually well-accepted and embedded notion among the population that technology-based platforms and resources should not be completely relied upon. As explained by a participant —

“The situations here are not normal as the internet here is not available every time. A student here cannot completely depend on the internet because sometimes the internet is shut down for 72 hours, 48 hours, or even more.” - (P13, Female, Looking for a job)

We identified issues of accessibility and usability encountered by the participants with these technological platforms and tools. Our participants demonstrated variable gaps in their overall literacy and awareness of technology-enabled platforms and resources for preparation and job seeking. For instance, many participants were unaware of the existence of various job-seeking platforms. However, among those who were aware of these platforms, some reported difficulties in understanding how they functioned, such as not knowing how to apply for a job or search for job opportunities. In addition, participants expressed dissatisfaction with the search results provided by these platforms, which they perceived as presenting asymmetrical and mismatched job opportunities based on individuals skills. For example, participants with specific specializations and skills often found that job profiles presented to them through these platforms did not align with their qualifications. Additionally, participants mentioned constraints imposed by platform policies, such as

limitations on the number of emails sent through an account or the requirement to pay for premium services to access certain features to facilitate effective utilization of technology-enabled platforms for job-seeking. As explained by a participant —

“Initially, the idea of messaging the CEO of a company would really overwhelm so that would be a big challenge. Also platform like LinkedIn , there is a limit to how many mails you can send to someone so that was another challenge for me. So paying for premium was another thing” - (P8, Male, Employed)

In addition, our observations indicate that participants had mixed experiences when searching for jobs and resources through social media platforms. Some participants reported that these platforms were time-consuming and distracting, while others expressed concerns about the authenticity of the information and resources related to job opportunities they found on these platforms. Participants also mentioned their apprehensions and lack of trust in the authenticity of the information and resources on these platforms related to job opportunities. For example, one participant shared that she had created a LinkedIn account and started the process of applying for a job through the platform but ultimately abandoned the application due to fears that the job posting and application form might be fraudulent and deleted her LinkedIn account instead. Participants also mentioned encountering fake information on social media platforms, which made it difficult for them to trust the authenticity of posts. A participant described this experience as follows —

“There are random fake posts like 400 vacancies for J&K, 300 vacancies for J&K, and then sometimes they are fake, and they are also shared by people. And that’s the challenge also that is there with this social media.” - (P13, Female, Looking for a job)

Apart from the issues mentioned above, we also identified the struggles that participants experienced with the information and resources available on digital platforms. Participants reported issues with information overload and repetitive content on these platforms. They mentioned the difficulty of filtering through the vast amounts of information and resources to find what was relevant to their needs. Participants also described how the resources offered through various preparation and skill-building platforms were often designed with different assumptions about prior knowledge, making it difficult for them to utilize these resources effectively. For example, one participant explained that a course offered on Coursera did not cover many

basic concepts from an Indian perspective but assumed that students already had a certain level of prior knowledge. A participant stated —

“Like a course on signal processing there are a lot of things but they are not covering it from Indian perspective. Indian Engineering education is not that good so they assume that we already know that but most of the students don’t have an idea so I think these things. Maybe not an all courses but in some courses. There is a course on machine learning their also they are assuming that you know most of the things but from Indian perspective you don’t have that understanding.” - (P9, Male, Looking for a job)

In summary, we observed that participants experienced various constraints and challenges when utilizing technological platforms and resources. Such as issues with internet connectivity, lack of trust in the reliability of platforms, gaps in literacy and awareness, time-consuming and distracting social media platforms, information overload and repetitive content, and mismatched resources.

Insights from Participants’ Desires and Requirements

The study participants reported shortcomings in the technological platforms they used for job searching and identified specific features they would like to see implemented. These needs suggest design opportunities for making these platforms more user-friendly and context-aware. One common theme that emerged was the desire for a more robust feedback system, including features such as analysis of uploaded resumes or feedback on rejected resumes. This would allow job seekers to understand their current standing better and make necessary improvements. One participant provided further insight on this topic, stating that —

“I think something is when you apply somewhere but you do not get a feedback so it should be necessary that if you apply some way to LinkedIn you will get a feedback on why you are getting rejected so push those companies which list themselves on LinkedIn they should give a feedback.” - (P9, Male, Looking for job)

Several participants discussed the idea of automated CV generation or built-in tutorials for teaching job seekers how to create effective resumes or profiles. They noted that it could be time-consuming for new aspirants to learn what is necessary for a successful CV or LinkedIn profile and to become familiar with the process of seeking employment online. Providing training through these platforms could therefore help to

streamline the process and reduce the learning curve for job seekers. This was supported by a participant who reported —

“There should be a lot of things like how to create a CV and if i google there should be such courses or training that would teach how to create a CV for different job applications” - (P17, Female, Looking for job)

The participants also reported facing challenges regarding recommendations or job posts that were not aligned with their skills. They also noted that some companies filter students based on the tier of their college, resulting in job posts that may not be relevant to certain job seekers and are, therefore, time-consuming to sift through. To address this issue, many participants suggested incorporating better filtering algorithms and adding signs or disclaimers to inform job seekers about the potential misalignment of search results. A participant provided further insight stating —

“I think there can be a disclaimer which can tell that there is a chance that your job might not match your skill.” - (P15, Male, Looking for job)

Participants also discussed about their lack of familiarity with the interfaces of many job-seeking platforms, which hindered their ability to navigate these platforms efficiently. They highlighted the need for more tutorials, pop-ups, coach marks, etc. to help them become accustomed to the interface in a guided manner. The need for guidance in making efficient use of these platforms was a common theme among the participants. As one participant stated —

“I think these platforms can bring more tutorials. As soon as a land on a website it should be clear through some messages that tell me how to use it. There could be coach marks. Tutorials can annotate every component of the website. It will have them filter out things. That will really help new comers to the website.” - (P8, Male, Employed)

The participants also emphasized the importance of contextualizing the content they consume according to their specific needs and preferences. One participant mentioned political posts on LinkedIn and expressed a desire for job-seeking platforms to regulate content or provide users with the option to choose what type of content they see. Other participants discussed the need to introduce more courses on job preparation platforms that align with their skills and background. As an example, one participant mentioned —

“I feel more courses need to be added for people with Intermediate knowledge of a particular topic as I am of the opinion that courses on these platforms generally cater to only the Beginners trying to learn a new skill” - (P2, Male, Employed)

Overall, in summary, the participants highlighted various shortcomings in the technological platforms they used for job-searching. Expressing desire for features such as a more robust feedback system, automated CV generation, built-in tutorials, better filtering algorithms, guidance on navigating the interface, content regulation, and courses that align with their skills and background.

4.6 Discussion

Our data brings to the fore the job-seeking journey of individuals coming from a context of prolonged socio-political crisis prevailing in Kashmir. Our findings highlighted significant limitations in the career support provided by the region’s formal institutional (e.g., universities and colleges) structures. These limitations manifest in various forms, such as a lack of access to resources, skill-based training, and mentorship support. Additionally, our findings uncover the challenges faced by the users of existing technology platforms built to support the job-seeking process in our context. With this, our study highlights the need for the HCI community to adopt a contextualized approach to developing employment support tools for Kashmiri youth. Our discussion informs implications for taking a tailored approach to address the specific challenges and opportunities of the region to enhance the existing employment for job seekers.

While many challenges faced by youth in job-seeking, such as reliance on informal social networks and gaps in digital literacy, resonate with studies in other Global South contexts, the protracted socio-political realities in Kashmir introduces distinct layers of complexity. Unlike many regions, the unpredictable internet shutdowns, coupled with specific forms of discrimination faced by Kashmiris outside the region, amplify mobility constraints and undermine trust in formal employment channels. This particular confluence of factors, therefore, necessitates a uniquely tailored approach to employment support that acknowledges and designs for these compounded vulnerabilities.

4.6.1 Designing for Career Advancement and Employment Support

Our investigation unpacks that institutional infrastructures (e.g., universities and colleges) present two main obstacles in facilitating employment support. Firstly, our data reveals the need for practical and skill-based

training, mentorship, and guidance offered by educational institutions at the college and university level. These deficiencies pose a significant challenge for students seeking to enter the workforce, resulting in high levels of unemployment and underemployment. Secondly, our data presents the need for more institutional support for career development, specifically in the form of placement cells and internships, which have been identified as a limitation for students transitioning out of college into the job sector or higher education. Studies in HCI and CSCW scholarships have identified the relationship between career development and technology from various perspectives, e.g., the importance of virtual mentoring and online guidance in facilitating career development [356, 314], the potential of technology-mediated communication to support mentorship and guidance in educational settings [92], tools for job search [88], support for team collaboration [54], productivity in the workplace [241], among others in varied contexts. While implementing these solutions can be effective in our context, but it is crucial for any solution to adequately consider the specific cultural, political and social landscape of Kashmir. The norms and expectations of solutions in our setting differ from other geographies. And we acknowledge that implementing these remote solutions in Kashmir will raise design challenges due to the added complexity of unreliable internet. Nevertheless, it becomes important for our context to take advantage of internet access opportunities on periods of availability for educational and employment purposes. Despite the challenges, implementing technology solutions for advancing the educational and employment services in Kashmir must not be disregarded. Moreover, designing in this context means that the design systems should focus on scaffolding and strengthening the capacities and capabilities of the institutions needed to succeed in careers. Therefore, our findings bring to the fore that institutions need to develop solutions tailored to the region's needs by leveraging remote resources where they can compensate for their inadequacies through borrowing and collaborating from other regions and places to harness the potential benefits for the region fully.

Addressing the lack of mentorship and guidance could mean that institutions could bridge the gap of inadequacy in their infrastructure by exploring various ways of finding opportunities for arranging and implementing remote and virtual mentorship initiatives for their students. The institutes can collaborate with bodies from outside the region and among the regional institutes, increasing mentor visibility and availability. Through tools for bringing virtual mentoring and guidance sessions for their students and partnering with professionals in relevant fields to provide students with career advice and opportunities. Institutions can engage in design practices for co-creating and co-designing the resource materials that can enhance the hands-on skills of their students by collaborating and taking the expertise from the outside institutes and

engaging in that loop the various stakeholder (e.g., students, alumni, and various local organizations) from within the context such mentorship and guidance developed are tailored to cater to the needs of the youth. Designers and practitioners can explore designing platforms that allow individuals to sign up as mentors or mentees while considering the contextual complexities and capabilities. These platforms can explore embedding provisions like a curated database of mentors along with features like a matching program that can allow pairing students with mentors or experienced professionals in their field of interest. Options for virtual meetings and check-ins, accessible communication and scheduling between mentor-mentee pairs, as well as tracking of goals and progress can further ease the process of seeking and providing guidance. For pushing the need for leveraging technological advancements in our setting, we also draw from Bardzell's Feminist HCI [22] framework to foster advocacy in the design and implementation of government initiatives e.g., virtual mentors model like "*Desh Ke Mentor*³" to be enabled for Kashmiri aspirants also. We recognize the potential for pushing boundaries while acknowledging that technology can play a significant role in enhancing career opportunities in our context and striking a balance between the advantages and limitations of design solutions to achieve successful outcomes. Based on the learnings from our analysis, we saw that our participants also talked about their need for an adequate skill set and competent hands-on experience in the job markets. To alleviate these limitations, institutions should direct their efforts toward engaging students in taking advantage of the opportunities offered that institutions in other parts of the country avail and need to be added in our context. This could be done by developing partnerships with other institutions to offer virtual access to their resources and opportunities, such as online lectures, workshops, and research projects. Technology platforms like Zoom, Skype, and other online meeting tools to facilitate virtual access to resources and opportunities such as seminars and workshops can be made available to aspiring students.

Secondly, where the acquisition of internships typically in metropolitan cities or state capitals is facilitated through an established industry sector which offers greater ease for institutions or students in arranging and securing internships. However, we saw that this phenomenon is exacerbated in our region, which significantly lacks an established local industrial history because of the prevailing situation. This lack of industry infrastructure thus hinders institutes from arranging opportunities for aspiring students. Moreover, we saw from our findings that mobility restrictions in the region limit the internship and employment opportunities for individuals by limiting their ability to seek job opportunities outside of the region. Cultural factors, social factors, and socio-political considerations lead to prioritizing safety over career advancement, caus-

³<https://deshkementor.com/>

ing reluctance to seek employment outside of the region due to the concerns of discrimination, harassment, and hate crimes. It becomes important for institutes to explore and identify opportunities that offer remote internships to aspiring students in various fields of interest within the local geographic area. To offer support, institutions should direct efforts toward identifying and reaching out to companies and organizations to partner for availing remote and virtual internship opportunities. Institutions should also focus on working with local businesses and organizations to create student internship opportunities to provide students with hands-on experience in their chosen fields and networking opportunities, and exposure to the real-world working environment. Researchers and developers can also explore designing and developing localized platforms that can have a curated database of remote or local authentic internship opportunities and make them available to students. Local businesses and organizations can post their recruitment requirements on these platforms. Additionally, such platforms can be used by institutions to ease the process of collaborating with viable organizations and connecting students with possible internships. Existing AI-built tools can further present internship opportunities to a user based on their skill set. Based on students' level, these platforms can be designed in ways where it can offer targeted guidance, personalized advice, and support to them for advancing their careers.

Further, these resources and opportunities can be made widely available to aspirants through social media platforms. As we observed from our data that almost all of our participants leveraged social media platforms for employment support through various volunteer groups on WhatsApp and Telegram or following pages on Facebook for exchanging information, and educational resources, staying updated on various job opportunities, or availing mentorship from peers. We observed that most of the support on these groups and platforms was found to be unstructured. The affordances of these platforms can be leveraged in a structured manner, which has already been found useful in various domains [404, 187]. Institutions and organizations can use these platforms to create and maintain specific separate groups that can be used to share verified information and resources, connect students with mentors who work in the same field, provide career advice and guidance, promote job and internship opportunities, and provide information regarding career development events. These spaces can also be used to share short, visually appealing career advice or mentorship tips, success stories, and experiences of people within the communities to inspire others and build community.

4.6.2 Designing for Decentralized Resources and Employment Support in Mobility-Restricted Environments

Our observations reveal that events like internet shutdowns or curfews disrupt the functioning of schools and colleges and restrict individuals' mobility along with their access to resources within the region. We further unpack that during lockdowns, internet access and other formal spaces become unavailable. Due to mobility limitations, our data highlights the centralization of offline resources, specifically libraries, in the region's major city leads to limited access to quality information sources for individuals residing in other areas. In regions where physical mobility is restricted due to any terrorist event, it is a known phenomenon that internet access will be restricted or shut down for days. Moreover, our observations also identified mobility and security concerns as even more prevalent and consequential in certain regions. For instance, we saw in our findings that the socio-political sensitivity towards a particular region, e.g., southern districts is more, as we saw in our findings that there existed a regional need to turn off lights at night for security reasons, creating difficulties for studying or accessing education resources.

Thus, it becomes crucial for HCI researchers, practitioners, and policymakers to advocate for technology design that ensures accessibility, security, and culture catering to the needs and perspectives of the people living there. This calls for rethinking the ways of designing decentralized technology for providing access to resources. As Wani et al.,[389] advocate to design within uncertainties, in our setting this becomes essential that any solutions designed or implemented must be attuned to the function in a state of limited or absent internet connectivity. The design should prioritize offline functionality and not rely on continuous access to the internet as a parameter. The operationalization of decentralizing resources can be done through various methods by taking inspiration from the literature, e.g., focusing on establishing resource centers or libraries in underserved areas and promoting mobile libraries, and other applications while using technology to make resources more accessible remotely. For example, one possible way to decentralize educational and employment-based resources and deliver them to aspiring people can be tailoring the design of a Kolibri⁴ platform for employment support in Kashmir. It is an open-source offline learning platform that delivers educational content to individuals without internet access. A key component of the design process should involve local stakeholders and partners in developing and implementing the solution to ensure that it is relevant and responsive to the specific needs and context of the region. The design of the platform should explore features that are specifically based on users' preference and details the specific skill sets required

⁴<https://learningequality.org/kolibri/>

or in demand in the job market. Based on this, the platform should support training on specific software or technical skills and information on job searching and interview techniques. These solutions should be made available in local languages to make them more accessible to the population. The platform design should also feature downloading and saving resources to allow users to download content for offline use. They could also include features such as bookmarking, highlighting or creating custom playlists, which can help users quickly find and access the materials they need. The platforms should run file compressing techniques or offer different versions of the same resources optimized for different internet speeds or device storage capacities. The design solution should include a feature for users to save and track their progress and goals.

Another good example could be exploring and implementing the replication and adaption of the project Mishtu [1] for decentralizing the delivery of resources related to education and employment in our context to assuage security concerns with government authorities. This can be implemented by identifying trusted intermediaries such as NGOs, organizations, universities, and colleges that can be made as hubs. Such devices can be deployed in these verified trusted intermediaries where data usage can be monitored. Typically, any terrorist incident follows an internet shutdown imposed by the government to curb the misuse of the internet during that time. Hence, these devices can help during such times when they are deployed in particular institutions where data usage is limited to educational purposes.

4.6.3 Incorporating Contextual Nuances in Existing Technical Platforms

Our findings demonstrate the existing relationships between Kashmiri job seekers and technical platforms for preparation and job searching. The job-seekers are using preparatory platforms, like Coursera or Youtube, for compensating the gaps left by inadequate training that they receive at their Alma mater or learning the latest skills that make them employable. Similarly, they use job search platforms like LinkedIn or other social media platforms to search for jobs. Our findings highlight that the use of these platforms by Kashmiri job seekers often involved struggles and challenges. This has largely impaired the extent to which job seekers are able to avail these platforms and the ease they experience in interacting with them. This calls for attention in a context of variable and uncertain access to online resources. Most of the job-seekers in Kashmir do not have continued access to online resources given the internet shutdowns and otherwise inadequate infrastructure, therefore not allowing them to use these platforms on a regular basis. As a result, job-seekers find it difficult to overcome the nuances that they encounter while using these systems, for example, not being able to seek an appropriate job. However, this also points to the inadequate design of available plat-

forms which fails the purpose of designing technologies to aid job-seeking processes as they do not fit the background and needs of job seekers. Therefore, we recognize the need to mitigate these challenges in existing technologies in order to minimize the struggles encountered by job seekers hailing from nonnormative contexts like that of Kashmir.

Bridging the gap between Job Seekers and Technology Our findings highlight various challenges that surface in the use of job-seeking technology by job seekers in Kashmir. Many of these challenges are a result of the contradictions in the nature of support Kashmiri job seekers require and the nature of aid provided by existing technologies. We saw that many job seekers in Kashmir remain unaware of available technology platforms that could potentially support their job-seeking process. Many job seekers mentioned having accessed these platforms a few times but proceeded with giving up on exploring them any further. There were numerous reasons reported for the same. The inability to navigate through current technology design came up as a key challenge. Various participants found it difficult to perform activities such as choosing appropriate training courses, building an effective resume and online profile, searching for relevant jobs, and utilizing social networking features on job searching platforms without any training or point of reference.

For upskilling, the participants tried to register for courses and learn new technologies, however, at times they found it too difficult to complete them. Users could not easily find suitable courses at a level where they could progressively get better at a subject or learn a skill. Today, multiple learning platforms are available which offer multiple courses to attain real-world skills. However, the algorithms deployed on these platforms rarely take into account the actual present capabilities of the users before showing them a list of courses that they can take. Kashmiri job seekers come from a broken education system where they have received inadequate training which makes it difficult to complete and learn from advanced courses. Similar challenges were found when candidates were searching for jobs. They often found job advertisements that asked for a higher skill set than what the candidates had leading to disappointment and distrust. Some participants mentioned that they could not understand why they were not selected for the jobs even when they met the requirement. Presenting personal performance feedback can also help the user become aware of the under-explored aspects of the platforms, helping them engage efficiently. Pop-ups asking whether job suggestions or study material suggestions are useful can help job seekers customize their user experience, which can further also be incentivized to get more users to provide feedback [113]. Inefficient filtering of job suggestions or study material suggestions also leaves job seekers confused and unable to proceed with

the information overload and repetitive recommendations suggested by the algorithms of these platforms. The algorithm mismatch needs to be addressed through better design to accommodate users from different backgrounds to use them effectively. The inability to navigate through digital platforms can be catered to by building interfaces that train the user to use them. We suggest the incorporation of platform-specific tutorials without assuming the background of the users. Ogbannay et al. [270] previously suggested the incorporation of tutorials that can convey basic mental models of the specific platform to introduce practical skills and guided understanding among users. Moreover, interesting visual tutorials [160, 190, 141], community enhanced tutorials [213] or interactions like videos [261, 23, 227], pop-ups, coach marks, etc. can be tailored for platforms to teach users the nuances of using them. There is also a need to segregate search results according to their relevance to the user to avoid information overload or repetitive content and better guide the user in terms of which suggestions to prefer.

Our findings also highlight the unequal preferences given to job candidates based on the ratings and quality (commonly known as *tier*) of their colleges. However, many reported that job-seeking platforms such as LinkedIn do not take this into account and provide all kinds of job openings to all applicants. This lowers the chances of getting recruited to these openings, resulting in failed attempts and demotivation. Moreover, various job-seeking platforms now allow users to create posts and share their thoughts. This has resulted in various irrelevant information being offered to job seekers, like political posts that might provoke uncomfortable feelings, especially among job seekers going through socio-political crises. The challenges highlight the need to design algorithms that do not harm the user experience of job seekers or leave a detrimental impact on the ones trying to leverage these technologies. Hence, there remain various contextual nuances yet to be considered in the design of technology for supporting job seekers.

Weaving Trust and Security towards Technology Our findings also uncover instances of fraud and cheating experienced by users of platforms that aid their job-seeking processes such as Instagram, Facebook, Google search, etc. Targeted advertisements on social media platforms offer various possible job opportunities to users who are looking for jobs. However, instances of these opportunities being unauthentic or offering demotivating experiences to users have been reported in our findings. Agendas such as fake information and targetted advertisements have been priorly studied in HCI and CSCW scholarship [318, 112, 238]. However, the context of Kashmir offers a unique situation where users of these platforms come from an already vulnerable and sensitive background, such experiences can impact them severely and result

in hesitation in relying on technology for job searching as a whole. Moreover, a cultural preference for government jobs makes them even more vulnerable to falling for scams⁵.

As was also seen in our findings, where a participant saw both LinkedIn and Google search as similar and authentic modes of job search platforms, whereas LinkedIn verifies the job postings it suggests, while the same is majorly absent from Google Search. Spam Job postings on social media also result in disheartening experiences for those who are unable to judge the authenticity of these posts. While there is a greater acceptance among social media platforms about the role their platforms play in communicating wrong or fake information, there is much to be desired in the verification of the content that they offer. A recent news report⁶ in India indicated how youths across India were duped of money in an offer of a government job. HCI and CSCW communities have taken research about fake information [372, 140] in different domains. However, fake information and scams about job offerings and advertisements are still under-explored. Technologies need to be carefully designed and tested in sensitive contexts like that of Kashmir. Concepts like that of targeted advertisements need to be given special attention. Personalization of advertisements cannot come at the expense of violation of vulnerable users by inauthentic elements. Social media platforms like Instagram and Facebook that incorporate such elements need to implement authenticity checks of businesses that engage in recruiting employees through them. Credibility indicators [308, 407, 33] or fraud detectors [344] on advertisements can better guide the users. Shahid et al. recommended the use of visible and transparent reporting feature options to report fake videos on social media platforms [318]. Such options to report certain job offers as spam can also help other users and modify the algorithms owing to crowd-sourced authenticity. More so, social media platforms can provide context-specific disclaimers or tutorials to educate users against possible scams. Strict content regulation policies with active actions taken against scammers are needed to be implemented in order to reduce the chances of scams in the first place.

Prior Human-computer interaction (HCI) and Computer Supported Cooperative Work (CSCW) literature suggest certain methodologies to mitigate some of the challenges such as lack of digital training and unfamiliarity with algorithms in low-literate or low-resource backgrounds [270, 106, 109, 121, 383, 336]. The context of Kashmir remains different as our findings suggest that most participants have access to and literacy in using technical platforms, but they still face struggles in navigating through the platforms. Thus,

⁵<https://www.livemint.com/news/india/railway-job-scam-28-unemployed-youth-duped-of-over-rs-2-5-crore-in-delhi-11671507500380.html>

⁶<https://www.livemint.com/news/india/railway-job-scam-28-unemployed-youth-duped-of-over-rs-2-5-crore-in-delhi-11671507500380.html>

more research is needed and our work contributes towards it. These insights into employment repair illuminate how infrastructures are actively reconfigured in times of uncertainty.

Closing Reflection: In summary, this study highlights the infrastructural limitations and mobility constraints that characterize the job-seeking journey for youth in this context. It reveals how individuals 'stitch infrastructural gaps' through reliance on social ties, peer networks, and strategic leveraging of online platforms. While technology offers opportunities, findings underscore challenges related to unpredictable internet, usability issues, and concerns around information authenticity. This study contributes to RQ1 and RQ2 by detailing the impact of conflict on employment and how individuals utilize diverse resources. Furthermore, it addresses RQ3 by offering socio-technical design recommendations for career advancement, decentralized support, and incorporating contextual nuances in employment platforms for conflict-affected environments.

Building on this, the next chapter explores how skill-based entrepreneurial training becomes another route through which individuals—especially women—navigate disrupted livelihoods in Kashmir.

Chapter 5

Case Study III: Skill-Based Entrepreneurial Training

Asra Sakeen Wani and Pushpendra Singh. (2025). Understanding the Role of Community Training Centers on Skill-Based Entrepreneurial Training Among Women in Kashmir. In Companion Proceedings of the 2025 ACM International Conference on Supporting Group Work, 2025. pg(1-14).

CHAPTER 5

CASE STUDY III: SKILL-BASED ENTREPRENEURIAL TRAINING

5.1 Introduction

Women historically have been subjected to gender inequality in the labor market, limiting their access to diverse employment opportunities. The United Nations Sustainable Development Goals (SDGs), specifically Goal 5, aims to achieve gender equality and empower women, emphasizing economic mobility, leadership integration, and decision-making inclusion [258]. Despite women's growing importance in the global workforce, those from Lower middle-income countries (LMICs) encounter challenges impeding full participation [84, 124]. Numerous national and local initiatives, policies, and efforts, leveraging technology, aim to empower women and improve skill-building, economic mobility, and employment opportunities [5, 379]. In India, women encounter significant challenges in their integration into the labor market and economic mobility [394, 176]. According to a report by the International Labour Organization (ILO), only 23.6% of women in India participate in the labor force, highlighting a substantial gender gap [269]. Persistent wage disparities [37, 48], societal norms and gender stereotypes [172, 44], workplace harassment [143, 230, 295], limited access to training and networks [31, 244], and constrained pathways to leadership roles contribute to hurdles hindering women's integration into the workforce and impeding economic advancement. However, these challenges intensify in conflict-affected areas, where prevailing socio-political, economic, and cultural norms further restrict women's economic participation.

In the Kashmir region, decades of political instability and systemic disruption have had a cascading impact on developmental domains, particularly those affecting women's participation in education, employment, and entrepreneurship [389, 388, 163, 354]. These disruptions and challenges disproportionately affect women's empowerment in the labor market and economic mobility. Female labor force participation in Jammu and Kashmir is low, according to Directorate of Economics & Statistics (DES), J&K [265] data. Rather than being isolated to individual or household-level barriers, women's restricted access to economic resources is shaped by broader infrastructural breakdowns and sociopolitical constraints [134, 192]. Limited access to education due to security concerns, societal norms reinforcing traditional gender roles, and constraints on mobility have collectively contributed to low female labor force participation [290]. The im-

pect of conflict also exacerbates economic challenges, making it difficult for women to access employment opportunities and engage in entrepreneurial activities.

Chapter Overview: This chapter responds directly to Research Questions 1, 2, and 3. It investigates how Community Training Centers (CTCs) influence women’s engagement in entrepreneurial ventures through skill development programs. It focuses on the ways women navigate socio-political constraints and gendered expectations through informal networks, offline infrastructures, and cultural knowledge. The study highlights how entrepreneurial practices are not only shaped by material and digital conditions but also by social norms and community dynamics.

5.2 Research Questions

How do Community Training Centers (CTCs) influence the experiences and motivations of women to engage in entrepreneurial ventures through skill-based training programs? What challenges and social stigmas do these women encounter, and how do CTCs help to overcome them? How does technological infrastructure help them in shape their everyday practices towards the skill based entrepreneurial ventures?

5.3 Methodology

This study is approved by the Institute review board (IRB) at our institution in Delhi, India. Our study took place in Kashmir from February-April 2023 in collaboration with an NGO (name anonymous for review) working for women’s empowerment through skill-building initiatives. We next describe our participant recruitment criteria, study methods, and data analysis approach in detail below —

5.3.1 Participants Recruitment and Data Collection

To recruit participants, we partnered with an NGO — HELP Foundation¹ in Jammu & Kashmir, India, dedicated to women’s empowerment for over two decades. The NGO operates two community training centers in Srinagar, providing skill-based training, focusing on vocations such as tailoring, stitching, traditional crafts work like carpet weaving, sozni work, and the production of organic spices, juices, jams, and pickles. The training centers serves as therapy centers for women to share experiences and as platforms for skill development. Our collaboration with the NGO facilitated access to women participating in their skill development

¹<https://helpfoundationjk.com/>

programs. These programs are designed by the NGO to empower vulnerable women in the community, and participants are typically selected based on their interest in skill acquisition and socio-economic vulnerability within the region, ensuring the study captured the experiences of those directly benefiting from such initiatives. To this, we employed purposive and snowball sampling [62] approach to recruit participants for our study. Prior to fieldwork, online interactions and in-person visits to both the skill development centers were conducted by the first author to establish rapport and gain a deeper understanding of the organization’s work. Then the subsequent visits to the centers were made for participant recruitment, and we conducted 15 semi-structured interviews with women engaged in the organization’s skill development programs. Detailed demographic information of the participants is presented in Table 5.1.

Participant No.	Age	Education	Training Category	CTC Location
P1	21	Graduation	Stitching and tailoring	Aali Kadal
P2	18	11th	Stitching and tailoring	Aali Kadal
P3	21	Graduation	Stitching and tailoring	Aali Kadal
P4	22	Graduation	Stitching and tailoring	Aali Kadal
P5	29	Post Graduation	Stitching and tailoring	Aali Kadal
P6	23	Graduation	Stitching and tailoring	Aali Kadal
P7	27	Graduation	Stitching and tailoring	Aali Kadal
P8	23	9th	Stitching and tailoring	Batpora
P9	31	Post Graduation	Stitching and tailoring	Batpora
P10	28	12th	Stitching and tailoring	Batpora
P11	30	Post Graduation	Stitching and tailoring	Batpora
P12	24	Graduation	Stitching and tailoring	Batpora
P13	27	Graduation	Stitching and tailoring	Batpora
P14	22	Graduation	Stitching and tailoring	Batpora
P15	25	Graduation	Stitching and tailoring	Batpora

Table 5.1: Demographics of the participants for the interview. [Case Study III: Skill-based Entrepreneurship]

All the interviews were conducted in person at two skill development centers of the organization. The participants were asked question around their background, their perception around the value of the skill development program, aspirations, business environment, and technology use for skill development and entrepreneurship endeavours. All the participants were informed about the study’s purpose, assured of anonymity, and provided verbal consent. Participation was entirely voluntary, and no compensation was given. Each interview lasted for a minimum of 15 minutes to a maximum of 90 minutes, were conducted by the first author in Kashmiri, Urdu, and English. The interviews were audio-recorded with prior permission. The author collected all the data in the form of audio notes, field notes, photographs, and video recordings with prior permission from the participants. Audio recordings were translated — and transcribed to English as necessary — for analysis.

5.3.2 Data Analysis

We transcribed and analyzed 21 hours of interview recordings. Initially, the first author translated and transcribed all interviews into English. Using open coding and thematic analysis [41], the first author conducted an iterative and inductive analysis, reading and engaging in line-by-line open coding, noting down codes in a list. The two authors then met, discussed, and clustered the first-level codes based on emerging patterns, generating codes such as — “*gender stereotypes and societal expectations*”, “*financial independence as a motivation*”, “*learning through social media platforms*” etc. This process was iterated, with the authors meeting to refine codes, conceptualize higher-level themes like — “*women’s struggles: interplay of socio-cultural influences*” and “*navigating technology: usage, perception and challenges*”, etc. This process was followed until saturation was reached, and both the authors agreed upon all themes. Tools such as Miro-board² and Google Sheets were employed for brainstorming and theme construction.

5.3.3 Study Limitation

We acknowledge several limitations of this study and discuss them in this section. Our recruitment focused solely on women currently enrolled in training at a specific center, resulting in a lack of diversity in the data presented. This approach excludes the perspectives of successful graduates from those centers who have transitioned into entrepreneurship. For this work, we also did not include the viewpoints of the training instructors or the organizational members managing these centers. We recognize the importance of these stakeholders and acknowledge that their diverse experiences and viewpoints would provide a richer understanding of the skill-building process. Future work could expand this inquiry by incorporating multiple training models and examining infrastructural support for women’s entrepreneurship from both learner and institutional perspectives.

5.4 Findings

5.4.1 Women’s Struggles: Interplay of Socio-Political and Cultural Influences

²<https://miro.com/>

Impact of Socio-Political Influences:

A consistent theme emerged from our data, where all the participants highlighted their shared concerns regarding limited employment opportunities and challenges in pursuing entrepreneurship in our specific context. The participants voiced their apprehensions about the job market, citing the socio-political uncertainty in the region, disparities in remuneration, and the heightened difficulty in securing meaningful employment within the current circumstances in Kashmir. The participants emphasized the growing significance of self-employment as a viable alternative. However, our observations revealed a profound impact of socio-political situations and unrest on businesses in Kashmir. They spoke about the operational challenges arising in running successful businesses surfaced due to fear and security considerations stemming from the socio-political influences at play. We noted a complex interconnection between these influences and economic dynamics, disrupting daily lives and livelihoods and contributing to overall economic hardships. The regional circumstances, including strikes and curfews, significantly disrupted normal business operations, with varying impacts based on location. Particularly we noted that socio-political influences have differential impacts on businesses based on gender e.g., women-run businesses faced severe setbacks, experiencing complete shutdowns during both the COVID-19 pandemic and strikes. These periods of instability had lasting economic consequences, influencing career choices. As shared by a participant —

“In 2019’s conflict, women who had their stores in the main market couldn’t go out to open their stores. Their businesses were impacted since the phones and the internet weren’t working, and people couldn’t even reach out to them.” (P3)

Impact of Socio-Cultural Influences and Gender Barriers in Women’s Career Choices:

We observed a deeply ingrained and complex interplay of societal norms and gendered expectations shaping perceptions of women’s education and careers. We noted varying community perspectives, highlighting the prevalence of social stigma and judgments. The fear of societal scrutiny and taunts emerges as a significant barrier to women pursuing diverse careers, with instances cited of judgment and comments when women step out for work or engage in specific business ventures. The participants shared that concerns about working around men contributed to parental reluctance to allow their daughters to pursue careers, leading to career transitions driven by challenges in previous jobs, such as salary delays. Financial strains on families and the impact of local instability, including challenges in remote work, further highlighted

the intricate interplay of external factors on business and economic considerations. One participant shared a compelling example, citing her friend who was denied educational pursuits due to family expectations of prioritizing household chores. Furthermore, our participants mentioned that certain families view skill learning for women as wasteful, reflecting cultural barriers that discourage pursuits beyond traditional roles. They expressed that these expectations of specific roles for women lead to societal scrutiny, particularly in interfering with and questioning women's career choices. As a participant shared –

“I asked my friend to join the course with me, but she denied it, saying her family wouldn't allow it since she has to take care of household chores...They think it's a waste of time and nothing will come from it.” (P7)

We observed the crucial role of family support and motivation, the challenges women encounter in business, and the lack of acknowledgment regarding the importance of women acquiring skills. The family emerges as a primary support system, influencing women's choices and navigating societal perceptions and challenges. We also found that familial expectations and dynamics, especially in joint families, contribute to comments about income sources and reinforce traditional views, where any income from women is not considered good. We observed that even though families are supportive, they are influenced by societal norms and are mainly hesitant to showcase their support out loud. With this parental influence, driven by societal expectations, mostly restricts daughters from working outside the home due to the fear of societal judgment. As explained by a participant –

“Girls want to do jobs, but they are stopped from doing so. The parents fear how people would react to women going out to earn. Living in a joint family makes it even more difficult as the other members keep taunting our parents that their homes run on their daughters' money. My elder sister is a lab technician, and they would take ill about her too. We are often told that it's better to learn household chores than waste time trying to earn money. They are scared that working around men isn't a good thing. Sometimes, parents even stop their daughters from going out to work, fearing what the world would say.” (P11)

In summary, we observed that women faced challenges in pursuing employment and entrepreneurship due to socio-political unrest, societal norms, and gendered expectations. We noted a significant impact of familial support and societal scrutiny on women's career choices, with a complex interplay of external factors

influencing economic considerations and career trajectories.

5.4.2 Training Centers: Bridging the Path Forward for Women

Positive Learning Environment and Skill Development at the Training Center:

All the participants revealed that the training center consistently provided them with a positive learning experience, fostering a constructive environment, and was widely appreciated. Our observations indicate that all the participants visiting the training center emphasized information discovery and awareness about the center through social connections and word-of-mouth referrals. With this, the center earned recognition among all the participants as a space for evolving interests and motivation, enabling individuals to tailor their learning goals to specific needs. They highly praised the hands-on learning approach, emphasizing its contribution to their overall positive experience and encouragement of practical skill development. They mentioned the affordability of courses, making learning accessible, and breaking down financial barriers. The participants emphasized the center's focus on challenging traditional thinking, particularly regarding career choices, promoting a more open-minded approach to skill development. All participants emphasized the crucial role of personal motivation and interest in driving learning progress at the center. They expressed the importance of skill development for empowerment, appreciating flexible learning opportunities, and the ability to make choices based on individual preferences. Valuing the expanded course offerings and diversification of knowledge, they highlighted the discovery of learning's and skills provided at the learning center. The quality of teaching was acknowledged, underscoring the significance of effective communication between teachers and students and the value of the current teacher's learning environment. Participants found a balance between work and personal interests while contextualizing learning within their specific circumstances. Our observations indicate that the center's mission of empowerment through skill flexibility was evident, as the training accommodated girls who faced limitations due to marital status or completed education. We noted that the training effectively addressed societal constraints, providing a pathway for skill development aligned with cultural or personal circumstances. The observations further indicated that the training imparted skills and promoted entrepreneurship, encouraging girls to start home-based tailoring businesses. As mentioned by a participant –

“I want to learn this skill [tailoring and stitching] properly and then establish a proper business.

I want to run a boutique and sell designer clothes to shopkeepers. And moving forward, I want

to provide employment to girls.” (P7)

Motivations for Independence and Skill Acquisition:

We found that participants at the learning center expressed various motivations for joining, indicating a desire for skills acquisition and personal development. They highlighted the perceived usefulness of the learning environment, showcasing its positive impact on participants’ dependency and their evolving desire for independence. We noted that personal motivation played a significant role in decision-making, shaping the mindset and career perspectives of the individuals involved. The participants valued independence and self-sufficiency, adapting their learning schedules based on external factors such as the academic calendar. Positive peer influence and community building contributed to a supportive environment. We noted that the training center focused continually on long-term impact in fostering personal and professional development among its participants. As is explained by a participant –

“Many women come here to this training center who are married also and they are not that educated and cannot read or take mainstream jobs. Learning from here is that you can work flexibly and you would not need to go out. And many have completed their training and are undertaking tailoring work from their homes.” (P14)

Accessibility and Training Gaps at the Centres:

Apart from the positive impact of the training center on the local community, the participants also highlighted various challenges. For example, they spoke about accessibility and geographic distribution, where participants face barriers to access, and emphasized the existence of learning centers in other areas could potentially bridge gaps and enhance accessibility. They also spoke about a gap they identified in skill coverage, as the current program focuses solely on tailoring skills, neglecting crucial aspects like branding, costing, and transaction methods associated with running a business. Participants expressed a need for a more integrated learning experience that extends beyond technical tailoring skills to encompass broader entrepreneurial aspects. They underscored the importance of a sequential learning approach, emphasizing the need for a structured curriculum to enhance the overall learning experience. As shared by a participant –

“I feel like such learning centers should be in other areas too. Some girls have to travel a long distance to come here, if such centers will be available in their areas too, they can easily go

there and learn the skills properly.” (P9)

5.4.3 Navigating Technology: Usage, Perception and Challenges

Role of technology as a Catalyst for Women’s Skill Development and Entrepreneurship:

Our observations present a nuanced relationship between participants and technology, emphasizing a predominantly positive outlook. They demonstrated a forward-looking perspective, perceiving technology as a catalyst for skill development and entrepreneurship. We observed that digital solutions, like e-commerce, marketing, and education, being embraced with reliance and affirmation. Further, we noted that participants regarded technology as an indispensable empowering tool, utilizing it for skill enhancement, doubt clarification, and boutique preparation. We observed the positive role of the internet in women’s businesses is acknowledged, where they spoke about technology being important in facilitating smooth transactions and making operations more accessible. They recognised the success of many women entrepreneurs who actively utilize online platforms to enhance business activities. We noted that social media platforms, particularly Instagram and Facebook, are viewed as dynamic learning tools, allowing practical application of acquired techniques. The participants exhibit a preference for multi-functional usage, appreciating personalized content consumption, and engaging in discussions on these platforms. As a participant shared –

“There are many pages on Instagram that I follow and learn from. Some of them are stitch club, tailoring master, etc. They teach different types of designs and patterns of stitching. I practice designs at home after learning them from Instagram and YouTube. These pages have helped a lot. They help us learn and remember techniques.” (P6)

Furthermore, we found a discernible inclination and long-term aspirations towards leveraging technology for business promotion, evident in activities such as advertising on Facebook, posting videos on YouTube, and creating trend-based broadcasts. We observed that the transformative impact of technology has heightened entrepreneurial aspirations among participants, fostering a preference for an online home-based business model. They expressed intentions to leverage social media for business promotion once their boutiques are established. For example a participant mentioned, *“social media helps a lot when it comes to promoting businesses”* (P7). They indicated a keen interest in understanding and learning the contemporary business trends with strong recognition of the pivotal role of social media, digital marketing strategies, and strategic growth planning towards following their business pursuits. Additionally, our observations highlight the

participants' understanding of entrepreneurial adaptability during times of unrest. For example some participants spoke about the online businesses through social media of selling essential commodities when others were closed that emerged out run by women particularly during the the COVID-19 pandemic. After this they spoke about the pronounced shift towards online businesses, delivery services, and innovative business models specially operated and administered through social media platforms like Facebook, Instagram and WhatsApp. They pointed towards the broader adaptation to changing consumer behaviors and external circumstances, emphasizing the dynamic role of technology in shaping contemporary business landscapes. For example as is shared by a participant —

“Two siblings opened their shop during the unrest where they would sell essential commodities like groceries, etc, and the business ran well considering how every other shop was closed. During COVID, people started online stores and also started delivering medicines since people weren't going out.” (P2)

Challenges and Cultural Barriers in Women's Technology Use for Business:

Apart from the merits of the technology offering online learning and business opportunities for women reported above. The participants also highlighted drawbacks with the technology usage, including challenges like internet unavailability during strikes, impacting resource access, and digital entrepreneurship navigation. They spoke about their experiences and growing concerns with the online transactional frauds, spams and privacy concerns around the businesses mostly run through social media platforms. Many participants also expressed a preference for offline business due to lack of communication skills and outgoing personalities important for online businesses. We observed regional disparities in technology usage, particularly between Kashmir and other areas, as they revealed challenges in gender dynamics for content creation. The participants highlighted that women in Kashmir were generally hesitant to share work videos due to prevalent gender norms, social expectations, and cultural barriers. This hesitation stemmed from societal perceptions that women who showcase themselves or promote their faces on the internet are subjected to judgments. Additionally, they also raised points around the majority of available content of skill building around tailoring and stitching online not aligning with traditional Kashmiri values. A participant shared –

“You will notice that the videos related to tailoring or designs from Kashmir are minimal. And their likes and views are much less than on the videos from outside. Most of these videos and

designs from outside are irrelevant to our place because they don't align with our society's standards and traditions. You would see girls here are very skilled and creative, but they do not put up the videos because they are hesitant to put their faces in them. After all, it is not considered a good thing.” (P13)

They emphasized the importance of having an understanding of cultural attitudes, locally relevant foundational knowledge of a community that aligns with their values as crucial balancing factor in learning and skill building processes.

5.5 Discussion

Here, we delve into the discussion by aligning our focus with the HCI's discourse dedicated to the empowerment of women and skill enhancement. Drawing upon our understanding of the local context in Kashmir and guided by the insights gained from our analysis, we unpack the challenges encountered and delineate future directions for advancement in this domain. While numerous challenges that we describe below have been documented in the existing literature, the distinctive context of Kashmir exacerbates the severity of these challenges for women. Our findings demonstrate the complex interplay between societal norms and socio-cultural factors that shape women's entrepreneurial journeys in Kashmir. While we identified a strong recognition and acknowledgment of self-employment as a path to economic empowerment for women, the unique context presents significant challenges. We observed that socio-cultural influences undeniably impact women's employment prospects and opportunities, with contextual disruptions leading to economic instability in specific locations. The severity of these disruptions varies geographically, further amplifying the challenges faced. Our findings further reveal that societal conditioning and norms pose significant hurdles. For example, gender stereotypes, societal judgments, and expectations create a complex landscape for women entrepreneurs. Our observations underscore challenges stemming from familial resistance to work in male-dominated environments, social stigmas, and related issues. We also identified participants' concerns and challenges with technological navigation. These range from the non-availability of the internet during disruptions where disconnectedness leads to financial loss in businesses to challenges, particularly regarding privacy concerns, limited contextually relevant online content, and hesitation in sharing posts with their faces related to their business online. Additionally, participants grappled with concerns related to privacy, the scarcity of contextually relevant online content, and reservations about sharing business-related posts

featuring their faces. These technological challenges underscore the multifaceted nature of individuals' concerns in the digital realm, emphasizing the need for comprehensive solutions to address these issues.

These challenges specific to the context necessitate a much deeper understanding and investigation of such regions by the HCI community. Thus makes it imperative to enforce effective solutions in Kashmir, which require consideration of its unique cultural, political, and social landscape, along with challenges such as operational challenges with business at specific locations or intermittent internet connectivity in the regions. The HCI community must enhance contributions by designing solutions tailored to the region's specific challenges, avoiding assumptions inherent in mainstream decision-making that may not effectively address the unique context of the area. This would mean for the HCI community to collaborate with local initiatives to identify pathways to remote and virtual scaffolding strategies by designing interventions that accommodate the region's constraints, paving the way for resilient socio-technical solutions. One of the possible ways to address this would be offering extra scaffolding to local initiatives that work for women's economic empowerment in the region and advocate for expanding localized opportunities. However, despite these challenges, our findings highlight the positive impact of local NGO initiatives, acting as safe spaces that foster motivation, shape long-term goals, build community, and provide platforms for skill development and entrepreneurship encouragement among women. While training centers contribute to peer learning and community building, the participants identified gaps, which also call for improvements in the efforts of local initiatives and training spaces. More focus should be foregrounded on these initiatives as they provide a safe space for fostering motivation, shaping long-term goals and aspirations, and building community among women. These spaces serve as a crucial platform for skill development and empowerment, promoting entrepreneurship, and encouraging the evolution of women's desires and long-term aspirations.

Furthermore, participants also offered feedback emphasizing the need for an integrated approach in designing spaces to promote collaboration and knowledge sharing across various entrepreneurship-related domains that integrate various domains relevant to entrepreneurship. Taking an integrated approach could mean designing integrated design platforms that facilitate collaboration and knowledge-sharing among women entrepreneurs in Kashmir, promoting a holistic approach to skill development and business growth. For example, the platform should focus on details that incorporate modules on business plan development, financial literacy, and marketing alongside traditional skills training, fostering collaboration between trainers from various domains. Additionally, addressing technological challenges, particularly regarding privacy concerns and limited contextually relevant online content, is crucial. Design solutions should focus on

creating and presenting locally relevant content while fostering both offline and online communities. For example, researchers and practitioners can develop design guidelines for online training platforms used by NGOs in Kashmir, focusing on features like user-controlled privacy settings, anonymous reporting mechanisms, and partnerships with local organizations to address online harassment complaints. Further, the design solutions should encourage both offline and online community building. This should be done by creating physical spaces for women to gather, share experiences, and collaborate alongside online platforms that provide a virtual community for networking, mentorship, and support. Drawing from the literature, we also suggest that researchers conduct participatory action research (PAR)[39], focusing on collaborating with local communities to co-design solutions, ensuring their voices and needs are central to the research process and outcomes, with a focus on developing culturally relevant training materials where researchers and practitioners can partner with local stakeholders to create contextually relevant training materials, address cultural sensitivities, and cater to the specific needs of women entrepreneurs in Kashmir. Further, there is a need to Advocate for such community training centers as spaces that partner with local authorities to establish multimedia-equipped community centers in under-served areas, offering workshops on entrepreneurship, legal rights, and digital literacy alongside providing space for community meetings and events. These spaces should also be equipped to facilitate peer learning and community building, for example, by organizing monthly workshops within training centers where women entrepreneurs can share their experiences, exchange business ideas, and build supportive networks, facilitating both offline and online connections.

Closing Reflection: In summary, this study highlights the interplay of societal and cultural influences that create barriers for women in pursuing entrepreneurial aspirations. It underscores the role of Community Training Centers as safe spaces for skill development, fostering motivation and independence. While technology offers opportunities for learning and business promotion, findings reveal challenges including internet unavailability, online transactional frauds, and cultural hesitancy in content sharing. This study contributes to RQ1 and RQ2 by detailing women’s struggles and adaptations, and addresses RQ3 by offering design directions that recognize the importance of gendered, informal, and resourceful practices. As skill-building emerges as a critical intervention for economic agency, the next chapter delves into how women in Kashmir independently navigate entrepreneurship through digital platforms like social media—often outside institutional settings.

Chapter 6

Case Study IV: Social Media Entrepreneurship

Asra Sakeen Wani, Divyanshu Kumar Singh, and Pushpendra Singh. (2025). *“People take you for a person pursuing a hobby”*: Women’s Experiences with Online Entrepreneurship. (Under-submission DIS’25)

CHAPTER 6

CASE STUDY IV: SOCIAL MEDIA ENTREPRENEURSHIP

6.1 Introduction

Women historically have faced systemic exclusion from mainstream workforce and economic opportunities due to various reasons like unequal access to jobs, workplace harassment, and wage disparities [195, 196, 411, 230, 48]. These disparities are exacerbated in patriarchal societies, where socio-cultural and economic barriers further hinder women's participation. [172, 44]. Thus, women from such contexts are often relegated to low-income informal sectors, such as gig work or crowdfunding work [232, 373, 162, 370]. For instance, in India, the labor force participation rate for women is just 23.6%, underscoring a significant gender gap [269]. Despite these challenges, the growing integration of online infrastructure and contemporary social media platforms into everyday life has expanded the boundaries and modes of work, creating new opportunities for economic development. As a result, many women are turning to online spaces to leverage these platforms to form social connections and seek work and business opportunities [410, 257]. The widespread influence of these platforms, particularly social media, has democratized entrepreneurial opportunities, especially making small-scale entrepreneurship avenues more accessible for women [249, 169] due to its low entry barriers, broader reach, and minimal infrastructural requirements [226].

Research in Human-Computer Interaction (HCI) and Computer-Supported Cooperative Work (CSCW) in the area of future of work has explored how emerging technologies and online digital labor platforms have reshaped job roles, employment, and the broader digital labor landscape [27, 414, 6]. More recently, HCI and CSCW scholarship has increasingly turned its attention on expanding its realm, focusing on contemporary technology infrastructures presenting online entrepreneurial and self-employment opportunities, particularly among online content creators [392, 131] and creative entrepreneurs [202, 197]. Studies has explored how people are leveraging platforms like YouTube [231, 36], TikTok [328, 327], Instagram [273, 99], and WeChat [57, 416]. In line with this, research has highlighted the role of social media in commerce; for instance, platforms like Facebook, Instagram, and WhatsApp are reported to have become essential entry points for women entrepreneurs and small business owners in developing regions, offering low-cost, accessible avenues for economic participation [249, 392, 164, 72]. While these platforms offer opportunities

for economic empowerment, they also present challenges; for example, studies have reported that women are more likely to experience online harassment, stalking, privacy concerns, surveillance, and persistent gender bias than men [351, 131, 81]. However, these challenges become further heightened for women in regions where entrenched socio-political and patriarchal structures exacerbate their difficulties, such as ours in Kashmir.

Chapter Overview: This chapter addresses Research Questions 2 and 3 by investigating how women entrepreneurs in Kashmir use social media platforms to establish and grow small-scale businesses. It explores the creative, logistical, and emotional labor involved in navigating platform infrastructures, social norms, and algorithmic visibility. The study offers insights into how digital tools are appropriated in constrained environments and how agency is exercised under multiple forms of precarity.

6.2 Labour, Business and Work

We situate this review in a broader realm of scholarship in HCI and CSCW at the intersection of gender dynamics, labor, work, and business practices. These areas are primarily recognized as essential drivers of economic development and income generation. Research in HCI and across disciplines has consistently documented women's challenges and inequities in accessing mainstream employment opportunities and achieving economic advancement. These inequalities are typically manifested in various forms, including access to limited resources [252], wage disparities [37, 48], long and irregular work hours [375], gender stereotypes [172, 44], and workplace harassment [143, 230, 295] among others. Similarly, a substantial body of scholarship has underscored the challenges women face in traditional entrepreneurship, business practices, and leadership roles [34, 191]. Almarzouki et al.'s work reveals that women are often underrepresented in senior positions, as these fields tend to perpetuate structural disparities due to their predominantly male-dominated nature, thereby hindering women's economic advancement [7]. Studies have also explored various other factors like socio-economic, socio-political, and socio-cultural factors that shape employment and business dynamics [89, 87, 85, 388]. While these challenges are global, they are particularly severe in contexts where structural inequalities [182, 378, 55, 292], lack of access to education [31, 244], gendered digital divide [222], patriarchal attitudes and societal norms [172, 44] dictate women's roles, hindering their integration into the workforce. However, research has reported ways women are overcoming these barriers and engaging in diverse forms of work, like migrating to informal or online remote forms of work to achieve

economic progress [414, 6].

A growing research in HCI on future of work, digital labor platforms like gig economy apps and remote work tools [27, 414, 6, 96], including UpWork [304], Airbnb [146, 233, 259], Uber [208, 8], and Amazon Mechanical Turk [373, 162, 370], shows how these platforms have transformed service-oriented work. These platforms enable workers to perform a wide range of tasks remotely, offering flexibility and convenience that have redefined traditional employment models [220]. For example, Wood et al.'s work investigates how these platforms impact worker autonomy, job security, and income stability [400]. Despite their benefits, women's experiences on digital labor platforms are shaped by platform-specific dynamics and broader societal norms and perpetuate the existing gender inequalities and biases [139]. Kullmann's work shows that women on these platforms frequently earn less than their male counterparts, face higher levels of job insecurity, and are more likely to engage in lower-paid, less-skilled tasks [205]. Women from marginalized communities often face multiple layers of discrimination, resulting in even greater inequities on these platforms [170, 230]. Ma and Rivera et al.'s work examined the challenges women face in gig economy platforms, such as ride-hailing and food delivery services. It reveals that despite the gender-neutral policies of these platforms, women are particularly vulnerable to bias and harassment due to a lack of supportive measures on these platforms [230], with these platforms further enforcing control worker autonomy despite promoting flexibility [100]. In line with the affordances of online infrastructure, a nascent yet growing area of research on contemporary social media platforms has catalyzed a shift towards small-scale business activities, offering new avenues for women to seek autonomy, job security, and control over their work. We build on this scholarship by investigating the experiences of how women in regions with complex socio-political and patriarchal norms create their entrepreneurship pathways, highlighting the challenges they face and the strategies they use to improve their economic standing.

6.3 Social Media, Entrepreneurship and HCI

HCI and CSCW research has investigated the diverse challenges and opportunities that social media presents across various domains, including health information seeking [404, 187], emotional support needs [12, 127, 289, 80], supporting academic activities [374, 255], supporting career development and employment information access [282, 225], and enabling online buying and selling [83, 168, 98]. A growing scholarship in HCI and CSCW is increasingly focusing on expanding its scope to explore technological infrastructures

that enable online entrepreneurship and self-employment opportunities, particularly among content creators [392, 131] and creative entrepreneurs [202, 197] leveraging platforms like YouTube [231, 36], TikTok [328, 327], Instagram [273, 99]. The evolving nature of work has led to increased attention on the role of social media in facilitating new entrepreneurial opportunities; for example, studies show how social media platforms such as Facebook, Instagram, and WhatsApp have become integral to daily livelihood practices worldwide [50, 125]. This integration has given rise to social commerce, a form of e-commerce that utilizes online social networks to drive economic transactions [415, 221, 64]. Research has emphasized that social commerce is particularly appealing in emerging markets due to its low entry barriers, lack of business license requirements, minimal investment, and flexible payment options [226].

Schoemaker et al. studied how Kenyan farmers use social media to improve agricultural practices, trade, and information sharing. Their study underscores social media's role in diversifying livelihoods while addressing trust and safety concerns, offering insights into the social factors shaping platform adoption in agriculture [307]. Several studies highlight Facebook as a key platform for social media commerce (F-commerce) in developing regions, particularly as an entry point for women entrepreneurs [249, 169]. Studies have expanded social commerce research to Instant Messaging (IM) platforms like WeChat, showing that users in China increasingly share and recommend products to friends in group chats [57, 416, 384]. This research emphasizes how social commerce on IM platforms leverages existing social connections, trust, and community norms to influence consumer behavior [50]. Similarly, Ankolika De's work on WhatsApp for Business in India uncovers rapid technology adoption's ethical challenges and impacts on small businesses in a diverse cultural context [72]. Research also shows how Instagram plays a crucial role for content creators and creative entrepreneurs and how they navigate algorithmic changes that affect their livelihoods [131]. Studies have also examined the challenges posed by social media algorithms, emphasizing the need for creators and entrepreneurs to maintain a presence on multiple platforms to mitigate risks [322, 323]. Research on digital engagement among minority small business owners in the U.S. highlights Facebook and Instagram as essential platforms for online business activities and community-driven digital capacity-building programs [153, 232, 164]. These studies emphasize the challenges of technology adoption in resource-constrained environments and the need for culturally aware interventions. We extend this body of work, offering a deeper understanding of social commerce, specifically focusing on social media-based businesses. We present how women navigate socio-cultural and gendered norms in Kashmir while running their online businesses and offer design directions that could better support and facilitate women's

entrepreneurship.

6.4 Research Questions

What are women's unique entrepreneurship experiences and challenges with owning a digital platform-based business in Kashmir? and, What social stigmas and challenges do these women encounter, and how does the technological infrastructure influence their everyday practices in tech entrepreneurship?

6.5 Methods

We interviewed women running small businesses on social media platforms in Kashmir to understand how they utilize these platforms for their business operations. This study was approved by our Institute's Review Board (IRB), and we conducted the study in Kashmir from mid-February to April 2023. Below, we describe the participant recruitment criteria, study methods, and data analysis approach.

6.5.1 Participant Recruitment and Data Collection

We utilized purposive [357] and snowball [138] sampling methods to recruit participants. The participant recruitment was conducted online, leveraging personal social connections through platforms like Twitter, Instagram, Facebook, WhatsApp, and Telegram. We shared a recruitment survey with a flyer outlining the study's objectives on the first author's social media accounts. Additionally, we posted the study details in a well-known Kashmiri female Facebook group and directly reached out to various women-run pages on Instagram and Facebook. To further extend our reach, we requested all the recruited participants to share the study details with their networks. The decision to use the first author's social media was driven by the fact that the majority of people in their network are Kashmiris, which aided in facilitating the recruitment process.

In the recruitment survey, we collected general demographic information from participants, including their age, highest level of education, marital status, nature of their online business, and consent to participate in the study and interview. We used the following inclusion criteria for recruitment: i) women aged 18 or older, ii) operating a business in Kashmir, and iii) using social media as part of their business strategy. These criteria were mainly set to focus on women actively engaged in entrepreneurship within the Kashmir region, with a specific interest in understanding their experiences using social media for business purposes.

We aimed to explore their perspectives on how current social media platforms support or challenge their entrepreneurial activities. We received 21 responses to the recruitment survey and conducted 19 semi-structured interviews with those who responded to our follow-up communication. Table 6.1 provides the detailed demographics of our participants, and Figure 6.1 below offers an overview of the nature of the business pages run by women.

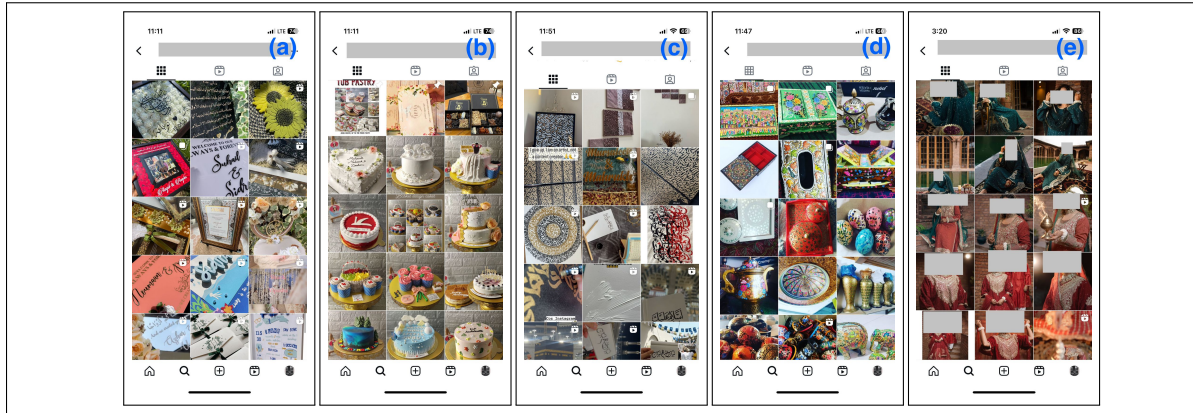


Figure 6.1: The labelled images showcase the various types of businesses our participants operate on Instagram (a) Customised Nikah Namas and Frames, (b) Home Baking, (c) Calligraphy and resin art with frames, (d) Handmade Papier-mâché products, and (e) Customised Clothing

All interviews were conducted online, using phone, Zoom, or Google Meet, depending on the participant’s preference. Each interview lasted from a minimum of 35 minutes to a maximum of 120 minutes. The first author conducted all the interviews in Kashmiri, Urdu, and English. The interview protocol was broadly organized around the following themes: a) background and introduction, b) entrepreneurial journey, motivations, and experiences, c) business operation strategies, d) socio-cultural influences and perspectives, and e) the impact of technology and social media on their business operations. For instance, we asked questions like: *“Could you describe what it’s like to be an online business entrepreneur in Kashmir?”*, *“Can you talk about how you first came up with the idea for your business and the technology you use to support it?”*, *“Can you give some examples regarding your experience using these platforms?”* and *“Did you face any challenges while using these platforms?”* All the participants were informed about the purpose of the study and were duly assured of anonymity, and verbal consent was collected from them. Participation was entirely voluntary, and no compensation was offered. Data collection included audio recordings, field notes, and video recordings, all obtained with the participants’ consent. The recordings were then translated and transcribed into English, for analysis.

ID	Age	Highest Education	Marital Status	Business Duration	Type of Business Page	Social Media Platforms
1	30	Post Graduation	Single	3 years	Custom Clothing	Instagram, Facebook, WhatsApp
2	28	Graduation	Single	1 year	Handmade Gifting	Instagram, Facebook, WhatsApp
3	27	Graduation	Single	2 years	Calligraphy, Resin Art, Frames	Instagram, Facebook, WhatsApp
4	28	Post Graduation	Single	3 years	Calligraphy, Resin Art, Frames	Instagram, Facebook, WhatsApp
5	36	Post Graduation	Married	4 years	Custom Clothing	Instagram, Facebook, WhatsApp, YouTube
6	24	Post Graduation	Single	1 year	Calligraphy, Resin Art, Frames	Instagram, Facebook, WhatsApp
7	23	Graduation	Single	3 years	Makeup Artist	Instagram, Facebook, WhatsApp
8	27	Graduation	Single	1 year	Handmade Gifting	Instagram, Facebook, WhatsApp
9	26	Graduation	Married	3 years	Home Baker	Instagram, Facebook, WhatsApp
10	27	Graduation	Single	3 years	Customised Nikah Nama, Frames	Instagram, Facebook, WhatsApp
11	28	Post Graduation	Single	3 years	Customised Clothing	Instagram, Facebook, WhatsApp
12	29	Post Graduation	Single	3 years	Papier-mâché products, Paintings	Instagram, Facebook, WhatsApp
13	26	Post Graduation	Single	2 years	Customised Clothing	Instagram, Facebook, WhatsApp
14	30	Graduation	Single	3 years	Handmade Gifting	Instagram, Facebook, WhatsApp
15	26	Post Graduation	Single	1 year	Beauty Products	Instagram, Facebook, WhatsApp
16	28	Post Graduation	Single	2.5 years	Home Baker	Instagram, Facebook, WhatsApp
17	25	Post Graduation	Single	3 years	Calligraphy Frames	Instagram, Facebook, WhatsApp
18	26	Post Graduation	Married	1 year	Handmade Papier-mâché Products	Instagram, Facebook, WhatsApp
19	24	Post Graduation	Single	2 year	Handmade Kashmiri Heritage Goods	Instagram, Facebook

Table 6.1: Demographics of the interview participants. [Case Study IV: Social-media based Entrepreneurship]

6.5.2 Data Analysis

We began by transcribing the 36 hours of interview data and sharing it with the entire research team. The transcribed data was then analyzed using an iterative inductive thematic analysis approach [41]. The first author conducted the initial round of analysis, performing line-by-line open coding of all transcripts. The research team then met to review and align the codes collaboratively, ensuring consistency across the analysis. Throughout the process, the entire team met regularly and remained actively involved. For example, initial codes included concepts such as “*gender stereotypes in business*”, “*platform-specific challenges*”, and “*influence of social media*”. These codes were subsequently grouped into first-level categories, and the team collaborated to develop higher-level codes, such as “*genesis of entrepreneurial aspirations with constrained ecosystem*” and “*online business presence shaped by religious and societal norms*”, based on emerging patterns in the data. Finally, we identified broader themes like “*entrepreneurial journey, motivation, and aspirations*” and “*role of technology in business operations*”. To facilitate this process, we utilized tools such as Miro-board¹ and Google Sheets for brainstorming and theme construction.

6.5.3 Limitations

We acknowledge that our study has limitations, and we discuss them here. This study recruited participants online using purposive [357] and snowball sampling [138] methods. Our sample predominantly included

¹<https://miro.com/>

women with access to technology, familiarity with online platforms, digital interfaces, and higher levels of education. For this work, we could not engage with women with lower educational backgrounds and even more limited access to technology. We recognize that women from this demographic often face significant barriers, such as limited access to education, lack of ownership of technological devices, caste discrimination, and minimal employment or entrepreneurial opportunities [69, 371], leading to their underrepresentation in research studies. We acknowledge that a larger, more diverse sample would offer broader insights, and we aim to address this in our future work.

6.6 Findings

We first present the entrepreneurial journey of women operating small-scale online businesses, their motivations, and aspirations for starting these ventures. Next, we describe how they navigate the non-digital entrepreneurial ecosystem, their obstacles, and the social and technical support systems they rely upon. Finally, we present the role of technology in their ventures and the specific challenges they encounter in managing an online business.

6.6.1 Entrepreneurial Journey, Motivation, and Aspirations

Genesis of Entrepreneurial Aspirations with Constrained Ecosystem

Our analysis highlights that the pre-existing economic and job-market conditions, which historically have remained scarce in Kashmir, significantly influenced the entrepreneurial journeys among our participants. The limited job opportunities and restricted movement imposed by the 2019 shutdown [388, 317], followed by the COVID-19 pandemic, had further exacerbated these difficulties and resulted in minimal job opportunities. Many participants discussed the challenges they faced entering the job market after completing their education, which for most coincided with this period, leading them to explore alternatives to traditional employment. As P15 recalled her experience:

“After I finished my MBA in 2018, I tried to find a job in Srinagar, but there weren’t many corporate jobs available. Even working from home wasn’t an option back then. I really wanted to earn money doing something I loved.” — **(P15, Post Graduate, Beauty Products)**

Despite the harsh economic conditions following the abrogation of Article 370 and the COVID-19 pandemic, nearly all participants indicated that these constraints significantly influenced their career choices.

This period represents a transitional phase in our context, where political disruptions and internet shutdowns have lessened, but their lingering effects may remain. Interestingly, the pandemic opened up new economic avenues and aspirations for them that had previously been difficult to pursue. Online businesses, in particular, emerged as viable options for them due to the limited mainstream employment opportunities during and after the pandemic. We found that most participants launched their ventures post-2019, with the pandemic accelerating the shift toward online entrepreneurship. They highlighted how this period introduced them to new business opportunities and revealed the potential of social media as a crucial platform for their entrepreneurial endeavors. Moreover, social media, particularly posts showcasing successful women turning hobbies into businesses outside of Kashmir, served as a major source of inspiration for them. These influences sparked discussions within families and friends, turning spontaneous ideas and hobbies into professional pursuits. Participants mentioned that the pandemic allowed them to test, experiment, and monetize their skills online:

“During COVID-19 lockdown, I saw how powerful social media could be. I got inspired by pages like Sunnysmilebakes and RingsNRoses, so I decided to start my own business selling beauty products.” — (P15)

Although, it was not just about pursuing hobbies, most participants conducted market research to strategically align their products and services with current demands and opportunities, allowing them to monetize their skills more effectively. For them, the primary motivation for pursuing an online business was the affordability of starting one—creating a social media account was all it took. The infrastructural costs of traditional business, especially in a context like ours, are high, such as renting spaces and logistics. Our participants emphasized the appeal of low-cost entry barriers, which eliminated the need for substantial investments, which otherwise could have been hard to acquire:

“A friend of mine used to import clothing apparels, I realized the margin was good plus the infrastructural need was negligible. For an online business, you don’t need a physical shop or any big investment so you can start small, so I started, and Alhamdulillah it is flourishing now.” — (P5)

This flexibility, or rather a riddance of traditional infrastructure, encouraged our participants to embrace the “risk” of exploring a new online self-employment avenue.

Monetary and Personal Upliftment via Business

While market condition and affordability were major external infrastructural factors shaping the participants' decisions and journeys, our analysis also revealed a range of extrinsic and personal factors at play. We noted that the potential for monetary gains was the primary motivational driver, as all participants aimed to achieve economic stability and provide for themselves and their families. Their choices were also influenced by the prospects of professional rewards and recognition that entrepreneurship offers. Moreover, for them as women who had their privileges with access to education and technological resources, this turned out to be a viable option. The comprehensive awareness of their privileges, coupled with a desire for recognition and financial success, further motivated them to embark on their entrepreneurial journeys:

“Money is the primary source obviously, besides it gives a sense of being financially independent and security even if the profit or gross income is small, it serves as a hope towards a secure future at least for survival in case of emergency or unfortunate things.” — (P6)

We also noted that autonomy, passion, and cultural engagement played key motivating factors among women, where a sense of owning these factors positively impacted their psychological well-being, making entrepreneurship a deeply rewarding path for them. The dual reward of income and autonomy (being a leader) that entrepreneurship offered also outweighed their skepticism about pursuing a business online. Participants appreciated owning a business's autonomy and independence, allowing them to control their operations and make decisions that best suit their needs. Throughout our data, women underscored the emotional satisfaction they gained from having centralized control over their business operations:

“Being an entrepreneur is very good – you are independent. You work when you want to work. It gives a person freedom, and I think this freedom is very necessary, especially as a female. I think it doesn't make you feel burdened. That is the good part of it in my opinion.” — (P2)

Additionally, we uncovered that a strong sense of passion, often rooted in personal interests and cultural engagement, was a powerful motivator for these women. For instance, many participants were driven by the desire to advance creative ideas and preserve Kashmir's traditional and cultural heritage. These passions were further strengthened by the acknowledgment, positive feedback, and praise they received from the customers and beyond, boosting their confidence and deepening their commitment. The ability to earn

through passion-filled work provided personal fulfillment and added meaning, enhancing their dedication to their businesses. They expressed satisfaction by contributing to their clients' significant life events through their creative efforts:

“In your own business, you are both the boss and the employee. Although you have to handle everything on your own, the flexibility is a pro of it... Mostly, people order for their special events and for their loved ones. I feel great being a part of their special moment.” — (P3)

Participants also spoke about the inspirational impact of their entrepreneurial success on others, emphasizing that their achievements motivated many to start their ventures, further enhancing their fulfillment. For example, P3 mentioned, *“Now there are so many artists, and people text me saying that they got inspired by seeing me, so it makes me very happy.”* These acknowledgments validated their aspirations and strengthened their hope for future growth and the perceived value of their efforts.

6.6.2 Navigating Gendered Challenges and Socio-Cultural Dynamics

Socio-spatial Gendering of Business Infrastructure

While possessing passion and goals is one aspect, fulfilling them is quite another, particularly within contexts shaped by layered socio-cultural and religious values, often intertwined with hetero-patriarchal norms. Our participants faced many challenges rooted in these societal expectations, which often limit women's roles. These challenges are deeply embedded with patriarchal assumptions where societal expectations dictate women's roles, affecting their business and personal growth. In this region, the digital marginalization of women is uniquely distinct, as it is intensified not only by these deeply ingrained socio-cultural barriers but also by the pervasive socio-political conflict, which compounds challenges related to digital access, mobility, and the policing of online presence. They shared that women are typically expected to prioritize household responsibilities, and pursuing work outside the walls of the household adds to their burden. It complicates their ability to maintain a work-life balance, as spatially, they need to cater to two sites — household and the business, often leaving their struggles unrecognized and unsupported. P5 mentioned experiencing a common stereotype, *“how can a woman manage a business she has to manage household chores.”* We found that these spatially gendered patriarchal values are complex and extend to the nature of work a woman can pursue, as well as to where and how they can engage in it. Also, the nature of work being pursued by women is socially policed, with roles like being a tailor or make-up artist being looked down on.

While these jobs are valuable, the societal perception of such work questions a woman's character when her work takes her beyond the spatial boundaries of her home. P7 recalled:

“There was this makeup artist who was denied her payment and was told, ‘We know the kind of homes you come from. What kind of parents let their daughters become makeup artists’.” —

(P7)

In addition to the above, we noted that women owning shops often encounter patriarchal gendered scrutiny, often labeled with subtle yet derogatory remarks like — *“dukaandar ban gayi ab ye”* (*she has become a shopkeeper now*). While this may not seem like a derogatory comment in translation, but within our context, it is the manner and tone in which it's delivered that belittles women's professional efforts. This scrutiny further intensifies in formal business settings where women's ownership of physical spaces is stereotyped and deemed inappropriate, reinforcing the biased notion that formal business setups are predominantly male territories. All these encounters reflect broader gender-specific challenges, including derogatory perceptions, social stigmas, and negative experiences in male-dominated spaces that undermine women's business efforts. These biases also extend to business interactions in male-dominated spaces, as participants reported facing difficulties with suppliers who do not regard women as seriously as men, often requiring male involvement for credibility:

“I import from suppliers outside and my husband helps me in this and all the dealings conversations with suppliers outside he handles majority of that. And I think that's really important when working as women because otherwise people who you deal with or these suppliers don't take you that seriously as a woman and that's the reality we have to accept it.” — **(P5)**

Moreover, women's businesses are often dismissed with a mere *hobbyist label* and not regarded as legitimate enterprises, which affects their perceived value. Many participants faced family skepticism early on, which only shifted positively as their businesses grew. As P7 shared, *“Initially, my family was not supportive, but as orders increased, they started to see the value in what I was doing.”* This dismissive attitude is even more pronounced for online businesses, which are often treated with skepticism and not taken seriously:

“Online business owners, though now recognized as business people, are not taken seriously. People take you for a person pursuing a hobby, or more like, does it even count. People provid-

ing services via Instagram e.g. makeup artists or boutique owners or henna artists, they are not treated respectfully.” — (P5)

Business Presence Shaped by Religious and Societal Norms

Interestingly, we noted that the conservative and religious values in our context shape how entrepreneurs portray the presence of their online businesses. Cultural taboos, religious beliefs, and gender restrictions play a crucial role in shaping the portrayal of business-related content. For instance, content that features women in a way that is perceived as immodest (e.g., showing skin) or that does not align with local religious boundaries can be problematic. The concept of women as models, for example, is heavily stigmatized in our society, where models are often viewed as not adhering to religious, cultural, or modest values,² such as the expectation from women to be fully covered. Deviation from these can lead to negative perceptions and social ostracism. These societal judgments not only extend to the online space, where a model’s image, if not deemed respectable according to societal norms, can undermine the credibility of their business. This judgment carries over into their offline lives, affecting their reputation and attracting hateful, harsh comments within the community and beyond. These conditions compel these women to carefully navigate cultural sensitivities, balancing societal norms with business growth demands. Drawing on Goffman’s concept of fluid identity and self-presentation, their management of online visibility often involves a form of ‘strategic opacity’, a deliberate partial disclosure or careful curation of their public persona. This allows them to preserve credibility and avoid social scrutiny while still engaging in entrepreneurial activities. We uncovered that these entrepreneurs often have to adapt their operations and strategies to align with external perceptions, or else they fear facing a lack of professional recognition and isolation in their businesses:

“In Kashmir, you have to be very careful about what you post, and it is a big deal because people get offended very easily. In fact, you also have to consider the people you are working with (e.g., models to showcase products), like what their public image is. You also need to think about the current situation in Kashmir when deciding whom to collaborate with. It’s a dilemma most of us face while posting anything on social media because it has an impact on your offline life. Given that anything and everything posted here leaves a permanent digital footprint, it’s perhaps best to protect yourself from unwarranted, harsh comments and judgment. The biggest

²Islamic law requires women to cover their bodies, except for the face and hands, as a sign of modesty, obedience to God, and respect for Islamic values.

downside is that social media will never let you forget what you did, when, and where.” —

(P11)

This adaptation leads them to manage their social media presence and customer interactions with heightened caution, as cultural norms can heavily influence business practices and client relationships.

Family, Friends, and Online Peers as Support Networks

To overcome the various challenges described, we noted that women often draw resilience and find opportunities through support networks. These networks include close family, friends, and broader online community connections, providing women with practical business assistance and crucial emotional and strategic support to navigate the complexities of societal norms, cultural expectations, and gender dynamics. We noted that these support networks, especially family and friends (typically males), are often considered critical in strategic decision-making and daily business operations. We saw that many women entrepreneurs rely on their families, even if they are not formally involved in the business, to share responsibilities and help manage their enterprises. This support ranges from strategic involvement to day-to-day management tasks, highlighting the importance of family dynamics in business success. For instance, the presence of male family members in negotiations with suppliers mitigates gender biases and facilitates smoother business operations:

“My dad is my backbone. I call him my rescuer because if there comes an last-minute order he helps me in bringing the frames or materials I need for my work. In short, for last-minute orders, the materials are arranged by my father.” — (P6)

Apart from family and friends, these women have established an online peer support network that plays an important role in their entrepreneurial journeys. Through this network, they empathize with each other’s challenges and advocate and stand up for any businesswoman facing extreme harassment or situations that necessitate public attention. For example, they demonstrate solidarity by rallying online around the affected individual, sharing supportive posts, and providing support during such times. Furthermore, we noted that online community spaces, e.g., a moderated women-only Facebook group, serve as vital platforms for women to share experiences, vent frustrations, and receive peer encouragement and solidarity. They noted that these communities are essential for them in dealing with the dual pressures of societal expectations and

entrepreneurial challenges. Where the emotional support from these networks often translates into increased confidence and persistence in business pursuits. We noted that these community networks extend support beyond immediate social circles, providing opportunities for promotion and networking and enhancing business visibility and growth potential:

“Yakjut Facebook group that we have is like a lifeline for us. This group is a place to share business tips—here we vent our frustrations, learn from each other, help in giving shout-outs and increasing business reach, and become a support for one another.” — (P11)

They mentioned that further support from these networks often leads to word-of-mouth marketing, which helps expand business reach.

6.6.3 Role of Technology in Business Operations

Leveraging Multiple Platforms to Build Supply-Chain Infrastructure

Our participants pointed to the importance of using platforms (e.g., Instagram and Facebook) which are key to their business growth and value, particularly for small enterprises and first-time sellers. Through our analysis, we noted that social media is seen as more than a supplementary tool, as it acts as an essential enabler of business expansion and customer acquisition in the digital economy. Our participants noted how the affordances of social media allow businesses to reach a broader and more diverse audience effectively. It facilitates business setup with a reach that surpasses the one possible via physical business:

“Social media, particularly Instagram has played a major role for my venture. It’s the only source where I showcase or exhibit my calligraphies and people place an order there only.” — (P4)

As mentioned in the above findings (section 6.6.1), our participants particularly highlighted the transformative power of social media-supported entrepreneurship, which came to the fore during and after the COVID-19 lockdown, allowing businesses to navigate traditional market constraints and continue operations. Often, our participants would leverage multiple platforms with specific affordances to engage their intended audience with particular media to enhance their business. For example, Instagram is primarily used to engage with the audience using multiple content showcasing modalities (e.g., pictures, short videos, and stories),

while YouTube is leveraged to showcase products at length with extra details. For example, P5 shared, “*I manage YouTube and Instagram. I post large videos of dresses on YouTube. Mainly, I work on Instagram.*” Moreover, the traditional means of acquisition of raw materials (if required for the business) has also shifted online, and interestingly, social media has become the search engine. These platforms, such as YouTube and Instagram, are not only used to run and showcase businesses to customers or clients but also serve as essential tools for sourcing materials, learning about seller and product services, and directly reaching out to sellers to procure business-related products and connect with other businesses:

“We searched for sellers on YouTube and Instagram to see where we could find them. We also searched for products, whoever was selling them, we reached out to the owner. We found their name and number on Instagram, then called them.” — (P2)

Managing Business Operations

We found that these entrepreneurs leveraged social media platforms to enhance operational efficiency and customer interaction, which are critical elements for the success of online businesses. For instance, they predominantly use digital payment methods like Google Pay³ and mPAY⁴ to reduce reliance on cash on delivery, thereby minimizing the risk of last-minute order rejections—a common challenge for small businesses—and ensuring secure transactions. Securing advance payments, in particular, is a common strategy deployed by our participants to avoid fraud. It is achieved by requiring at least half of the payment upfront from the customers to cover initial costs and mitigate potential fraud. Additionally, we found that these entrepreneurs employed innovative strategies such as open-box delivery options, where customers are encouraged to share a video of the product while unboxing it. This approach caters to customer preferences, enhances trust, and facilitates exchanges or refunds for items like costumes, reducing the likelihood of fraudulent returns. We also noted that while many of these businesses used manual order tracking and management strategies such as telephonic confirmations, only a few utilized online order tracking and courier tracking applications. P11 specified, “*We have tie-ups with a local delivery guy. He handles deliveries in Srinagar, while other orders are shipped through FastBeetle or DTDC. We also ship overseas.*” For delivering their products, they typically rely on local and other standard couriers with partnerships such as those

³https://pay.google.com/intl/en_in/about/

⁴https://www.jkbank.com/pdfs/mobile/MBank_USERS_ONLY_20NOV_2013_UP.pdf

with FastBeetle⁵, ensuring quick and cost-effective distribution within different geographies.

Navigating Visibility with Algorithms and Online Communities

Participants with the affordances of social media platforms try their best to reach a broader audience (section 6.6.3). Moreover, knowing that algorithms run these platforms, our participants navigate them with their own strategies to enhance business visibility. They discussed how their specific strategies — such as daily posts, mastering the use of hashtags, and collaborating with influencers — are vital for boosting visibility and fostering audience interaction. Our participants have developed their own folk theories [322, 323]. Aside from algorithmic navigation, they have also developed other marketing strategies, such as leveraging customer recommendations, which is critical for acquiring new business through word-of-mouth referrals and reviews. Influencer and partnership strategies are also pivotal, as businesses closely monitor market trends and collaborate with successful accounts to tailor their offerings and maintain competitiveness. These collaborations often involve influencers promoting the business’s products to their large follower base, significantly boosting visibility and growth. Our participants also adopt content strategies like consistent posting and content diversification to align with platform algorithms and maintain audience engagement. These strategies include regular posts with images, reels featuring short, engaging videos set to trending background music, temporary stories, and live sessions where they interact directly with their audience, showcase products, respond to queries, and more. This process often involves trial and error, such as experimenting with business account features and hashtag usage, to refine these strategies:

“First of all, consistency is key for Instagram Algorithm. Second, you need to put up ads and constantly post stuff, especially reels. Plus, collaborations work a lot – that leads to a lot of promotion” — (P16)

Furthermore, they highlighted the importance of localized social media groups, networking, and community engagement — both physical and digital—in sourcing products and building business connections, which are essential for driving growth on social media:

“I am mostly active for my business on Instagram, but I also have pages/accounts on Facebook and WhatsApp. Also, I am consistent in a Kashmiri ladies group. I post my artworks there

⁵<https://www.fastbeetle.com/aboutus>

as a verified seller and showcase my artworks in the art category as well. Plus whenever any member of the group is in need of any gift, I am consistent in suggesting her to buy my artworks.”

— (P6)

6.6.4 Navigating Platform Challenges, Content Creation, and Online Risks

Platform-specific Challenges

We noted that one of the most pressing issues entrepreneurs face is the inconsistency in platform engagement. Social media platforms like Instagram and Facebook can exhibit unpredictable fluctuations in reach based on their respective algorithms. Our participants assert that the way you interact and post leads to algorithmic change, which in turn leads to a sudden drop or rise in visibility. They mentioned that such fluctuations lead to decreased customer interaction (e.g., views and likes) and overall business slowdowns (e.g., fewer orders). This volatility forces entrepreneurs to be constantly adaptive, often relying on consistent paid promotions to maintain a steady flow of engagement. This algorithmic volatility often stems from the dynamic nature of platform features like Instagram’s Explore page and Reels, where content visibility is heavily influenced by engagement metrics and trending formats. They recounted constantly experimenting with these features, learning that consistent posting and adaptation to popular formats were crucial to maintain reach, even if it meant investing in paid promotions to stabilize engagement. For example, P2 said “*we initially faced challenges like not getting likes, customers, or orders. To overcome this, we started doing promotions, asking friends for shoutouts on stories, and paying influencers for shoutouts.*” We also noted that specific platforms present unique operational challenges. For instance, WhatsApp heavily depends on a robust contact list for business efficacy, which entrepreneurs must often build either through their own social capital or leveraging all potential customers in their social media networks. Without an extensive contact base, sustaining business operations on WhatsApp is particularly challenging, especially for women who face restrictive socio-cultural norms and limited public interaction. Their social capital is often confined to family, friends, and relatives, making it difficult to expand their business reach on WhatsApp. The platform’s effectiveness relies heavily on an extensive contact list, which makes it hard for them to develop under these constraints:

“Challenges are mostly related to marketing. Women often have a very close-knit niche, which makes marketing challenging. Although social media combats that, but still gaining followers

being a women has it own challenges.” — (P5)

Content Creation Challenges

Among our participants, we found that content creation stands out as one of the most resource-intensive aspects of digital entrepreneurship. Producing high-quality visual content, such as detailed product videos, demands significant time and effort. For example, creating product showcase videos requires detailed planning, scripts, multiple shots, and extensive editing skills and training. These tasks, though time-consuming, are essential for making products visually appealing to potential customers, and for them, balancing this creative work with the other demands of running a business, especially for small teams where these entrepreneurs handle everything, becomes a challenge. As they shared, a steep learning curve is initially involved—tools like Lightroom, unfold, or video editing applications are complex and often have paid features that can take time to master. They mentioned that it often takes time and can be overwhelming at first, with many features remaining untapped because users simply do not know how to utilize them fully:

“I am learning and trying to engage my audience through reels of my products. For that, I have been learning product videography and photography skills from YouTube. Since I am a beginner at this, I remember that for the first reel, I mean like the professional one, it took me almost the entire day because I had to set up, arrange lighting, fix the tripod, shoot from different angles, and then go for editing. Editing seems fun but it at the same time demands skills, and huge time from you and lots of energy.” — (P6)

This constant juggling act often leads to burnout as they struggle to keep up with the demands of content production while managing other aspects of their businesses. Additionally, we noted that digital marketing is far more complex than simply posting content and waiting for customer engagement. It requires extensive planning around themes, timing, and audience targeting. Participants mentioned that while paid promotions are necessary for boosting visibility, they can sometimes backfire by attracting unwanted audiences, such as those who engage in inappropriate harassment or leave hateful comments, often failing to convert views into actual sales. The competitive nature of the market, coupled with the saturation of low-cost competitors, further complicates digital marketing efforts, making it difficult for entrepreneurs to stand out and maintain their market share:

“It is pretty complex. It’s not like you just upload a photo, people like it, and you get work. You need to plan shoots, themes, and the timing of uploads. The reach has to be good. If it isn’t, it all goes in vain. Often, you have to pay money to boost the posts. Sometimes the posts reach a creepy audience. Kashmiri men do it a lot; comments like ‘changed the face, it’s a deception’ type comments would be there.” — (P7)

Online Harassment and Copyright Issues

While online business offers significant opportunities, it also exposes women to substantial risks, including harassment and gender-based discrimination in digital spaces [131, 157]. We noted that one of the issues these women face is the disconnect between customer expectations and the realities of producing artistic and handcrafted work. For example, many customers often perceive that artwork is simple and should, therefore, be low-cost, not recognizing the time, effort, and skill required by small enterprise artists to create each piece. This issue is particularly pronounced in regions with limited awareness of the value of artistic work, resulting in customers being unwilling to pay fair prices and prone to behaving rudely towards the women providing these services. This lack of understanding creates friction, as customers often compare handcrafted items to mass-produced goods, undervaluing the time, skill, and cultural significance involved in the artistic process. This disconnect complicates pricing negotiations and forces women artists to take on the additional burden of educating their customers, diverting their focus away from their creative work. Our participants frequently encountered negative interactions on social media, including harassment and rude behavior from customers. They are often subjected to inappropriate comments, personal attacks, and derogatory remarks about the content they showcase on their business profiles. For instance, people might leave demeaning, inappropriate comments, such as *“you’re spreading shamelessness”* or *“you’re fooling people with such high prices”*. These interactions undermine the women’s confidence and create an uncomfortable environment they must navigate daily. Managing these situations requires a mix of technical and emotional strategies, such as using platform tools to block or report offenders and maintaining a calm and professional demeanor in direct communications with customers. While participants actively utilized platform tools such as direct blocking and reporting mechanisms, the efficacy of these features often proved limited against the volume and culturally nuanced nature of harassment. Derogatory comments in local languages, often tied to societal stigmas as shown in Figure 6.2, frequently bypassed standard moderation, highlighting a gap in culturally sensitive content filters and more robust, localized reporting functionalities.

Moreover, even sharing business contact numbers meant to facilitate customer interactions can backfire, as these numbers often become targets for unsolicited and inappropriate behavior. They reported receiving unnecessary calls, inappropriate messages, and derogatory comments (e.g., comments on a post in Figure 6.2), further complicating their efforts to run their businesses smoothly:

“I receive random spam messages, harsh comments, and derogatory comments on posts—mostly on posts that show a female face or feature a Kashmiri model. Then you would see men writing alot of unnecessary and derogatory stuff regarding the model or the post or my work unnecessarily and to that I mostly block them if they seem fishy or keep spam texting.” — (P17)

Additionally, participants raised concerns about intellectual property and ethical issues. Protecting intellectual property is a significant challenge for digital entrepreneurs, particularly in creative fields like calligraphy and design. Despite efforts to safeguard their work through watermarking or signing, these measures often fall short against advanced editing technologies. The fear of having their ideas stolen leads many entrepreneurs to avoid sharing their most valuable work online, limiting their ability to showcase their talents fully:

“Artworks are more prone to copyright violations. Right now, the most I can do is write a copyright note in the caption; though I know it’s not very effective, I have to take the risk and post my designs. Besides, we calligraphers have a signature that we put on our artwork to claim the copyright, but the risk remains. Some of my dearest paintings haven’t been posted because I don’t want anyone to steal my theme or concept, as they hold personal meaning. I’m looking for platforms where recognition itself can act as copyright protection. Sounds dreamy, but that’s how it is.” — (P6)



Figure 6.2: Example of Harsh/Derogatory Comments on a Business related Post on one of our Participants’ Page. (a) The left side of the image shows actual comments on the post, featuring derogatory remarks in the local Kashmiri language. (b) On the right side are the corresponding English translations of these comments.

We uncovered that their only way to address these issues is by directly confronting users who use their content without permission or copy their ideas, often by personally messaging them. They also mentioned navigating this challenge by sharing stories (e.g., on Instagram or WhatsApp) about their content being copied and directly calling out people regarding this issue. They further seek support from fellow entrepreneurs and friends to re-post callout stories and report the infringing content. However, despite these efforts, they mentioned that these approaches are not particularly effective on social media.

6.7 Discussion

Our findings suggest that social media entrepreneurship holds promising potential for improving economic mobility among women in our context. While HCI research has explored how less-educated, lower-income women from resource-constrained contexts engage in crowdfunding and gig work [373, 230]. Our study presents a different demographic, well-educated women with access to technology, whose ventures often stem from contextual challenges such as rising unemployment and limited job opportunities [388]. Our context is particularly compelling as it has historically been a socio-politically disturbed region, affecting nearly every aspect of development [386, 389, 387]. Consistent with Wani et al.'s work [388], our research shows how women who are often marginalized and underrepresented in the workforce face additional challenges in such environments. While social media platforms provide substantial opportunities for women, these are often constrained by socio-cultural, religious, and patriarchal norms that influence and sometimes stigmatize their business practices.

This highlights the need to recognize social media platforms as vital tools for supporting women, as they offer lower infrastructure costs and fewer entry barriers than traditional businesses. We uncovered the presence of spatial politics where physical business spaces requiring higher investment and logistics costs are often perceived as male-dominated territories. Our findings point to an opportunity for the HCI community to explore socio-technical solutions that address the challenges and open new avenues for developing robust, contextually relevant infrastructure to support women entrepreneurs better. Building on this, our discussion will address these considerations and provide directions into scaffolding strategies and design pathways to enhance social media entrepreneurship by improving the platform's capabilities and strengthening community tech infrastructure. These pathways are focused on designing culturally attuned and contextually productive resources, ensuring that proposed solutions are responsive to the unique societal norms, political

realities, and digital marginalization experienced by women entrepreneurs in this region.

6.7.1 Design for Advanced Privacy Controls and Moderation Tools

Strong business presentation and brand imagery are crucial for shaping consumer perceptions and standing out in a competitive market [229]. While our participants actively maintain their business identities and visibility on social media to grow, this visibility comes with challenges. Consistent with research in HCI and CSCW, our findings foreground the heightened risks digital spaces pose to women online. Compared to men, women are more vulnerable to harassment, negative reviews, stalking, and other forms of online abuse. Research highlights that gender significantly impacts digital security and privacy experiences, placing women at unique structural disadvantages [131, 299, 3]. Our findings also reveal that in our context, women can be further marginalized or pushed to the periphery based on how they present their business identities online. Drawing on Erving Goffman's work on identity [126], which views identity as fluid and shaped by social contexts, we found that societal pressures can harm their business and personal reputations, leading to community criticism. To navigate this, participants carefully balance cultural and religious norms while maintaining business visibility. Though they adapt strategies to preserve credibility and avoid professional isolation, they continue to face challenges around privacy and harassment.

Research on improving women's experiences in online spaces within patriarchal societies, such as Pakistan, underscores the importance of digital safe spaces [410, 11, 257]. These studies highlight the need for closed, moderated social media groups to foster safe discussions, reducing the risks of harassment and privacy violations prevalent in mixed-gender spaces. They present these spaces as alternatives to the harassment women often encounter online (ibid). While these recommendations offer protection, they may not be practical for women running online businesses, as they could limit the necessary reach and engagement. Social media visibility often depends on open accounts that encourage user interaction through shares, comments, and likes. This open nature of social media visibility creates a paradox — women need public engagement to grow their businesses but also wish to avoid scrutiny and harassment. We build on literature advocating for enhanced privacy controls and moderation tools. We argue for a broader approach beyond the concept of closed groups to ensure privacy, security, and moderation in online spaces. We recommend platform designers implement advanced privacy settings and robust moderation tools, allowing users to better filter, report, and manage unwanted interactions more effectively. One possible way could be the introduction of customizable privacy settings features that could provide greater control over who interacts

with their content while taking care that their business visibility is not compromised. For example, adding geolocation-based visibility settings can limit content exposure to specific regions, offering protection in areas of heightened scrutiny. Also, providing in-platform resources on privacy and security best practices, including tutorials and risk awareness, would help women safeguard their online presence.

Moreover, for online harassment, we draw from literature on content moderation in digital spaces [123, 319]. Our findings offer evidence that current moderation tools require redesigning to be more effective for diverse global audiences, particularly for women entrepreneurs in our context. While standard content moderation techniques aim to reduce harmful content, they often fail to account for the socio-cultural differences between users in the Global South and those in Western countries [319]. For example, Shahid et al. highlight how Western-centric moderation strategies overlook cultural nuances, leading to inappropriate content moderations. They argue that these systems often misinterpret local nuances due to a lack of local context understanding by both automated algorithms and human moderators [319]. We also joins this line of work and advocates to enhance online safety and support the growth of women-led enterprises by advancing moderation efforts. For example, our findings highlighted how current platform moderation fails to handle local language derogatory comments (see Fig 6.2) on a woman's post. Thus, it becomes crucial for the HCI community and the platform designers to develop more sophisticated contextually aligned natural language processing (NLP) methods for content moderation. For example, these methods should be capable of recognizing and blocking inappropriate comments through the use of diverse datasets that include local language derogatory terms, allowing users to tailor blocklists to their specific cultural context. Moreover, strengthening the human infrastructure by strengthening partnerships between local researchers and tech giants to improve content moderation efforts integrating teams with deep local knowledge is essential for crafting moderation strategies that are not only effective but also culturally sensitive. By aligning moderation tools more closely with the unique needs and challenges faced by users in regions with local language, we advocate to foster a safer and more supportive environment for women entrepreneurs, enabling them to thrive in the digital marketplace while maintaining necessary visibility.

6.7.2 Scaffold Learning and Skill-Building

Content creation and marketing skills are essential for building visibility and driving online business growth, but women in our context faced significant challenges. Research in HCI and CSCW has contributed to capacity and skill-building efforts through collaborative learning, skill development, and knowledge sharing

across domains like education [374], healthcare [404], and professional development [225]. We noted that women faced difficulties with limited skill-based learning resources and complex content creation tools, hindering their ability to utilize all features and create high-quality content for business growth. This gap presents an opportunity for the HCI community to build on research and design contextually relevant learning resources that enhance the skills of women entrepreneurs using digital platforms. Previous HCI research, especially in resource-constrained and socio-culturally challenging contexts, has investigated community capacity-building [201], which resonates with our context. Despite forming informal support communities, we noted that these women faced challenges with the requisite skills to grow their businesses. Their success, however, has also inspired other women in the region to explore social media entrepreneurship, underscoring the need for skill-building resources. The Indian government has already invested substantially in technology education through initiatives e.g., NPTEL, which prepare individuals for lucrative careers in fields like AI [263]. There is a similar necessity for fostering entrepreneurship. Developing free, locally accessible courses in entrepreneurship skills could enable more people to learn essential skills needed for successful business ventures.

We build on the literature in skill-building by advocating for developing contextually aligned tutorials and resources on marketing strategies and content creation. We suggest that developing these resources is essential as women from contexts like ours with limited job opportunities have found these platforms a valuable source of economic empowerment. The more resources and learning opportunities available, the better it will be, as this will enhance the viability of digital entrepreneurship as a legitimate and lucrative career path; otherwise, often dismissed as a mere sideline rather than a substantial employment option. Further, we also draw inspiration from Julie et al.'s concept of "reciprocal capacity building", a culturally sensitive approach that fosters mutual benefits through knowledge exchange between experienced and aspiring community members [153]. In our context, the expertise of established women can significantly support aspiring women entrepreneurs as they learn from one another. These women are already adept at navigating socio-cultural and religious norms, carefully balancing their business identities and online content. Their experiences and knowledge can be invaluable resources for each other. For this, one possible approach could be leveraging social media platforms to create dedicated spaces for peer mentoring, resource sharing, and strategies for content creation, marketing, and other essential business operations. These spaces can serve as both learning sites and support networks, reflecting from our findings of how these women rely on digital connections for mutual support. Additionally, platforms like Instagram can introduce easily accessible train-

ing modules and resources focusing on mastering social media strategies, content creation, editing tutorials, and leveraging algorithms to support aspiring entrepreneurs in launching and growing their ventures.

6.7.3 Policy Implications

HCI and CSCW have some history of their engagement with policy, but it is not much prevalent⁶, as argued by Jackson et al. [165] - “too often (when policy is thought about at all) it is imagined to come after design and practice, in both time and importance”. Technologies keep emerging and evolving, with this unstoppable evolution, our practices and approaches require significant thought, not only on the level of design, but also on policy and practice. We echo, Jackson et al.’s [165], call for bringing policy at the forefront of our praxis, because “emergent technologies may suggest problems and possibilities for both social practices and the formal rules and institutions that govern them” [165]. Though, we argue that what is most critical in the implementation of policy or researching policy actively within HCI/CSCW is not just the temporality, but also the spatiality. We build on their argument that policy should be dealt with at the forefront in the ‘policy knot’ [165], but the spatial awareness of this implementation is the key to avoid any neoliberal solutionist traps. It is not that Jackson and colleagues did not engage spatially, but their key contribution and argument advocated for temporality. We unpack both aspects, temporality and spatiality, in the next two subsections. First, we engage with Meta’s business funding policy in India, to argue for bringing spatial awareness in policy implications. Second, we engage with copyright law in the Indian digital economy, supporting Jackson et al.’s [165] argument.

Infrastructure as Policy Intervention

The woman expressed strongly how their work, especially when they are beginning their entrepreneurial journey, is not considered as “serious” or “just a hobby,” thereby lacking initial support from friends and family. Support typically materializes only after they gain traction on social media or when demand for their business visibly increases. This demand is not quantified but is rather assessed subjectively, such as by observing how busy the women are or how much assistance they seek from male family members. From an economic standpoint, increased demand for a product or service can lead to profit. So, how do we work with these women, to support them and their families from the early stages of their entrepreneurial

⁶It should be noted that when we are talking about policy, the idea of organization and structure automatically comes into play. While it is true that, HCI has not actively addressed Policy for a variety of reasons, but HCI has indeed address and studied organization, which is evident in HCI’s wave 2 [142, 59].

journey? From an HCI perspective, despite our efforts to immerse ourselves in their context [363], we [researchers] remain outsiders and, at best, are subject matter experts somewhat removed from the actual lived experiences. Sultana et al. [343], and Wani et al. [389], both, guide us to adopt a very careful and community-oriented approach, i.e., designing *within*. This approach is suitable if we are to come up with a potential workaround to support these women, but it is not that simple. The cash flow in our context is influenced by various factors, and designing community interventions for transformation in areas like health or education differs significantly from financial workarounds. Given that our context has faced numerous catastrophic events for decades [163], the concept of capital is deeply intertwined with the material realities on the ground.

Jackson et al.'s work, while underscoring the importance for HCI/CSCW researchers to uptake policy actively, argued that – “design that fails to take account of policy is likely to be bad design; or that user practices that ignore the policy frameworks around them are likely to prove practically or legally unsustainable (though both these things are true). [...] these worlds are practically speaking inseparable. Design operates in the shadow of practice and order, whether those figures are represented through the mechanisms of user experience research, or memos from corporate legal departments, or in the hunches and intuitions of the design team.” In short, it is “messy”, but design as a monolith does not serve us in the long run, because it is ultimately part of the larger infrastructure. We urge HCI/CSCW researchers and designers to reflect and engage with this very messiness, where we should ask (*what if*) — **what if the infrastructure intervenes?** That is to say, instead of designing and intervening locally at the site of concern, where various social norms and potentially relationships could be affected leading to harm, what if we design for context-specific policy at the level of technical industry/infrastructure?

For example, government, industry, or non-profit grants are typical funding sources for individuals, groups, and organizations. Particularly, in India, the start-up and entrepreneurship landscape has seen a notable increase, with a significant rise in the number of grants and funding [114], but most of them cater to very specific industries, such as technology. While there are grants available for small businesses, they are relatively few. Meta has launched several initiatives to support small businesses and content creators on platforms such as WhatsApp, Instagram, and Facebook [246, 247]. For example, in 2021, the Small Business Loans Initiative was launched, enabling third-party lenders to offer loans ranging from 30,000 INR to 1 Crore INR, some at a 0% interest rate. However, this rate is capped by a loan limit and varies by lender. Additionally, these grants are primarily aimed at helping businesses advertise their brands on Facebook and

Instagram [246, 247]. Even though the interest amount is covered by Meta, but the question from a policy perspective is: who does it really cater to? From a temporal perspective, this is timely intervention by the technical industry who are supporting their users and the business mutually. But if we look at it from a spatial perspective, where is this policy being implemented? Most of these loans are being granted to people who already have access to bank accounts with certain national banks in India, and moreover, have acquired a credit card, as per their policy. It should be noted that access to credit cards is a privilege, as per Reserve Bank of India, there are around 100 million credit cards in circulation, meaning only around 7-8% of the Indian population (out of 1.4 billion people) has access to credit cards [268]. If we were to ask how many of them are women, the number would be even less. So the very basic requirement to apply for such grants is already limited by the institutional and economical factors. This is neoliberal solutionist trap, which could be avoided if we consider spatiality along with the temporality of the policy intervention. Advertising in one aspect of business, and focusing solely on it overlooks critical business aspects like skill development, material acquisition, and logistical support, which our findings emphasize are important. As HCI/CSCW scholars, we urge our community to actively investigate such policies, especially asking, *cui bono* (who benefits?) [338]. These current financial policies at present are more “third-party” centered, than “human-centered”, operating on the assumption that people will have easy credit card access. This can be unrealistic in our context as these women experience gendered mobility restrictions, and accessing credit cards from even a family member could be a distant reality. But if such technical infrastructure-level policies can be designed to circumvent such limitations, it could potentially lead to more autonomy amongst our participants. Not only it provide them access to capital from the beginning, but also the sense of pride amongst their family member to garner support early on.

Digital Economy and Copyright Law

Social media platforms, due to their open nature, often expose content to copyright infringement, a widespread issue in the digital world [283]. In India, the Copyright Act of 1957 grants creators exclusive rights to their creations and ensures protections such as “fair use” or “fair dealing” [185]. Our findings indicated that women entrepreneurs were particularly concerned about protecting their creative artwork, e.g., calligraphy art. This concern leads to a negative perception and hesitation among them to not post their creative pieces. Indian copyright laws follow an automatic registration model, where copyright protection is immediate upon creation without needing formal registration. The legal system does encourage creators to

register their products with the Copyright Office, and there is also a distinction between registering with Copyright and Trademark [60]. Thus, a considerable ambiguity arises because the Indian Copyright law does not protect the idea per se, and only protects tangible outcomes [185]. Even though the protections are there, they are ineffective without adequate awareness among those who could benefit from them, e.g., content creators. Also, navigating the legal route creates burden on creators, from acquiring legal counsel to investing personal time. In contexts like ours where career pursuits are initially discouraged and subject to intense social scrutiny, opting for legal action may not be a favorable choice. Further, the judicial process in India is generally viewed as burdensome due to long delays and high costs [4], making people hesitant to pursue lawsuits, especially for minor offenses, such as digital copyright infringement.

Moreover, lack of legal knowledge, inadequate platform support, and societal stigma against legal recourse have led these women to develop their own workarounds to navigate these challenges. For example, confronting users and creators who appropriate and use their creative work either via sending them DMs, or calling them out in public groups online. The workarounds get mixed results, hence cannot be solely relied upon. HCI/CSCW should treat this as an active area of research and a site of intervention. Fiesler et.al, in reviewing the landscape of copyright law and online communities, called on researcher and designers in HCI to actively investigate the issue of copyright at the forefront [110]. We build on their work to highlight two potential implications for design: a) while social media platforms have existing copyright policies and guidelines, it is essential to go beyond mere terms and conditions. That is to say, we should not only design accessible copyright law guides for the creators but also work on the mediums to educate them. For example, designing small "Did you know?" short-form messages that cover basic and jargon-free explanations. We also suggest that researchers explore advanced watermarking techniques and new emerging innovations, such as non-fungible tokens (NFTs) [132], to resolve copyright issues on platforms, reducing the option to rely on judicial routes. b) cultivating conversational spaces about copyright law [110] and different legal channels, such as town halls or online groups. For example, spaces such as the Facebook group that our participants have created for the women in Kashmir. Future research can investigate how might we re-imagine such spaces to build information and content that could be used in these spaces and spark conversations and learning instead of just "calling-out".

Closing Reflections: This case study contributes to RQ2 by revealing how women entrepreneurs creatively engage with digital platforms to build economic livelihoods, while negotiating gendered barriers and infrastructural limitations. It contributes to RQ3 by identifying socio-technical design implications for platform

features, privacy practices, and community scaffolding mechanisms that can better support entrepreneurship in conflict-affected and gender-constrained contexts. While this chapter focused on digital entrepreneurship as a mode of economic repair, the next chapter explores how the psychological toll of long-term disruption intersects with digital access and community-based care infrastructures in Kashmir.

Chapter 7

Case Study V: Mental Health and Wellbeing

Asra Sakeen Wani, Ishika Joshi, and Pushpendra Singh. (2024). "*Unrest and trauma stays with you!*": Navigating mental health and professional service-seeking in Kashmir. In Proceedings of the CHI Conference on Human Factors in Computing Systems, pp. 1-17. 2024.

CHAPTER 7

CASE STUDY V: MENTAL HEALTH AND WELL-BEING

7.1 Introduction

The growing concern about the influence of mental health well-being on diverse demographics has elicited global attention, underscoring its significance on an individual's overall well-being. The United Nations (UN's) Sustainable Development Goals (SDGs) – SDG 3 addresses global mental health challenges [345]. This, aligned with varied initiatives from the World Health Organization (WHO), World Bank, and International Monetary Fund, emphasizes the need for improved mental health services and advancements [401, 262, 396]. Studies have reported various factors that influence mental health, including socio-economic [47], socio-political [216, 32], environmental [237], socio-cultural [260], biological determinants [281], and lifestyle choices [147]. Disparity in access to resources and mental health treatment services is also a crucial challenge influencing individuals and communities [198, 275]. The field of Human-Computer Interaction (HCI) is increasingly focusing on mental health well-being and its related provisions, as evidenced by various studies [275, 276, 279, 278, 325, 365]. With this, digital mental health tools are emerging as potential solutions to address mental health challenges, with numerous studies exploring their potential and application in providing effective care and support. For example, they have been utilized for early detection of mental health disorders [359, 52], health monitoring [152, 145, 253], online therapy [298, 385, 171], support groups [288, 203, 286], and psycho-education [15, 218]. Additionally, HCI research in mental health has employed ecological perspectives to emphasize and account for various ecological factors at varied levels, playing a role in mental health well-being and illness scenarios [209, 30]. Such research has investigated the roles of caregivers and family members [75, 365, 326], peer networks [51, 78, 71], socio-cultural [275, 278], and socio-political [347, 346] influences in an individual's mental health care journey.

Despite these advancements in mental health care support, individuals still struggle with mental health issues, particularly in areas with limited resources and support [274]. Moreover, the literature on mental health-seeking practices of individuals originating from regions marked by socio-political unrest remains understudied. Furthermore, individuals in regions with prolonged socio-political conflict situations face obstacles to seeking mental health care and assistance. The existing efforts to address mental health care

in conflicted regions become inadequate to meet the needs of the individuals in such regions as each conflict situation is distinct from another, especially when considering the diverse geographical contexts. Our research aims to highlight the distinctiveness of the context with a history of long-standing socio-political unrest, steering away from focusing solely on specific illnesses or specific disruptive events. With this our work underscores these challenges in the context of Jammu & Kashmir¹, India, a region of territorial dispute for decades that has experienced prolonged armed conflict and socio-political unrest [256]. According to research reports, there are increased rates of depression, anxiety, and post-traumatic stress disorder (PTSD) [149, 150] among the population.

Chapter Overview: This chapter directly addresses all three thesis-level research questions. It explores how ongoing socio-political disruption has affected access to mental health resources, highlighting breakdowns in institutional and infrastructural support (RQ1). It also examines how young people creatively navigate these gaps by engaging with digital platforms, peer networks, and informal care infrastructures (RQ2). In doing so, it surfaces design opportunities that respond to the emotional and contextual realities of life in conflict-affected regions (RQ3).

7.2 Background

The prolonged conflict in the region has had severe implications for the region's mental health. It has contributed to various mental health issues among people due to exposure to violence and uncertainty. According to a Médecins Sans Frontières (MSF) survey, around 1.8 million adults, nearly 45% of the population in the Kashmir Valley, suffer from significant mental health issues, including anxiety, depression, and PTSD [149, 150]. The prevalence rates for these conditions are approximately 41% for depression, 26% for anxiety, and 19% for PTSD, significantly higher than the global average [150]. Moreover, there exists a substantial treatment gap where only 10% of people with mental health problems in Kashmir receive treatment due to a lack of mental health resources, a significant barrier to getting help [150]. These gaps underscore the need to understand the context and its mental health state and present an opportunity to design technology solutions sensitive to the population's unique needs.

¹[https://en.wikipedia.org/wiki/Jammu_and_Kashmir_\(union_territory\)](https://en.wikipedia.org/wiki/Jammu_and_Kashmir_(union_territory))

7.3 Research Questions

What are the experiences of the people seeking professional mental health services, barriers, and facilitators that exist in accessing resources in Kashmir? How does the use of technology impact the experiences of the people in Kashmir seeking mental health services?

7.4 Methodology

7.4.1 Participants and Recruitment

For this study, we recruited participants through convenience and purposive sampling [62, 357] approach facilitated by a practicing clinical psychologist at a private clinic in Srinagar. To ensure clarity and alignment of objectives, the research team engaged in multiple online interactions with the clinical psychologist prior to commencing the interviews. Additionally, the first author visited the psychologist's clinic in person to build rapport and gain a comprehensive understanding of the clinic's environment. Based on the psychologists' assessment and knowledge of the patient's mental health situation, the psychologist contacted the participants telephonically regarding the study. They were first informed about the study's aim and asked for their willingness to participate. All participants we interviewed for this study were interested in conversing about our context's mental health-related issues and challenges. Table 7.1 provides an overview of the demographic characteristics of the participants. We provide a detailed description of the data collection process, ethical considerations, and data analysis approach employed in the following sections.

7.4.2 Data Collection

We conducted 18 semi-structured interviews (10 female, 8 male) with the participants from mid-February 2023 - April 2023. All the participants were already clinically diagnosed and were actively seeking professional support and have been seeing the same psychologist for over six months or more. All the interviews were conducted in person, face to face, at a clinic in Srinagar. Initially, three interviews were shadowed by the first author, where the psychologist conducted the interviews. The rationale behind shadowing the first three interviews, conducted by the psychologist, was to facilitate an observational learning process for the first author. This approach aimed to provide the first author with an in-depth understanding of the psychologist's conversation-conducting techniques and question-asking approach. It served as an initial training

Name	Age	Gender	Occupation	Marital Status	Clinically Diagnosed
P1	26	Female	Employed	Single	Major depressive disorder
P2	31	Male	Employed	Married	Obsessive compulsive disorder
P3	23	Female	Student	Single	Generalised anxiety disorder
P4	28	Male	Employed	Single	Major depressive disorder
P5	35	Female	Employed	Married	Generalised anxiety disorder
P6	27	Female	Unemployed	Single	Major depressive disorder
P7	22	Male	Student	Single	Generalised anxiety disorder
P8	25	Female	Student	Single	Anxiety and PTSD
P9	21	Female	Student	Single	Generalised anxiety disorder
P10	33	Female	Employed	Married	Obsessive compulsive disorder
P11	26	Female	Employed	Single	Generalised anxiety disorder
P12	28	Female	Employed	Single	Major depressive disorder
P13	20	Male	Student	Single	Generalised anxiety disorder
P14	22	Male	Student	Single	Obsessive compulsive disorder
P15	29	Female	Employed	Married	Major depressive disorder
P16	32	Male	Employed	Married	Obsessive compulsive disorder
P17	25	Male	Student	Single	Generalised anxiety disorder
P18	27	Male	Employed	Single	Generalised anxiety disorder

Table 7.1: Demographics of the participants for the interview. [Case Study V: Mental Health and well-being] phase, enabling the first author to grasp the nuances of participant engagement, probing formulation, and situational context. After this, with all the necessary precautions, care, and permission from the psychologist, the first author conducted all the other interviews. We asked questions around five distinct themes: a) their experiences with access to mental health services and resources, b) the cultural beliefs and attitudes towards mental health — e.g., the perception and stigmatization of mental health issues in Kashmiri society, c) barriers and facilitators to accessing mental health services, d) impact of political unrest and COVID-19 and, d) role of technology, social media (e.g., Helplines, Facebook, WhatsApp, etc.) in seeking mental health support. All participants were informed about the study’s purpose and assured of anonymity. Written informed consent and demographic data were collected from them. Participation was entirely voluntary, and no compensation was given to the participants; however, we paid approximately US\$ 6 as clinical service charges per session. Each interview lasted between 1 to 2.5 hours. All the interviews were conducted in a mix of Kashmiri, Urdu, and English by the first author as per the participants preference. The first author’s mobile device was used to audio-record the interviews with the prior consent from the participants. Four participants did not let us record the conversation, as they felt comfortable talking and sharing more without getting recorded but notes were taken for these sessions. The data was collected in the form of audio notes and field notes with prior permission from the participants. To protect the participants’ privacy, the collected data was anonymized and then shared securely only with the research team involved in the study. For analysis, audio recordings were transcribed and, when needed, translated into English.

7.4.3 Ethics

Our Institute Review Board (IRB) approved this study in Delhi, India, and the study protocol underwent additional scrutiny by the practicing psychologist. We ensured that special attention was devoted to minimizing potential risks to the participants. Throughout the interview process, special care was taken to ensure the participants' comfort before, during, and after the interviews. The participants were briefed about the study and informed that they could leave the conversation whenever needed. They were informed about the study, the nature of data collection, and how it will be leveraged in the future before the interview session. Post this, both written and verbal consent were received. After discussing sensitive details, we inquired about the participants' well-being to ensure their emotional state was not adversely affected. Adequate breaks were provided between interviews when deemed necessary. After each interview, participants were asked to remain for a brief period in case they experienced any emotional distress, and they were informed of their right to seek support from the psychologist within 48 hours of the interview if they felt any discomfort due to the conversation. By adhering to these precautions and practices, we aimed to create a secure and supportive environment for the participant's involvement in the study.

7.4.4 Data Analysis

For this study, we first transcribed the 38 hours of interview data and shared the data with the entire research team. The transcribed data was subjected to iterative inductive thematic analysis [40, 41]. The initial phase of analysis was carried out by the first two authors, who reviewed each transcript separately and performed line-by-line open coding of all the transcripts. The codes were then reviewed and aligned as a group to ensure consistency. Collectively, the research team was actively involved in this process. For instance, the example codes were, "*stigma and secrecy around mental health issues*", "*importance of social support networks*", "*social media as a source of information*". These codes were clustered into the axial codes and met to discuss and generate higher level codes, for instance, — "*impact of socio-political influences*", "*recognition of the need for help*", "*usage patterns, and challenges: role of technology in seeking support*" etc., based on the observed and prominent patterns in data. Finally, we arrived at broader themes such as "*mental health struggles rooted in context*", "*moving forward and embracing support*", and "*patterns, challenges and expectations of utilizing technology for mental health support*". Tools like Miro-board² and

²<https://miro.com/>

Google Sheets were employed to aid the brainstorming and theme construction process.

7.4.5 Study Limitations

We acknowledge the limitations of our study, and we discuss the same in this section. Participants were recruited through a qualified clinical psychologist which helped ensure ethical screening but also shaped the profile of individuals included in the study. We relied on purposive and convenience-based sampling guided by the psychologist's assessment of participants' readiness and stability to discuss their mental health experiences. Our study sample consisted of individuals who had the means to seek support for their mental health concerns, possessed access to technology, and were familiar with online platforms. Due to the sensitivity of the subject, investigating mental health and well-being within a population with limited access to mental health support, technology, and awareness was not feasible. We acknowledge the need for a more expansive and diverse sample (e.g., varied socio-economic backgrounds, religious groups), encompassing a broader spectrum of perspectives, to yield further valuable insights. Future work should explore the perspectives of digitally-excluded individuals, informal caregivers, and mental health practitioners to inform the design of inclusive and contextually grounded mental health infrastructures.

7.5 Findings

In this section, we offer an understanding of the unique socio-political and socio-cultural challenges in seeking mental health support in Kashmir, detailing individuals' strategies to navigate obstacles and the use of technology for mental health support.

7.5.1 Mental Health struggles rooted in the Context

Impact of socio-political influences

We observed that in our study context, the politically complex nature of the region has resulted in people normalizing and accepting their mental health situation as the norm, affecting their approach to seeking mental health support. All the participants highlighted that the region's political unrest, disruptions, and uncertainty have significantly contributed to the prevailing mental health issues in the region. They emphasized that mental health issues often get overlooked and neglected because the situation demands immediate focus on other daily necessities and survival priorities. As explained by a participant —

“obviously, it (mental health) has been impacted because the focus is never on our mental health or well-being; it is rather on other things, so it has been impacted.” (P2, Male)

Our observations indicate the presence of embedded fear and profound concern among the people regarding security risks to their lives due to the ongoing political situation. The participants described that the influences of unrest and frequent shutdowns³ have resulted in economic hardships, which, in turn, have led to mental health issues within the community. We found that these shutdowns not only have an economic impact but have contributed to feelings of isolation and disconnection from the outside world among the people, leading to adverse effects on mental well-being. Our participants mentioned that prolonged home-bound experiences during restricted movements due to lockdowns exacerbate the prevailing challenges and impact mental well-being. Additionally, the internet disconnection during the lockdowns has added to the burden of mental health issues among individuals in the region, making them adaptable to the region’s situations. Participants emphasized that these political complexities pose a threat to lives and give rise to insecurities, leading to constant worry and uncertainty surrounding their safety, heightened stress, anxiety, and trauma, making it increasingly challenging for people to seek and access mental health support. As described by a participant —

“... if you leave late from the office, you think you can be stopped anywhere; ID cards are often checked... checkings happen more often... Recently, a gun was pointed at one of my colleagues, so he was scared of coming to the office...and it scares me...these things always remain there subconsciously in my mind...” (P1, Female)

Furthermore, we noted that the individuals living in the region have had firsthand exposure to violent and traumatic events, contributing significantly to the community’s mental health challenges. As explained by a participant —

“...even when we used to go to tuition centers, I’ve seen firings and bullets... we used to go to hide in some neighbor’s places... those impressions are in my mind, and they affect you really deeply...” (P3, Female)

In addition to the exposure to violent, traumatic events, we found that the people in the region have witnessed

³Shutdown here usually refers to a deliberate closing or cessation of everyday activities, often in response to political or social events. It can include curfew, internet and communication shutdown. We use shutdown and lockdown interchangeably in this paper.

grief, loss, emotional shocks, and the killings of people they know or someone close, leaving hidden but deep marks on their psychological health. As mentioned by a participant —

“my classmate in college got killed. I used to see him in the bus daily, which was shocking when I got the news. It does impact somewhere.” (P3, Female)

We also noticed that individuals who have personal lived experiences of exposure to violent, traumatic events experienced during cordon and search operations (CASOs)⁴ live at a considerable risk of developing PTSD and trauma leaving deep, long-lasting memories of emotional shocks and grief on individuals. As described by a participant —

“...we had this CASO in our area...my kid was in school...cordon in my area started everywhere...my kid had not reached home...during that period nobody is allowed to come inside to that area or go out from that area...that builds up stress and trauma in you. . .” (P5, Female)

We observed that among our participants, there is a general understanding and acceptance of disruptions’ direct or indirect impact on mental health within the community. They mentioned that threats and insecurity arising from the ongoing political situation outside Kashmir significantly impact mental health, raising serious concerns about their Kashmiri identity outside. As described by a participant —

“kashmiri’s are looked at with suspicion outside, then you have to prove your loyalty. So this unrest and trauma stays with you. . . crises spills beans on your psyche and affect you too much.”
(P4, Male)

Impact of socio-cultural influences

Besides the impact of socio-political influences on mental health in our context, we identified that cultural and societal conditioning also significantly impact mental health, leading to unnoticed and unaddressed mental health issues among the population. As reported in the prior literature, our observations also confirm the lack of awareness, limited availability of resources, and identification of symptoms contributing to the widespread non-recognition and trivialization of mental health conditions within the region’s general population. Our participants mentioned the challenges exacerbated by the general absence and lack of a

⁴<https://www.greaterkashmir.com/todays-paper/from-crackdown-to-caso>

localized community vocabulary around mental health disorders, resulting in constrained expression and communication surrounding mental health matters. As shared by a participant —

“... here, people didn’t even know that mental health issues can be treated... people are not even aware of the availability of services... the awareness is still lacking among the people.”

(P2, Male)

We also noted that influences like societal understanding, cultural practices, and perspectives play a significant role in shaping help-seeking behavior for mental health issues, as reported by the literature. In our study context, inadequate awareness and understanding of mental health have been reported to result in initial family resistance and a lack of support when seeking help for mental health issues. This resistance is influenced by perceptions and guarded attitudes toward mental health problems. In our study context, we observed common reluctance to disclose mental health disorders due to stigma and taboos as discussed in mental health literature. The stigma, linked to labeling and stigmatization, compels individuals to keep their mental health issues hidden, contributing to broader community unawareness and misunderstanding of these concerns. We also identified that societal expectations and gender dynamics significantly contribute to mental health challenges. Stigma and cultural beliefs surrounding mental health exacerbate the difficulties faced by individuals, with females being particularly affected. For instance, if a female of marriageable age experiences mental health issues, it can hinder her prospects of finding a suitable match due to prevailing societal perceptions. As explained by a participant —

“an irony I recently realized, especially in Kashmir, if you are a girl of marriageable age, you are not supposed to say that you have some mental health disorders, then no one will marry you...” (P15, Female)

In addition to socio-cultural factors, personal preferences, religious beliefs, and practices significantly influence how the community perceives and responds to mental health issues. Any individual’s mental health issues are often attributed to the predominant belief that the individual is possessed, has had an evil eye, or has black magic-like influences instead of any mental health issue. We also noted that a lack of religious adherence, such as not praying five times daily or skipping prayers, is associated with mental health problems. People often interpret deviations from religious norms or sins an individual commits as potential reasons for mental distress. As described by a participant —

“if I tell my parents, I feel that I am having anxiety, they will tell me you should have offered Namaz (prayer); it’s because you don’t offer Namaz, that’s why it happens to you. Pray, and everything will be fine” (P7, Male)

We noted distinct personal and religious beliefs around psychiatrists and therapists influence seeking mental health support. We saw a dominant preference for male psychiatrists within the community, for them being considered more competent as doctors and prescribing medicines. However, female psychologists are preferred when it comes to therapists, primarily driven by personal choice and perception of them offering more empathetic care. We found that seeking support from a therapist was also mainly driven by religious considerations among females. We observed females associate discomfort with lengthy therapy sessions involving extensive communication, particularly with professionals of the opposite gender, influenced by cultural and religious norms. The predominant notion is that discussing personal and sensitive matters with someone of the opposite gender is perceived as inappropriate or against religious norms. Moreover, female preferences were also shaped by distressing experiences of inappropriate advances from male professionals taking advantage of their mental health conditions and vulnerabilities. A participant shared —

“I prefer a male psychiatrist...But for a therapist, you have very long sessions, you have to talk a lot, and a lot of times, you are not really comfortable talking about issues with the opposite gender. I think religion has to play a role and also the social context or the culture we are in. . . in Kashmir we have grown up where we are taught not to have male friends...and, I think religion also permits us to have the bare minimum contact and interaction with male people. . . in ample of cases the concept of transference and counter-transference, like eventually the client or the patient falls for the therapist or something, that’s very true, and I’ve seen in a lot of cases that happen. I tend to prefer a female therapist for me.” (P6, Female)

7.5.2 Approaches and Techniques for seeking help

Recognition of the need for help

As detailed above, the socio-political and socio-cultural context of our participants posed various challenges that can harm an individual’s mental well-being. Nonetheless, we also witnessed shared sentiments of hope and determination to strive for improved mental health and well-being through our participants. Our observations highlight initial coping strategies adopted by our participants when they first observed instability

in their mental health. Several participants talked about disregarding initial signs and perceiving them as temporary challenges that could be overcome by ‘fighting’ them. Activities such as sleeping, staying composed, reading books, and using social media apps like Instagram were mentioned as coping mechanisms that helped individuals to distract themselves. A lack of understanding and acknowledgment of mental health disorders in their peer groups, as also explained before, discouraged them from treating their disorders seriously. A male participant emphasized that he told himself to stay strong and fight the signs of his degrading mental because he is a man and is supposed to face challenges head-on.

“I don’t just use any strategy I just used to you know going to my bed and just sleep not think about it. Sleep has been my coping mechanism to be very honest...” (P2, Male)

Following the coping strategies, our participants discussed that their journeys of seeking help began with acknowledging that they needed help and that their degrading mental health requires attention and care. We noted that our participants sought professional help at stages when their symptoms could no longer be ignored. With that, the importance of having a positive mindset about self-improvement, individual agency, and building resilience against potential negative opinions from peers was emphasized. Participants pointed out that the COVID-19 pandemic allowed them to learn more about mental health issues using social media. The pandemic led many to get exposed to examples of other people struggling with mental health, increased discussions and awareness and made them realize that they were not struggling alone. They emphasized the need to be exposed to such different opinions and examples while going through mental health disorders, as trauma and distress could significantly narrow a person’s perspective and prevent them from grasping the broader context. This exposure encouraged acknowledgment of the need for help and seeking information on appropriate actions to address their symptoms. A few participants also noted that they endured their symptoms until they reached a point where they had no choice but to recognize them and seek assistance.

“pandemic was a blessing in disguise at least this topic was touched multiple times. I think it has been a major topic being discussed in our society after these incidents. It might have reached many people during that time and many might have considered seeking help.” (P8, Female)

We noticed that individuals’ workplaces played a crucial role in recognizing the need for mental health support for some participants. Initiatives like well-being cells hosted in workplaces offer a curated list

of counselors for mental health care. Participants expressed that they were initially concerned about the potential bias and judgment they would face if their mental health status were revealed to their colleagues and managers. However, later on, workplace initiatives became a vital source of information for identifying and obtaining assistance. As a participant explained —

“we had a project called “well being” at the organisation I am working at and I read that document once... I took the permission from lead to text her (psychologist) and that’s how I connected with her... At that time I only knew that there was something going on with me...I was clueless and had no idea regarding seeking help..That document triggered me to at least think about it...” (P1, Female)

Stigma, Privacy Concerns, and Personal Experiences: Navigating Help-seeking

Participants discussed taking up multiple *experimental* routes towards help-seeking. It consisted of going to therapy to give it a try. Many participants expressed initial hesitation about taking prescribed medications due to concerns about potential addiction. They took them only when their mental conditions became intolerable. Patients, despite initial doubts, expressed a strong commitment to improving their mental well-being, taking proactive control of their journey. Emphasis was placed on the necessity of professional psychological assistance and improved access to resources to support the help-seeking process.

“I think you should go first to a clinical psychologist and only if, you know, you cannot, I think you overcome everything by only seeking help from a psychologist rather than going to a psychiatrist. Only if that doesn’t help you then only you can go to a psychiatrist and seek medical help.” (P5, Female)

Participants prioritized their privacy and preferred keeping their mental health status discreet. A participant mentioned not telling anyone about her medications and secretly consuming them. This heightened need for discretion was often amplified by the pervasive stigma and societal expectations surrounding mental health, where any perceived vulnerability or deviation from traditional norms could lead to judgment or impact social standing . We noted that many participants preferred offline and in-person therapy sessions over online sessions, finding personal interaction more helpful than online consultation. Some participants were also skeptical about online help, unsure if their privacy and identity would be kept confidential. This apprehension was particularly pronounced with government helplines, stemming from a deep-seated fear of their peer

groups or the wider community getting to know about their need to seek help through leaked information or detection of their identity via contact information. In a context marked by prolonged socio-political unrest, where general insecurities regarding privacy and information control are inherently heightened, concerns over community judgment can implicitly compound a broader wariness about data exposure. As explained by a participant —

“I did not know who would be there on the other end of the call. I do know people can check through true callers whose number it is. I was scared what if it would be someone who would even remotely know me or know who I am. I did not want to take the risk of sharing my problem with anyone like that.” (P9, Female)

While participants emphasized the importance of going for therapy, they also recalled discouraging incidents that had an unpleasant impact on their mental health. A participant mentioned that her first therapist was cynical towards her symptoms and mocked her for reading too much on Google and concluding that she had a mental health disorder. It was despite her prior clinical diagnosis of the disorder by a psychiatrist. This distressed her further and made her mental health worse. With this, participants highlighted the need for proper licensing and training of therapists as patients are vulnerable to their treatment providers. Challenges with scheduling appointments and communication, unplanned unavailability of therapists, and a lack of seriousness towards their patients also degrade help-seeking experiences. Some participants also mentioned that only a few therapists in the region are well-qualified and genuinely helpful. However, the lack of infrastructure, like professional clinics, restricts their ability to assist their patients, often leading to the need for online sessions due to the unstable availability of supporting facilities. A participant shared —

“... everything to proper scheduling, there are no proper clinics, and the therapists I was seeking before she was taking these offline sessions. And then she switched to the online thing. So I went to no proper clinic here. So a proper clinical infrastructure is not here...” (P6, Female)

Apart from challenges in the therapy-seeking processes, we observed the religious influence on the participants willing to seek help. Participants talked about being asked to go to faith healers or seeing examples of their peers visiting them for treatment. They talked about being forced into going to a faith healer instead of seeking professional help because of limited knowledge about mental health disorders. A participant

mentioned a rare positive experience where, luckily, the faith healer they were forced to go to had studied psychology, and they recommended that he visit a doctor instead. A participant described —

“I was forcefully taken to a faith healer, and luckily that faith healer was educated he had studied psychology, and he told me that this is not a matter of her being possessed by someone but rather take her to a doctor.” (P13, Male)

Aspirations and Hopes for a Better Future

Despite challenges in accessing mental health care, we observe that the Kashmiri youth remain hopeful for a future with improved mental health infrastructure. Here, we report the suggestions and aspirations expressed by our participants. Many participants discussed the need to build an infrastructure that makes mental health support more accessible. They expressed the need for therapists to be commonly situated around the city with enhanced visibility and accessibility. More so, they suggested interventions should be specialized to the requirements and disorders of the patient to provide better treatment. Proposing the need for parallel services that the next generation can access for seeking entertainment and destressing themselves was also mentioned. They added that mental health disorders need as much attention and conversation as the issue of drug abuse in Kashmir to build more awareness. As explained by a participant —

“now there has been a lot of improvement I believe people are talking about it, people are not shying away from talking about mental health problems. But still, you know, a lot can be improved in this area.” (P1, Female)

Participants emphasized the need to improve the existing mental health infrastructure. They mentioned that one cannot find an able therapist easily in Kashmir. Even though helplines have been placed to aid individuals with unstable mental health, many pointed out their hesitation to take online consultations due to the fear of privacy violation. Expressing the need to design solutions considering these fears and usage preferences was emphasized. They also aspired to have such helplines available free of cost with a provision of trustable professionals through these helplines. As a participant explained —

“people don’t have that much reach, these resources are not accessible. No doubt people have got those helplines, or they have got those numbers, but they can’t take online consultations”
(P6, Female)

We noted participants' aspirations to have community-level initiatives to increase awareness around mental health. For example, they mentioned that Public campaigns and Public Health Initiatives similar to existing initiatives for cancer awareness should be placed for mental health awareness to educate communities about symptoms, precautions, and cure methodologies for degrading mental health. They recommended sharing positive examples of individuals suffering from mental health disorders and their journeys to be shared among communities to provide hope and awareness. More so, suggestions of community leaders and famous personas such as preachers or sermons talking about mental health awareness and giving motivational speeches also emerged as ways of creating a dialogue among community members and directing advertisements on television or radio broadcasts as potential vehicles to propagate information regarding mental health to reach a wider audience.

“community leaders giving a speech or sermon [on mental health] during Friday prayers might have a special impact... build clinic's, infrastructure...introduce these concepts to more colleges so that people can learn and then eventually bridge the gap...not everyone can get education from outside...do something so that you can produce therapist and mental health professionals here...” (P4, Male)

Lastly, the aspirations and hopes for a better future remained constant among our findings. Our participants also emphasized the need for the destigmatization of mental health issues. They suggested that this destigmatization should begin right from school, where students should be educated about mental health with as much, if not more, emphasis as they are educated about physical health. Parents should be educated to have a healthy attitude towards the mental health concerns of their wards and pay the needed attention to their concerns. They also suggested that promoting understanding among various generations is essential to bridge the generational gap caused by differing attitudes and perceptions regarding mental health issues.

“I think elders should listen to the younger generation they might be experienced but they should be open to learn more understanding.” (P7, Male)

7.5.3 Patterns, Challenges and Expectations: Technology for Mental Health Support

Usage patterns: Role of Technology in seeking support

We found that our participants utilize the internet and technology for mental health purposes. They often turn to online resources, such as Google Search and YouTube, to seek information about their symptoms, analyze their condition, and gain a better understanding of their mental health. We observed that through online platforms like YouTube, they watch videos to learn more about their symptoms. They talked about seeking comfort in relating to the experiences shared by others in the comments section of YouTube videos. Additionally, we saw that meditation applications and motivational videos are used as tools to promote relaxation and reduce stress. As a participant shared —

“I use an app called CALM its kind of related to nature sounds like waterfall, birds these kind of things you can use for meditate...I Just mainly use YouTube to see motivational videos for example some motivational videos of 5 minutes like of Jay Shetty, or psychology on YouTube...”

(P13, Male)

Our data consistently indicates that social media plays a role in supporting mental health. Participants used technology and social media to temporarily divert their minds from stress, finding relief during tough times. Moreover, during the COVID-19 pandemic, the internet emerged as a vital resource for our participants, facilitating access to online activities previously unavailable during lockdowns. This digital shift offered new opportunities for engagement and helped ease the burden of isolation. We observed that social media became a valuable tool for mental health awareness, with many individuals following mental health-related pages and psychologists on platforms like Instagram. Furthermore, sharing mental health-related posts on their profiles allowed them to boost their mental well-being and contribute to fostering mental health dialogue within their social circles. As is explained by a participant —

“there are a lot of pages on Instagram from psychologists. I used to follow that and it used to give me a little pump for a few seconds only though, but still somewhere you feel a little better about it. But I believe the social media has drastically affected the mental health of people, especially Instagram” (P12, Female)

Participants highlighted using online therapy and helplines as accessible ways to seek assistance and guidance for their mental health challenges. They participated in online mental health discussions on platforms

like Clubhouse by connecting with others and finding comfort in shared experiences and coping methods. These platforms emerged as important vehicles for reducing the stigma associated with mental health. Our observations also reflect that participants took the initiative to reach out to mental health specialists through texts or direct messages (DMs) on social media platforms (e.g., Instagram, Facebook). Engaging with professionals via social media allowed them to establish a first line of contact, making mental health support more approachable and readily available to those in need. As explained by a participant —

“before visiting the doctor physically, I listened to Dr. Aseem (psychiatrist) on a program on DD Kasher, and from that, I texted him on Facebook. Although I did not expect any reply back, I at least tried...” (P11, Female)

Struggles in Using Technology for Seeking Support

Participants also reported some mental health challenges due to technology use beyond the previously mentioned benefits. Our participants consistently highlighted the recurring issue of unavailability of internet access during periods of shutdown as a major source of distress. We observed their heavy reliance on the internet for various activities, e.g., diverting their mind from stress and learning new things. The unavailability of the internet during shutdowns aggravated existing mental health issues and contributed to increased frustrations, thus exacerbating the challenges and affecting their mental well-being. As one of the participants explained —

“in 2019 I used to go insane...I stay stable by learning new things on the internet...2019 was very harsh and hard as compared to the pandemic.” (P11, Female)

Moreover, the participants shared apprehensions about social media. It included the negative effects of comparing their lives with others and promoting a perception of an idealized life. The participants also pointed out that inauthentic experts and the disseminating of misleading information on social media platforms contribute to the complexities of seeking accurate mental health resources online. As explained by a participant —

“there is a lot of misinformation and everybody these days has become a counselor or a psychologist. There are people who are making wrong claims and giving false information. I know a lot of people who do not even have medical background talk about being professionals and

surprisingly these people have become influencers and are talking about whatever fits their narrative. And it's sad for people who don't really know anything and they buy that information.”
(P10, Female)

Participants' perspectives: Towards Technology-Enabled Support

We observed that participants acknowledged technology's positive role as a facilitator and catalyst for bringing about positive change and complementing the existing human infrastructure in mental health support. They highlighted the role of education and awareness through technology, suggesting displaying stories or inspirational content to raise awareness and promote mental health understanding among students at the college and university levels. As suggested by a participant —

“... schools and colleges now let other people come and give talks and any kind of awareness like we have drug abuse as an issue today... believe me, these university students are going through a hell of stress presently because of competition, unemployment... I think that is one of the platforms where you can introduce technology show them the impact of mental health or display inspirational stories...”(P5, Female)

Participants suggested leveraging social media platforms as an effective means to disseminate mental health information and combat the lack of awareness of mental health issues. While recognizing social media's potential for addressing mental health awareness due to its wide reach, they emphasized involving trusted professionals to disseminate valuable information and promote better community understanding. As suggested by a participant —

“the people who have the platform who have the voice, they can talk about it. similarly, people who are following them, see or listen to that, they might feel that no, it's not a problem with me. Other people are also facing the same issue..that's what I believe could be done...talking about it, on platforms and social media.” (P16, Female)

Participants also recommended a push towards increasing the popularity of online counseling and making counselors and therapists more visible and recognizable through digital platforms while ensuring the privacy and security of patients. They emphasized the importance of prioritizing privacy and security in online

counseling to address concerns about information sharing. They believe that ensuring a sense of confidentiality would be particularly beneficial for individuals who hesitate to seek professional help in traditional clinic settings due to the stigma and taboo around mental health. A participant suggested —

“there are a few apps like ACE online or Made Easy, if you purchase their prerecorded courses, and if you wish to screenshot or screen record the content, the app doesn’t allow that. Similarly, if online therapy or sessions have the same features, a person can ensure that the session can neither get recorded nor allow taking screenshots. That way, patients will get privacy, and they won’t hesitate to talk about everything...” (P11, Female)

7.6 Discussion

We adopt Ecological Systems Theory (EST) [43] to examine our findings, aligning with the calls in HCI and healthcare calls for ecological mental health approaches. Our analysis delves into diverse influences on individuals’ support-seeking journeys, crucial for understanding our context and uncovering factors contributing to successful sustainable mental health support design. Recognizing evolving needs amid contextual uncertainty, our study presents the multi-layered influences shaping professional help-seeking, aiding intervention design. We also identify the complexities and the interconnections between different systems helpful for designing effective interventions and considerations to improve mental health support seeking in the region. Through this, we discuss the non-linear nature of the ecological approach, influenced by socio-political and socio-cultural factors in our context. This application of EST is particularly crucial for rendering the model resonant with the local lived experience, foregrounding how the on ground realities shape each layer of mental health support. We direct our efforts toward how researchers, practitioners, and the HCI community can address and account for diverse challenges posed by our complex research context, offering socio-technical design recommendations for improving mental health support.

7.6.1 The interplay of Influences: Ecological Model of Mental Health Support Seeking

The individual seeking professional support is at the center of our model with the individual’s attributes, e.g., age, gender, common mental health condition type, and other demographics. Surrounding the individual are interconnected “layers” of relations, which reflect the individual’s nature of interaction within those varied compositions of influences in the ecology of an individual’s mental health support-seeking journey.

The following sections provide a detailed description of the model depicted in 7.1. We discuss how the interactions of the individual allied with the influence from the outer layers make this a challenging context for the individual at the center of this ecology.

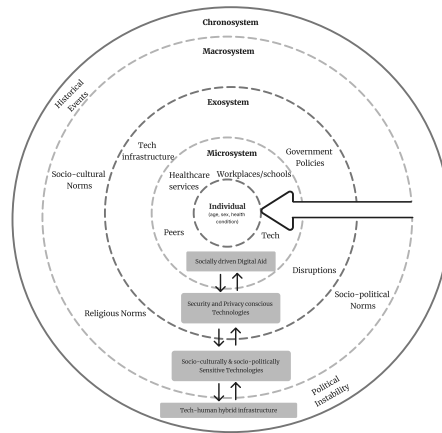


Figure 7.1: Social Ecological Model for Mental Health Support Seeking in our Context. The darker boxes highlight our recommended consideration at each layer.

Chronosystem Level Influences — Our findings reveal the dominant influence of the chronosystem, spanning decades (e.g., ongoing socio-political context), shaping individuals’ behavior and mental health access. This influence permeates across ecological levels, directly impacting individuals and complicating support-seeking. Factors like prolonged political unrest, lockdowns, and internet disruptions profoundly limit access to mental health services in the region [66]. We noticed the chronosystem influences are deeply embedded over time, posing complex challenges for individuals within the system. This system’s unique characteristics and external factors compound complexities, requiring support-seeking individuals to navigate through disturbances and burdens across layers. Research in HCI and mental health interventions emphasizes the need for an ecological approach, incorporating social and environmental in mental health interventions [75, 365, 325]. Pendse et al. emphasize cultural, linguistic, and socio-economic considerations [275], while Tachtler et al. highlight considering political and legal factors among unaccompanied migrant youth [347] towards taking a social-ecological approach to mental health. However, much research has focused on the effectiveness of specific technological tools for mental health support, such as mobile apps or social media. These studies often overlook how a mix of these technologies can be utilized in a complicated socio-political

landscape. Considering the challenges arising from historical events in our context, it is crucial to design technology-mediated solutions that coexist to function during technological breakdowns or periods of inaccessibility.

Implications for Chronosystem — Socio-political influences play a crucial role in the effectiveness of mental health interventions, especially in areas like Kashmir, where disturbances can worsen an already significant mental health crisis. These influences directly impact the accessibility of offline and online resources. Mental health solutions, even when grounded in HCI principles, can become ineffective or harmful if they fail to account for the unpredictable breakdowns or disruptions in such settings, as highlighted by the literature [340]. Unique challenges like the internet shutdown, e.g., the year-long shutdown after the abrogation of Article 370⁵, which coincided with the COVID-19 pandemic [193], necessitate resilient and adaptive mental health solutions. This must entail an *integrated* pathways requiring solutions to coexist, combining both tech-mediated interventions and the human and community infrastructure. We propose a *tech-human hybrid* approach, where human resilience bridges gaps during connectivity disruptions, and technology is leveraged upon restoration. It is vital to realize that while normalcy does offer infrastructure support for tech solutions, the unpredictability demands an adaptive balance of both approaches to ensure continuous mental health support and prevent potential re-traumatization.

We propose a two-pronged design approach that leverages human community infrastructure [303] and tech-mediated solutions for crisis support. Emphasizing the need for contextual sensitivity, local community centers and local support groups should be established and equipped with basic mental health training, creating fallback networks for times of crisis. The need for having multiple adaptive solutions is also amplified by the Luk et al. [228], and Densmore et al's. [79], work in Uganda and Ghana for healthcare. We saw in our context that individuals feel a reduced connection with therapists from different regions due to their lack of understanding of local challenges. Therapists from within the community inherently grasp these unique contexts, providing tailored counseling. Within our framework, the *human* factor concept takes on a distinct meaning – embodying not only empathy but also a comprehension of contextual histories to ensure effective and meaningful patient support. Cultural elements, emphasized by several works in the field [275], can be integrated by strengthening the existing assets within the region, e.g., using discreet technologies like local communication channels like community radio [188], use of IVR [136, 406]. A hybrid telehealth and

⁵https://en.wikipedia.org/wiki/Article_370_of_the_Constitution_of_India

in-person model [29] is suitable for contexts like Kashmir but engaging with the local community through participatory co-design is essential to understand specific needs and enhance its effectiveness. Government organizations can extend the ecosystem of care by mobilizing resources and support for mental health by integrating mental health interventions through partnerships with local NGOs on the ground as *intermediaries*, a concept supported by extensive research [389, 186, 18]. We recommend a tech hybrid system designed for adaptability with an emphasis on offline functionality as a default and constant option. Tech platforms should support offline data synchronization and switch to offline modes like SMS during internet outages. Such adaptable solutions in healthcare (e.g.,[243, 242, 353]), can enhance the resilience and adaptability of mental health support systems in socio-politically complex environments.

Macrosystem Level Influences — Our research identified two main factors from the macrosystem that affect individual support-seeking behaviors for mental health: socio-cultural context and socio-political conditions. These greatly influence one’s perception and communication of mental health symptoms. Mental health topics often face stigma, reducing open discussions extensively discussed in the existing scholarship. Notably, gender and religious norms play a significant role in influencing support-seeking behaviors, especially among women. We saw that cultural and religious values often discourage females from seeking help and affect their choice in therapists. Political dynamics also impact the availability and prioritization of mental health care. For instance, due to political tensions, mental health has become a lower priority. Kashmiri identities further face risks, isolation, and suspicion, complicating their support-seeking. Further, individuals, exposure to violence and traumatic experiences add to challenges, highlighting the intertwined influence of socio-cultural and political factors on mental health practices in our study context.

Implications for Macrosystem — Drawing upon the salient challenges demonstrated in our findings, the macrosystem—encompassing socio-cultural and socio-political elements—significantly impacts how individuals seek and utilize mental health support. To address these challenges, we offer recommendations for tech-mediated interventions that can provide mental health support in a way that is sensitive to cultural and socio-political influences. One potential way is to draw from Value Sensitive design [118, 119] framework used in HCI literature to direct engagement with vulnerable populations. It emphasizes on integrating human values into technology by considering ethical, social, and cultural aspects throughout the design process. For example, create anonymous mental health platforms where users can seek advice without fear

of judgment. This could be done by developing localized content that reflects users' cultural norms and religious beliefs. Designs should also feature gender-sensitive interfaces that offer the option for users to speak to same-gender therapists, making the experience more relatable for users [118, 119]. In addition, mobile applications can be leveraged to improve symptom recognition, which is often trivialized or ignored due to prevailing socio-cultural attitudes, as corroborated by prior works [359, 52]. These applications could integrate emergency features to address immediate needs, especially with specialized care modules incorporating trauma-informed design paradigms [151, 309, 56] that provide specialized care for individuals exposed to violence or traumatic experiences. These should be highly accessible and prominently displayed in user interfaces. On the policy and governance front, data-driven policy advocacy tools can also be made to improve mental health support. For example, data-driven policymaking can be used to show policymakers the scale of mental health issues in different cultural and political contexts. This information can then be used to allocate resources more effectively. Political advocacy tools can also be created to make it easier to advocate for mental health services as a political priority. In line with Pendse et al.'s [275] suggestions, all these solutions should offer multi-language support for varied languages and regional dialects, ensuring accessibility to a diverse user base. Incorporating these nuances into the design systems would be one positive step towards an integrated, responsive digital ecosystem to help mitigate some of the challenges individuals face in seeking mental health support due to socio-cultural and socio-political influences.

Exosystem Level Influences — The exosystem includes formal or informal systems that indirectly influence individuals. Our findings highlight various such systems like the technical infrastructure, healthcare infrastructure, government policies, and disruptions. Firstly, the technical infrastructure in Kashmir has been unstable and uncertain. However, when available, the technical infrastructure can empower individuals to recognize and address their disorders, as demonstrated in our findings. This is further detailed in microsystems. Secondly, we found that regional healthcare infrastructure is vital for healing individuals and promoting health awareness. The healthcare infrastructure of Kashmir remains weak with minimal to no support present to aid mental health patients as explained in the following section. Thirdly, various government policies like helplines have also been placed to support the mental health of citizens. However, despite the value of helplines to individuals to seek help by phone, concerns around privacy and lack of contextualization of helplines made individuals hesitate to use these services. Lastly, as detailed above, disruptions caused by the crisis influence the mental health of individuals. Accounts of witnessing violence firsthand

and experiencing the loss of loved ones and peers owing to the unrest have left many with deep-seated traumatic memories resulting in disorders and distress.

Implications for Exosystem — Prior literature has explored the increasing risks of privacy violation and unintended breaches of confidentiality owing to the shifted focus on digital mental health[**<empty citation>**]. There is a need to take fears and concerns of users into account when designing helplines and openly accessible resources. Helplines need to transparently communicate and inform the user that their data will remain confidential through special disclaimers and explanations [280]. More so, users can be given agency to control the exposure of their identities through features like voice-changing options. More so, for users from Kashmir, it remains essential to connect them to Kashmiri therapists and help providers to ensure and comfort users while providing contextually accurate and sufficient care to them. The popularisation of SMS-enabled helplines can also be useful during the unavailability of the internet.

Microsystem Level Influences — Our findings reveal that the microsystem comprises the following: family and peers, healthcare providers, technology, workplace, and education. Among *families and peers*, disruptions foster fear and uncertainty and shape their dynamics. Our study found that concerns about employment and providing for one's family amidst uncertainty led to mental distress. However, individuals often avoided seeking support from family and peers or kept their mental health a secret due to stigma, fear of judgment, and limited awareness about mental health. Our findings also bring the poor state of mental *healthcare providers* in Kashmir to light. Insufficiently trained professionals, lack of seriousness towards patients, and improper physical infrastructure like clinics significantly hinder and damage help-seeking and recovery. This ecosystem also interacts with families and peers. Families sometimes suggested faith healers over professionals or judged patients for seeking help. *Technology* as a system seems to have a very critical influence on an individual as it came up as an instrument of awareness, support, and inspiration. Mental health information sharing through Social Media and YouTube encourages help-seeking. Individuals also use online video conferencing for therapy and seek inspiration from mental health patient stories. Yet, the uncertain technology availability due to the unrest triggers feelings of isolation for many individuals. Harmful social media content, spreading misinformation and hate, also has adverse effects on mental health. *Workplaces* offer mental health support through initiatives like well-being cells, but concerns about degrading reputation on the reveal of poor mental health hinder open disclosure and sharing. *Educational institutes* also lack the

needed information and education about mental health.

Implications for Microsystem — Even though technology access in Kashmir remains unstable and unpredictable, our findings highlight the potential for context-sensitive digital mental health for the times when the internet is accessible. To maximize the positive impact of technology on seeking help, we propose building upon existing assets like tech-dependent mental health practices [399]. We realize the need to facilitate open discussions around mental health to destigmatize it and raise awareness. Public movements and campaigns can be a medium to achieve the same as was also highlighted in our findings. Public mental health campaigns, similar to cancer awareness initiatives [402], can educate communities about mental health symptoms, precautions, and treatment, while influential figures can also promote its importance. Social media, contextualized applications, and websites, influential videos, SMS and call outreach, discussion forums, radio services, online crowdfunding, and virtual meetings can be leveraged to carry out such campaigns and movements as has also been observed in prior literature [82, 194, 297]. Educational institutions can establish wellbeing cells to educate students about mental health through interactive sessions and introduce beneficial technical resources. These well-being cells can also be online groups or platforms provided by workspaces to engage in discussions on mental health and connect to peers going through similar experiences as suggested by O’Leary et al. [271]. Such special spaces and support groups encourage conversations around stigmatized topics and provide a forum for individuals with shared experiences to offer each other support, as recommended by Tuli et al., [364]. These platforms can be made engaging to attract active usage by making them empathetic and interactive through gamification and personalization [200, 9, 360, 239, 137]. Online sessions conducted by professionals can also be introduced to increase awareness in schools and workplaces. More so, customized apps can facilitate anonymous help-seeking and shared experiences in workplaces and schools, enabling individuals to connect with peers anonymously, fostering support without the fear of judgment [108, 391]. Prior work has also suggested various technological solutions to address the lack of accessible professional help which include online therapy [385], empathetic chatbots [236], healing apps [70], mental health trackers [204], etc. However, it was shown in our study that Kashmiris prefer talking to therapists of their origin since they can understand their sensitive contexts better. Participatory design sessions [2] along with the affected population in Kashmir can help inform the design of such mental health applications in ways that cater to their specific needs and requirements owing to their non-normative context. Jo et al. explored LLM-powered chatbots as therapists [175], which presents

opportunities for regions like Kashmir. These chatbots can be enhanced with Kashmir-specific context and language proficiency. Therapists, whether local or external, can also be sensitized to the Kashmiri context and connected to individuals through online platforms. However, it is also essential to control the potential harm technology might exert on users from sensitive contexts like that of Kashmir. Strict checks on fake information and hateful content around mental health should be enabled to avoid exposure of individuals coming from special contexts to misleading and adverse content [362]. Scores or markers can be provided to fact-check posts that advocate facts about mental health issues. More so, the existing development in the LLMs space can be explored to incorporate in-built-fact checks and explanations on social networking platforms so the users can get quick information about the validity of online information.

Closing Reflections: The findings illustrate how young people negotiate institutional absences by creating and sustaining grassroots infrastructures of emotional support. Through practices of sharing, listening, and online anonymity, they carve out meaningful forms of care in constrained conditions. These insights directly contribute to RQ1 by showing where mental health infrastructures fail, to RQ2 by revealing how young people respond to those failures, and to RQ3 by informing design pathways that are attuned to socio-political sensitivities and trust-based engagement. While this chapter examined how individuals navigate mental health support amid infrastructural complexity, the next chapter draws together insights from across the case studies presented in this thesis to articulate broader contributions to HCI in protracted crisis settings.

Chapter 8

Contributions and Conclusion

CHAPTER 8

CONTRIBUTIONS AND CONCLUSION

In this thesis, we present a landscape of the role of Information and Communication Technologies (ICTs) through five case studies spanning various human development domains, including education, economic advancement, and mental health well-being, where the interplay between technology, socio-political dynamics, policy, practices, and beliefs shapes outcomes. Through these case studies, we identify key opportunities for Human-Computer Interaction (HCI) to foster resilience and adaptability in conflict-affected regions. Each study has contributed to the broader discourse in HCI, spanning crisis informatics, education, development, the future of work, and mental health and well-being, by centering the lived experiences of individuals in conflict-affected regions. We offer empirical insights into how disruptions impact interactions with technology and access to its usage. Additionally, we provide recommendations for technology design and policy interventions that could address these challenges. Our research contributes to the literature by highlighting the additional challenges faced by individuals across different domains in such regions. Specifically, we explore how the disruption of one aspect of human development—such as education or economic opportunity—can have cascading effects on others, ultimately influencing overall mental health and well-being. We also emphasize the systemic and infrastructural challenges people encounter, with a particular focus on how community-based initiatives, such as the role of NGOs and local workarounds, serve as critical infrastructure. These local adaptations play a crucial role in sustaining activities and facilitating access to resources, thereby enabling resilient infrastructuring. Moreover, we offer insights into the adaptive strategies and resilient mechanisms employed by individuals in these contexts, underscoring how they navigate socio-political constraints. We explore how these constraints shape technology adoption and adaptation, and we emphasize the importance of contextually aware technology design that accounts for the socio-political realities and infrastructural limitations of conflict-affected areas.

In the domain of education in Chapter 3, the research uncovered how Community Learning Centers have become essential infrastructures for maintaining continuity in learning. These centers serve as vital spaces where education is restructured in response to recurring disruptions. The study highlighted the importance of designing for uncertainty and infrastructuring trust, as students, teachers, and families collectively devise

strategies to cope with frequent interruptions in formal schooling.

Regarding employment in Chapter 4, the study examined the role of digital platforms in providing work opportunities amid mobility restrictions and socio-political uncertainties. While these platforms offer some degree of financial stability, they remain inadequate in fully addressing the challenges posed by conflict conditions. The findings underscored the need for decentralized employment infrastructures that are resilient to disruptions and tailored to the region's specific needs.

The research in Chapter 5 also investigated skill-based entrepreneurship, focusing on how women entrepreneurs leverage training programs to gain economic agency. While these programs serve as critical enablers, their impact remains constrained by socio-cultural expectations, limited digital literacy, and infrastructural gaps. The study emphasized the necessity of creating more inclusive and context-aware training programs that acknowledge and address these limitations.

Social media-based entrepreneurship emerged as another key area of exploration in Chapter 6. The study revealed that social media platforms provide an alternative avenue for women to engage in economic activities, allowing them to circumvent traditional employment barriers. However, this opportunity comes with significant risks, including online harassment, algorithmic visibility issues, and inadequate platform support. The findings suggest that while social media can be an empowering tool, it also necessitates stronger safeguards and policy interventions to ensure a safer and more equitable digital environment for women entrepreneurs.

Finally, chapter 7 delved into mental health and well-being, examining the role of digital interventions in facilitating access to mental health resources. While digital platforms offer new pathways for seeking support, the research highlighted the deep influence of localized socio-cultural factors on help-seeking behaviors. The study calls for more context-sensitive approaches in designing digital mental health tools that are attuned to the specific needs and constraints of conflict-affected communities.

8.0.1 Overarching Contributions and Key Insights

This dissertation's collective work provides several overarching contributions that extend beyond the specific findings of individual case studies, offering key theoretical and conceptual insights to HCI. Firstly, by empirically detailing the lived experiences across education, employment, entrepreneurship, and mental health, the thesis presents a holistic understanding of vulnerability and need in protracted crisis. It highlights the cascading effects of infrastructural fragilities, socio-economic pressures, and sustained uncertainty, thereby

enriching HCI's discourse on conflict-affected communities and the pervasive impacts of disruptions.

Secondly, this work significantly advances HCI's understanding of resilience as a complex, actively constructed phenomenon. It demonstrates how individuals and communities in adversity forge human and technical resilience through adaptive practices and resourceful engagement with technology. Concepts such as 'routine infrastructuring' are deepened by empirical evidence of how local workarounds and community-led initiatives serve as critical, flexible infrastructures for sustained activity amidst systemic breakdowns. This highlights the vital interplay between human ingenuity and adaptable technological engagement in maintaining continuity and well-being in non-normative circumstances.

Thirdly, the thesis proposes and substantiates contextually-sensitive socio-technical design paradigms. Through the synthesis of findings, we introduce and develop:

- ***'Design within Uncertainty'***: An approach emphasizing the need to engineer solutions that inherently account for unpredictable infrastructural failures and chronic instability, rather than assuming normative conditions.
- ***'Infrastructuring Trust'***: Highlighting the imperative for building digital solutions that align deeply with local socio-cultural values and actively integrate trusted human intermediaries to foster adoption, mitigate mistrust, and address privacy and safety concerns within sensitive contexts.
- ***'Integrating Gendered and Decolonial Perspectives'***: A core insight underscoring that effective design must address systemic inequities, particularly those faced by women in technology access and use in patriarchal settings, and actively challenge universalizing technological assumptions by prioritizing localized realities and power dynamics.

Finally, this dissertation enriches HCI's overall understanding by presenting a 'non-normative' account of HCI. It brings to the forefront experiences from a marginalized community often overlooked in mainstream discourse, foregrounding critical design challenges and adaptive strategies. This perspective broadens the scope of HCI, advocating for deeper engagement with diverse, complex realities to inform the development of responsive, equitable, and sustainable socio-technical systems globally.

8.0.2 Research Gaps and Challenges

While this dissertation makes significant contributions, it also identifies several gaps that warrant further exploration. One of the most pressing gaps is the limited digital infrastructure available to communities

in politically unstable regions. The research found that individuals often rely on community-driven infrastructures and informal networks due to the absence of robust, state-supported digital services. The lack of reliable connectivity, frequent internet shutdowns, and limited access to devices further exacerbate digital exclusion in these regions.

Another major challenge is the limitations of existing digital platforms. Many platforms are designed with assumptions of stability and accessibility, making them ill-suited for users in conflict-affected areas. These platforms do not account for the fluid and uncertain conditions that define everyday life in politically disrupted environments. As a result, users often develop their own improvised strategies to work around these constraints, highlighting the need for platforms that are more adaptive and responsive to such realities.

Furthermore, the dissertation identified the intersectional constraints that shape digital adoption and access. Socio-political, cultural, and gendered factors intersect in complex ways, influencing how individuals engage with digital technologies. Women, in particular, face unique barriers, from online harassment to limited mobility, which affect their ability to fully participate in the digital economy. Addressing these challenges requires a nuanced, intersectional approach to ICT design and policy-making.

8.1 Future Research Directions

Based on the findings and contributions of this dissertation, the following broad directions for future work emerge. These directions are rooted in the insights gained from the in-depth studies conducted across education, employment, entrepreneurship, and mental health in protracted conflict zones, particularly in Kashmir. By engaging deeply with the systemic challenges identified in the preceding chapters, these directions aim to address the socio-technical gaps and create sustainable pathways for resilience and growth.

8.1.1 Designing Resilient Digital Infrastructures

Given that disruptions in conflict-affected regions are not isolated events but persistent conditions, future research should explore how digital infrastructures can be made more resilient. The systemic disruptions caused by protracted socio-political conflict, as outlined in Chapters 3 and 4, underscore the urgent need for resilient digital infrastructures. The findings highlight the cascading effects of infrastructural fragility, including frequent internet shutdowns, restricted mobility, and the resulting isolation from critical resources like education and employment. Future research should prioritize the design of adaptive technologies capa-

ble of operating effectively in such volatile conditions. For instance, offline-first applications, decentralized storage mechanisms, and peer-to-peer networks can mitigate the impact of connectivity disruptions. Additionally, resilience in digital infrastructure requires engaging with local stakeholders, including community members, NGOs, and policymakers, to co-create solutions that align with the unique socio-political context. For example, collaborative efforts could focus on developing community-driven education platforms that allow asynchronous learning during periods of disruption. Similarly, employment-support tools could integrate features that account for the mobility constraints faced by individuals in conflict zones. Such initiatives could pave the way for inclusive and sustainable socio-technical systems that empower communities to navigate uncertainty.

8.1.2 Empowering Women Through Contextually Sensitive Digital Platforms

Many existing digital solutions fail to account for the socio-cultural specificities of conflict zones, often imposing external models that do not align with local realities. Chapters 5 and 6 reveal the unique challenges faced by women entrepreneurs in conflict zones like Kashmir, including societal norms, privacy concerns, and limited access to skill-building opportunities. These barriers are further exacerbated by the gendered impacts of conflict, which constrain women's participation in public and economic spheres. Future research should focus on designing digital platforms that cater specifically to the needs of women entrepreneurs, providing them with safe spaces to learn, connect, and grow their businesses. Key features of such platforms could include advanced privacy controls to protect users from online harassment, culturally sensitive content tailored to local norms, and mechanisms to foster peer-support networks. For example, platforms could enable women to share their entrepreneurial journeys, exchange resources, and build community solidarity. Hybrid skill-building initiatives that blend online and offline training programs can also play a pivotal role in bridging the digital divide and ensuring accessibility for women with limited technological literacy. Moreover, future work should explore policy interventions and partnerships with local organizations to address systemic barriers to women's entrepreneurship. This includes advocating for financial support programs, mentorship opportunities, and market access strategies that are contextually informed and inclusive. By centering the experiences and aspirations of women entrepreneurs, these efforts can contribute to creating equitable economic opportunities in conflict-affected regions.

8.1.3 Integrating Gendered Perspectives into Technology Design

Gendered barriers and systemic inequities emerged as significant challenges in the findings of this dissertation, particularly in the context of social media entrepreneurship and skill-based training. Future research should focus on integrating gender-sensitive frameworks into the design, implementation, and evaluation of technology. This involves recognizing and addressing the unique barriers faced by women in accessing and using technology, such as socio-cultural norms, safety concerns, and limited digital literacy. One promising direction is the development of technologies that specifically support women's economic participation and empowerment. For example, platforms designed for women entrepreneurs could include features that enhance privacy and safety, provide access to mentorship and training, and offer tools for navigating socio-cultural challenges. Additionally, research should investigate how digital platforms can foster community support networks among women, enabling them to share resources, build solidarity, and collectively address challenges. The findings of this dissertation highlight the potential for technology to act as both a tool for empowerment and a mechanism for reinforcing existing inequities. By integrating gendered perspectives, future research can ensure that technological interventions do not inadvertently perpetuate these inequities but instead contribute to more inclusive and equitable outcomes. This includes engaging with feminist frameworks and methodologies to critically examine how technology intersects with issues of gender, power, and access.

8.1.4 Leveraging AI and Data-Driven Technologies

Mental health, as explored in Chapters 7, remains a critical yet under-explored area in conflict settings like Kashmir. The findings highlight the psychological toll of prolonged uncertainty and the lack of accessible mental health resources. Future research should investigate how AI and data-driven technologies can be harnessed to address these gaps while ensuring ethical considerations and cultural sensitivity. For example, conversational agents and mental health tracking tools can provide personalized support to individuals experiencing distress. These technologies should be designed through participatory approaches, involving community members and mental health professionals to ensure they align with local values and practices. Additionally, integrating these tools into broader healthcare systems can enhance their scalability and effectiveness, particularly in resource-constrained settings. Efforts should also focus on addressing privacy concerns and ensuring that mental health data is handled securely and transparently. This includes developing

robust data governance frameworks and fostering community trust in technology-mediated care. By leveraging AI and data-driven solutions, future research can contribute to building accessible and contextually relevant mental health support systems that address the unique challenges of conflict-affected communities.

8.2 Concluding Remarks

The directions outlined above are grounded in the empirical and theoretical contributions of this dissertation. The findings underscore the urgency of moving beyond one-size-fits-all digital interventions and instead embracing approaches that recognize the precarity and resilience that characterize life in conflict-affected regions. This dissertation distinctly contributes by articulating the acute specificity of a context like Kashmir, where the confluence of decades of protracted conflict, unpredictable state-imposed communication blackouts, and deeply entrenched socio-cultural norms creates unique and compounded challenges. It emphasizes that while some issues may resonate globally, their intensity and specific manifestations here necessitate context-attuned research and design. Thus, by foregrounding the lived experiences of users, this research contributes to a more nuanced understanding of technology's role in shaping resilience and adaptation in politically unstable contexts. Reflecting the urgent need for research that prioritizes resilience, inclusivity, and equity in the design of socio-technical systems for marginalized contexts.

As digital technologies continue to evolve, future research must remain attuned to the complexities of socio-political realities, ensuring that ICT interventions are not only technologically efficient but also socially and ethically responsive. By addressing these directions, future research can contribute to the development of technologies that not only respond to immediate needs but also foster long-term sustainability and empowerment for communities facing systemic challenges. The hope is that through continued engagement with affected communities, HCI scholars and practitioners can contribute to the development of more just, inclusive, and sustainable digital futures.

APPENDIX A
THESIS PUBLICATIONS

- **Asra Sakeen Wani**, Divyanshu Kumar Singh, and Pushpendra Singh. “People take you for a person pursuing a hobby”: Women’s Experiences with Online Entrepreneurship. In Proceedings of the 2025 International Conference on Information Technology for Social Good (GoodIT’25). [Under-submission]
- **Asra Sakeen Wani** and Pushpendra Singh. Understanding the Role of Community Training Centers on Skill-Based Entrepreneurial Training Among Women in Kashmir. In Companion Proceedings of the 2025 ACM International Conference on Supporting Group Work, 2025.
- **Asra Sakeen Wani**, Ishika Joshi, and Pushpendra Singh. 2024. Navigating the Job-Seeking Journey: Challenges and Opportunities for Digital Employment Support in Kashmir. In Proceedings of the ACM on Human-Computer Interaction, Vol. 8, CSCW1, Article 98 (April 2024).
- **Asra Sakeen Wani**. 2024. Use of ICTs during ongoing protracted socio-political disruptions. Extended Abstracts of the CHI Conference on Human Factors in Computing Systems. May 11–16, 2024. Honolulu, HI, USA.
- **Asra Sakeen Wani**, Ishika Joshi, Pushpendra Singh. 2024. “*Unrest and trauma stays with you!*”: Navigating mental health and professional service-seeking in Kashmir. ACM Conference on Human Factors in Computing Systems. May 11–16, 2024. Honolulu, HI, USA.
- **Asra Sakeen Wani**, Divyanshu Kumar Singh, Pushpendra Singh. 2022. “*Hartal (Strike) Happens Here Everyday*”: Understanding Impact of Disruption on Education in Kashmir. ACM Conference on Human Factors in Computing Systems (CHI 2022).

APPENDIX B
OTHER PUBLICATIONS

- Vishal Sharma, **Asra Sakeen Wani**, Christoph Becker, Douglas Schuler, Raphaël Marée, Anupriya Tuli, Rikke Hagensby Jensen, Han Qiao, Aparajita Marathe, and Neha Kumar. An Emerging Case of Post-growth in HCI. XRDS: Crossroads, The ACM Magazine for Students. 2025.
- Jasmeet Kaur, **Asra Sakeen Wani**, and Pushpendra Singh. "Engagement of pregnant women and mothers over WhatsApp: Challenges and opportunities involved." In Companion Publication of the 2019 Conference on Computer Supported Cooperative Work and Social Computing (CSCW), pp. 236-240. 2019.
- Anupriya Tuli, Kamala Payyapilly Thiruvankatanathan, Benedetta Lusi, Adrian Petterson, Alejandra Gomez Ortega, Karthik S. Bhat, Sachin R. Pendse, **Asra Sakeen Wani**, Laia Turmo Vidal, Azra Ismail, Joo Young Park, Dilisha Patel. 2025. Behind the Scenes: A SIG on Researcher Care and the Invisible Care Work. In Companion Publication of the 2025 Conference on Computer-Supported Cooperative Work and Social Computing (CSCW Companion '25). Association for Computing Machinery, New York, NY, USA.
- Sachin R. Pendse, Novia Wong, Munmun De Choudhury, Jaydon Faraó, Neha Kumar, Nasalifya Namwinga, Giovanni Ramos, **Asra Sakeen Wani**, Jessica Schleider, Madhu Reddy. "Beyond Culture: Centering Power, Reciprocity, and Justice in the Design of Digital Mental Health Tools." In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems. 2025.
- Vishal Sharma, Hongjin Lin, **Asra Sakeen Wani**, Jared Katzman, Anupriya Tuli, Naveena Karusala, Shaowen Bardzell, Christoph Becker, Martin Tomitsch, Neha Kumar. "Advancing Post-growth HCI." In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems. 2025.
- Vishal Sharma, Anupriya Tuli, **Asra Sakeen Wani**, Anjali Karol Mohan, Bonnie Nardi, Marc Hassenzahl, Morgan Vigil-Hayes, Rikke Hagensby Jensen, Shaowen Bardzell, and Neha Kumar. "Post-growth HCI: Co-Envisioning HCI Beyond Economic Growth." In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems, pp. 1-7. 2024.

- Vishal Sharma, Christianah Titilope Oyewale, Eldy S. Lazaro Vasquez, **Asra Sakeen Wani**, Eunice Sari, Joycelyn Longdon, Laura Cabrera-Quiros, and Pushendra Singh. "Sustainabilities and HCIs from the Souths." In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems, pp. 1-5. 2024.
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