UNDERSTANDING TECHNOLOGY-INTEGRATED WORK THROUGH THE HRD-CARE MODEL: EVIDENCE FROM A MULTIGENERATIONAL CAREGIVER QUALITATIVE STUDY

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ABSTRACT

Digital technologies are now central to how learning facilitators coordinate work, sustain participation, and demonstrate reliability in technology-integrated environments. For those with multigenerational caregiving responsibilities, technology simultaneously enables continuity and intensifies coordination demands. Guided by the HRD-CARE model—which conceptualizes caregiving through care-role complexity, temporal–emotional load, and the employment interface—this qualitative study examines how learning facilitators use digital tools to sustain full-time employment while navigating competing caregiving obligations. Findings show that technology functions as continuity infrastructure, supports boundary work through digital coordination, and contributes to developmental trade-offs when time and energy are constrained. Although technology expands feasible participation, it does not eliminate role collision and may increase the visibility of caregiving-driven variability at key developmental gateways. The study advances HRD scholarship by demonstrating how caregiving conditions shape participation, development, and access to opportunities in technology-integrated work.

KEYWORDS

Learning facilitator, technology integration, sandwich generation, care giving, human resource development

1. INTRODUCTION

Information and communication technology is no longer peripheral to knowledge work; it is the infrastructure through which work is coordinated, monitored, and completed [1,2,3]. Digital tools are now embedded in how employees communicate, schedule, document progress, and sustain continuity across tasks—often across work and non-work roles [4]. This technological shift is especially visible in learning-centered occupations where work is interactional, time-bound, and sequence-dependent. For learning facilitators, instructional preparation, delivery, learner support, and stakeholder coordination increasingly occur through technology-mediated platforms [3].

Yet technology-integrated work changes more than *how* work is done. It changes what "participation" looks like. When meetings are virtual, responses are timestamped, and collaboration occurs through persistent channels, reliability can come to be equated with rapid responsiveness and visible presence[5]. In other words, technology can expand access and flexibility, but it can also intensify how job devotion is signaled and interpreted—sometimes beyond formal work hours [6]. What counts as being "present" when work is conducted through screens, messages, and calendars? And who is most likely to be penalized when technology makes variability more observable?

These conditions are situated within a broader reconfiguration of work and employment. Kossek and Perrigino[7] describe contemporary work as increasingly boundaryless, with heightened expectations of availability, intensified work–life demands tied to shifting family composition, and 24/7 coordination pressures in a global economy. These shifts matter for learning facilitators because facilitation depends on dependable follow-through: instruction has start times, learners expect continuity, and stakeholders notice breakdowns quickly. The same technology that enables facilitation across distance can also compress response cycles and raise the social and professional stakes of missed cadence.

At the same time, individuals do not enact a single role in isolation. Multiple roles are a routine feature of contemporary life, and they are rarely as neatly bounded as organizations presume [8,9]. For many workers, the same devices that support teaching, training, and coordination also transmit family demands—texts from relatives, medical updates, school notifications, and caregiving requests. Technology becomes the shared conduit through which competing role expectations circulate. As a result, work–care coordination is less a matter of attitude or "balance" and more a matter of ongoing, real-time negotiation across overlapping obligations.

Powell et al. [10]conclude that the changing structure of work is compounded by parallel shifts in the structure of families and the logic of careers. As family arrangements diversify and caregiving intensifies, workers increasingly sustain career participation while managing role obligations that cannot be deferred to "after work" [11]. The consequences are not evenly distributed. Care responsibilities are shaped by gender, age, life stage, household structure, income, and the availability of care network support, thereby determining who bears greaterconstraints and who is more likely to be evaluated against "ideal worker" assumptions [12,5]. In technology-integrated environments—where responsiveness, attendance, and follow-through are highly visible—these patterned constraints can translate into differential access to opportunities and heightened vulnerability to marginalization.

Despite extensive scholarship on technology-enabled work and on work–family dynamics, little empirical research has centered on learning facilitators who are also multigenerational caregivers, and asked a simple question: How do they actually keep work going when care demands collide with technology-integrated participation expectations? This study addresses that gap by examining how learning facilitators with multigenerational caregiving responsibilities use digital technologies to sustain full-time employment in technology-integrated work environments. The sections that follow situate multigenerational caregiving as an increasingly common midlife role configuration (Background) and introduce the HRD-CARE model as an analytic framework for interpreting how caregiving conditions shape participation and developmental continuity over time (Theoretical Underpinnings).

2. BACKGROUND

Multigenerational caregiving refers to a role configuration in which an adult participates in paid work while providing ongoing care to at least two generations of kin—most commonly children and aging parents or relatives[13]. Often labeled the "sandwich generation," these arrangements have become increasingly routine in midlife as longer life expectancy, changing family size, and evolving household structures converge with continued labor force participation [14,15]. As a result, many workers maintain full-time employment while managing time-sensitive and relationally intensive caregiving obligations that require coordination, vigilance, and rapid role-shifting throughout the day.

Recent estimates indicate that a substantial share of midlife adults provide care to both children and aging relatives, with prevalence peaking in midlife [16]. Demographic projections suggest these demands will intensify as population aging accelerates and family care networks shrink [17]. This workforce reality matters for HRD because multigenerational caregiving can reshape not only time allocation, but also continuity of participation in developmentally relevant activities—learning, practice, and opportunity structures that support performance and advancement. When caregiving escalates unpredictably—through ongoing coordination demands or acute episodes, workers may experience disrupted participation, reduced continuity of practice, and constrained access to high-visibility assignments [18]. In technology-integrated work settings, these constraints may become more salient, and variation in responsiveness or availability may be interpreted as an individual attribute rather than a situational constraint, thereby shaping evaluations and access to opportunities over time.

Technology is also embedded in caregivers' personal lives. Working caregivers report that tools can reduce worry and support connection and coordination when they are easy to use and clearly valuable; however, when technologies are poorly designed or require extensive training and troubleshooting, they add time, effort, and emotional labor to an already strained role set [19]. In other words, technology can function as support—or as an additional layer of work—depending on user fit and usability.These dynamics are especially relevant for learning facilitators because facilitation work is sequence-based and participation-intensive: preparation, delivery, and follow-through must occur reliably, often under scheduled conditions and in interaction with learners and stakeholders. For facilitators with multigenerational caregiving responsibilities, the challenge is not simply "balance," but sustaining instructional continuity and credible professional participation while work and care obligations collide across domains.

3. THEORETICAL UNDERPINNINGS

This is the research context in which the present inquiry is situated: as multigenerational caregiving becomes more prevalent, it is increasingly important to understand how learning facilitators navigate technology-integrated work while carrying substantial care responsibilities, and what their experiences reveal about the conditions that support—or constrain—sustained participation and development over time.

3.1. The HRD-CARE Model as an Analytic Framework

Multigenerational caregiving has been conceptually underdeveloped in organizational and human resource development (HRD) research, despite its growing prevalence and developmental implications [18]. Dial et al. [20] proposed the HRD-CARE model to explain how caregiving conditions interact with work systems to shape participation, developmental continuity, and access to opportunities over time. The model specifies three analytic dimensions: care-role complexity (anchored in intersectionality theory), temporal–emotional load (anchored in role strain theory), and the employment interface (anchored in HRD–human capital theory).

The theoretical driver for this paper is an investment view of development: consistent with human capital theory and HRD perspectives, capability accumulation depends on continuity of learning, practice, and access to opportunity structures [21,22,23]. The HRD-CARE model is used here as an analytical lens to examine how caregiving conditions shape the continuity of technology-integrated facilitation work—where participation, responsiveness, and follow-through are enacted through digital platforms and become visible signals in day-to-day coordination.

Care-role complexity captures the structure and intensity of an employee's caregiving responsibilities, including the number of care recipients, the unpredictability of care episodes, and the coordination demands imposed by distributed family systems. This dimension is informed by intersectionality theory, which emphasizes that caregiving burdens can be unevenly distributed across gender, age/life stage, race/ethnicity, and socio-economic position [24]. Temporal–emotional load captures the accumulated strain that arises when multiple role demands compete for finite time, attention, and emotional resources. Drawing on role strain and work–family perspectives, this dimension reflects ongoing vigilance, role prioritization, and role switching, which can disrupt the continuity of learning and professional practice [25]. The employment interface is the point at which caregiving-driven variability becomes visible and consequential within organizational systems, shaping evaluation cues, participation signals, and access to developmental opportunities [18].

Two proposed diagnostic constructs from the HRD-Caremodel further refine the analysis in this study[20]. Developmental latency refers to delayed developmental return when participation in learning, practice, or advancement is repeatedly disrupted. Prediction-error misclassification refers to instances in which constraint-driven variability—such as delayed responsiveness or schedule disruption—is misattributed to reduced motivation or capability rather than to caregiving context. Importantly, the HRD-CARE model is treated as technology-neutral: it does not assume that digital tools are inherently enabling or constraining. Instead, technology is treated as part of the coordination environment through which participation is enacted and interpreted. A fuller conceptual treatment of the HRD-CARE model is available in Dial et al. [20], to which interested readers are directed.

3.2. Purpose of Study

The purpose of this qualitative study is to examine how learning facilitators with multigenerational caregiving responsibilities use digital technologies (e.g., Microsoft Teams/Zoom and related coordination tools) to sustain full-time participation in technology-integrated work environments, and how these conditions shape developmental continuity and access to opportunities over time.

3.3. Research Questions

RQ1: How do learning facilitators with multigenerational caregiving responsibilities use digital technologies to coordinate instructional work and caregiving demands in day-to-day life?
RQ2: How do participants describe technology-integrated work shaping their developmental continuity and access to developmental opportunities over time?

4. METHOD

4.1. Research Design

This study employed a qualitative, interpretivist design to examine how working multigenerational caregivers (MGCs) use digital tools to coordinate day-to-day role demands while sustaining full-time employment, capturing lived experience and context-specific adaptation that are difficult to access through standardized measures alone [26,27]. This limitation is compounded by the multigenerational caregiving literature's inconsistent construct definitions and measurement constraints, which have prompted calls for qualitative research capable of capturing the phenomenon's full complexity and nuance [28,29,30]. Accordingly, this study uses qualitative methods to foreground micro-level experience, allowing the findings to

illuminate what role technology played in participants' coordination practices rather than presuming technology's effects in advance. The study was approved by the University of Texas at Tyler Institutional Review Board.

4.2. Rationale for Qualitative Methodology

This qualitative study was guided by phenomenology, which focuses on how individuals subjectively experience a phenomenon—its felt texture, temporality, and relational complexity—rather than offering abstract or causal explanations [31,32]. Phenomenology, rooted in the work of Husserl and later expanded by Heidegger, attends to how experiences arise in consciousness and are interpreted within social and embodied contexts [33,34]. This approach was well-suited to understanding how participants live through the ongoing coordination of work and caregiving demands in technology-integrated environments. As Percy et al. [31] note, phenomenology examines recurring structures of experience (e.g., temporality) and the felt qualities of thought across individuals' accounts (p. 77). Accordingly, the design supported an experience-near account of how MGCs make sense of and manage technology-integrated work and caregiving in everyday life [35].

4.3. Data Collection

Data were collected through semi-structured, in-depth interviews designed to elicit detailed accounts of participants' role configurations, caregiving responsibilities, work participation, and technology use in daily coordination. The interview protocol prompted participants to describe (a) the primary roles they occupy, (b) the nature and scope of their multigenerational caregiving responsibilities, (c) how caregiving intersects with work life, (d) the challenges of sustaining professional commitments while caregiving, (e) organizational supports and policies that shaped their experiences. This structure ensured that each interview captured both the practical features of technology use (e.g., communication and calendaring practices) and the meaning participants assigned to those practices within their work and family contexts. Interviews were conducted using secure video-conferencing technology when necessary to accommodate participants' schedules and geographic dispersion, and were audio-recorded with participant consent for transcription and analysis

4.4. Participant Recruitment and Selection

Participants were recruited using purposive sampling to ensure information-rich cases aligned with the study's phenomenon of interest (cite). Eligibility criteria required that participants (a) be employed full time (30+ hours), (b) haveative multigenerational caregiving responsibilities involving ongoing care for two familial generations (e.g., (grand) childcare and eldercare (c) work in roles where digital tools were routinely integrated into day-to-day coordination and professional activity (e.g., platform-based meetings, digital communication, and calendaring). Recruitment prioritized participants whose work involved facilitating learning or development activities (e.g., training, instruction, coaching, or knowledge transfer)thatcommonly occur through technology-mediated channels. Participants were drawn from multiple organizational contexts, including higher education and large corporate entities, to capture variation in technology-integrated work expectations and coordination norms. Recruitment proceeded through professional networks and referrals and followed recommendations not to exceed 10 participants. An idiographic, depth-oriented sample appropriate for interpretative phenomenological research was constructed, comprising seven participants who met all eligibility criteria and were included in the study. The participant sample is comparable to that in other

working MGC studies [31, 36]. Additionally, this study was approved by the University of Texas at Tyler Institutional Review Board.

4.5. Data Analysis

The interview datawere analyzed using the seven-phase thematic analysis method outlined by Lester et al. [37]. In phases one and two, I recorded and transcribed interviews with subsequent corrections. I imported transcripts into ATLAS.ti, a qualitative data analysis software, and reviewed those in detail. I took reflective notes to enhance familiarity with the data. I developed themes, following three stages of coding. In the initial coding phase, I identified recurring words and phrases across the dataset. During the second phase, I added additional terms to specific segments of the data to refine the analysis and coded. In the final phase, I organized the resulting codes into coding categories (sub-themes), which were converted to three major themes.

To support conceptual coherence without presuming the effects of technology in advance, interpretation was organized using the HRD-CARE model as a sensitizing analytic framework. The HRD-CARE model specifies three interdependent dimensions: care-role complexity, temporal-emotional load, and the employment interface(see Table).Within this structure, technology references were analyzed as part of participants' everyday coordination practices (e.g., communication, scheduling, participation channels, and digital cues), thereby illuminating the role of digital tools in sustaining work participation and development amid multigenerational caregiving demands. This analytic approach supported a nuanced interpretation of how technology is integrated into role coordination and how that integration relates to developmental continuity across work and caregiving contexts.

5. RESULTS

Analysis proceeded in three iterative steps, moving from experience-near detail to cross-case patterning. First, transcripts were reviewed line by line to generate initial codes that stayed close to participants' language and emphasized concrete coordination episodes—how work tasks, caregiving demands, and technology use were handled in real time. These participant-linked technology concepts are summarized in Table 1. Next, initial codes were consolidated into axial categories that clarified recurring coordination conditions and strategies used to preserve continuity (e.g., calendarized predictability, boundary rules, role collision trade-offs). Interpretation was guided by the HRD-CARE model as an analytic lens to examine how technology-relevant patterns clustered within care-role complexity, temporal–emotional load, and the employment interface; these dimensions and technology-relevant indicators are summarized in Table 2. Finally, axial categories were synthesized into three overarching themes, and the final mapping from themes to axial categories and HRD-CARE dimensions is presented in Table 3, providing a transparent bridge from data to interpretive claims.

Table 1. Participant conceptual open coding related to technology

Participant	Conceptual Open Coding Related to Technology
P1	Technology as continuity infrastructure (competence expands participation); Zoom/Teams as "presence substitute"; flexibility enabled by virtual participation and nonstandard work hours; technology supports instructional/organizational coordination under caregiving constraint.
P2	Technology-enabled family continuity across distance (video/messaging as relational maintenance); intentional reduction of communication frequency as self-regulation

Participant	Conceptual Open Coding Related to Technology
	(managing emotional/energy load); technology supports care connection without physical presence.
P3	Technology enables "care-at-a-distance" (online ordering/delivery coordination); mobile work while caregiving is present (laptop-based work continuation); virtual meetings as a flexibility resource; technology supports simultaneous role enactment (work + care proximity).
P4	Boundary work through communication rules (delayed responses; work hours protected); scheduling as advance coordination for caregiving appointments; technology has functional limits (delivery not feasible due to physical access barriers); opportunity cost when care requires time blocks (missed clients).
P5	Calendarized coordination to stabilize fragmented days (recurring meetings as predictability infrastructure); cross-domain calendar management (work + family calendar alignment); technology-mediated scheduling reduces collision risk; role interdependence managed via meeting design (shortened meetings, alternating weeks, emergency-only reschedules).
P6	Platform-enabled participation reduces travel burden (e.g., Teams as a substitute for travel); work-from-home improves the feasibility of caregiving support; and technology enables continuity of work with caregiving present (remote work increases the feasibility of care support relative to prior constraints).
P7	Communication triage rules (call vs text to signal urgency); constrained development participation (training repetition; limited value); organizational constraints limit flexibility (attendance policy); "technology co-occurs with depletion/recovery practices(withdrawal/streaming as downtime).

Table 2: HRD-CARE model open coding with technology considered

Participant / Role	Care-Role Complexity (Intersectionality)	Temporal–Emotional Load (Role Strain)	Employment Interface (HRD–HCT)	Observed Technology Pattern in Work/Care Workflow
P1 – Male Professor	Primary support for mother (Alzheimer's) and grandchildren; spouse support present; role complexity includes care + household/provider responsibilities.	Long-duration caregiving, strong caregiver identity/pride, and intensive condition contributed to stepping back from leadership; using routine (e.g., gym) to sustain functioning.	Flexible role; employer aware; care-friendly culture; earlier career avoided non-caring environments; leadership pathway altered by care demands.	Uses Zoom/virtual platforms as participation substitute; high tool competence ("superpower" during COVID); relies on digital record-keeping/time-management devices; proactive, routine-based digital organization.
P2 – Professor	Transnational caregiving to mother and grandmother; only child;	Time-zone strain; long-running vigilance; shifted coping	Flexible academic role; employer aware/supportive; can maintain	Uses WeChat/Zoom for relational continuity, coordination, and rapid contact; technology framed as a "blessing" enabling remote

Participant / Role	Care-Role Complexity (Intersectionality)	Temporal–Emotional Load (Role Strain)	Employment Interface (HRD–HCT)	Observed Technology Pattern in Work/Care Workflow
	geographic distance adds coordination complexity; filial expectations noted.	toward self-care and reduced communication frequency to manage energy/emotional load.	work continuity (e.g., tenure tasks) despite limited physical presence abroad.	presence and coordination with doctors/peer network.
P3 – Professor	Substantial grandchild care (up to ~20 hrs/week) + emerging parent care (Alzheimer's); strong friend support network.	Long duration of caregiving; early-stage care escalation for parent; time scarcity and fatigue (early wake times); tenure-track demands add a persistent load.	Flexible academic structure supports continuity (writing/grading); culture described as care-friendly; work can be reorganized across time.	Uses laptop/mobile work while caregiving is present; uses virtual meetings; uses online ordering/delivery for care-at-a-distance; relies on calendars/systems for organization; uses texting to coordinate tasks.
P4 – Corporate Trainer	Primary caregiver for mother-in-law + support for grandchildren; gendered expectations described; care recipient geographically separated from some work activity.	Relationship strain with care recipient; care demands unpredictable and "expected to be immediate"; role collisions create opportunity costs (missed clients).	Schedule autonomy exists, but client-facing work is still constrained by business hours; flexibility is limited when support systems operate during the same hours.	Uses video conferencing for trainings/meetings; implements communication rules and delayed responses; automates/structuresmorning"well checks"; notes functional limits of tech (delivery not feasible due to home access barriers).
P5 – Male Corporate Trainer	Complex household structure: remarried, blended family (multiple children) + ongoing support for mother (health/finances); travel demands present; shared caregiving with spouse but schedules differ.	Continuous role switching; school coordination and sick days; travel required; caregiving episodes (e.g., surgery complications) add intensity; time scarcity is chronic.	Has control of schedule but must meet client obligations; performance pressures forced more disclosure; typical work hours and preset commitments constrain adaptation.	Uses recurring meetings and cross-domain calendar integration (work + family + school); uses virtual facilitation, calls while mobile; uses shared Google Calendar; meeting "design" (shorter meetings, alternating weeks, emergency-only reschedules) to stabilize time.

Participant / Role	Care-Role Complexity (Intersectionality)	Temporal–Emotional Load (Role Strain)	Employment Interface (HRD–HCT)	Observed Technology Pattern in Work/Care Workflow
P6 – Corporate Trainer	Multi-role care: financial support for adult child + caregiving for younger child; relies on neighbors/friends as auxiliary support.	Persistent school/health coordination; long commute historically; caregiving spans years; turned down promotions (load/constraints).	Flexibility increased over time; remote work is newly valued; care-friendly culture; can speak openly; participation improved with WFH options.	Uses enterprise platforms (Teams) to avoid travel (e.g., training completed virtually); remote work increases the feasibility of caregiving support; uses grocery delivery; and real-time coordination with neighbors/child support network.
P7 – Corporate Trainer	Only child supporting mother with health needs + parenting; primary support role; limited backup described.	Chronic worry and frequent non-urgent contact from care recipient; constrained development time; depletion and recovery needs salient.	Describes a non-caring culture; strict attendance/point system; limited flexibility; schedule shifts (nights/weekends) to cope; cannot discuss care stress openly.	Uses communication triage rules (call vs text) to signal urgency; technology co-occurs with depletion practices (withdrawal/streaming); limited ability to use tech for flexibility unless it becomes “extra” work.

Table 3: Mapped themes, axial categories, and HRD-CARE dimensions

Axial Coding Category	Technology Associated Open Codes	Primary HRD-CARE Dimension	Thematic Category
Technology as continuity infrastructure	Tool competence expands participation; virtual meetings as a substitute for presence; avoided travel via enterprise platforms; mobile work while caregiving is present; technology-enabled family connection across distance; remote caregiving coordination (ordering/delivery); limits of tech-enabled care.	Care-Role Complexity (primary) + Employment Interface (secondary)(technology used to manage structural care configuration, distance, and role demands)	Technology as continuity infrastructure
Calendarized predictability and time stabilization	Recurring meetings reduce volatility; non-negotiable calendar blocks; alternating meeting schedules; advance reservation for caregiving	Temporal–Emotional Load (reducing collision pressure via predictability and pacing)	Boundary work through digital coordination

Axial Coding Category	Technology Associated Open Codes	Primary HRD-CARE Dimension	Thematic Category
	appointments; cross-household calendar integration; selective participation based on calendar alignment.		
Boundary negotiation and access regulation	Work-hour protection; urgency triage rules (call vs. text); delayed-response norms; selective availability; avoiding overlap with family obligations; role-based prioritization.	Temporal–Emotional Load (protecting cognitive/affective capacity through access control)	Boundary work through digital coordination
Role collision and opportunity trade-offs	Missed clients due to caregiving; scheduling conflicts across work and care; inability to attend overlapping commitments; fragmented days; time compression; missed events.	Temporal–Emotional Load *(and secondarily Employment Interface)*	Boundary work through digital coordination *(and feeds Theme 3 when it affects development access)*
Developmental constraint and latency	Difficulty pursuing education; repetitive/low-yield training; postponed certification; limited access to advancement opportunities; attendance rigidity; constrained flexibility for learning.	Employment Interface (access to development resources and gateways)	Developmental trade-offs and delayed growth
Energy management and recovery practices	Withdrawal for decompression; streaming as recovery; cognitive fatigue; emotional depletion; need for solitude after coordination load.	Temporal–Emotional Load *(often expressed downstream at the Employment Interface)*	Developmental trade-offs and delayed growth

6. DISCUSSION

Digital technologies are now integrated into the organization, coordination, and delivery of professional work across employment contexts. For learning facilitators, day-to-day performance often depends on technology-enabled interaction, scheduling, and follow-through—especially when instruction, stakeholder engagement, and meetings are distributed across time and place. Yet, in participants' accounts, *participation* in technology-integrated work was not simply a matter of access or tool use. Technology has shaped the requirements for remaining credible, responsive, and continuously engaged while managing multigenerational caregiving responsibilities. Across cases, technology expanded the range of feasible participation, but it did not eliminate time scarcity or role collision. Instead, technology often became part of the coordination burden itself—supporting continuity while also increasing the need for scheduling discipline, boundary-setting, and selective investment in development.

Consistent with the analytic progression from first-cycle codes to mapped themes (Tables 1–3), three themes capture these patterns: (1) technology as continuity infrastructure, (2) boundary

work through digital coordination, and (3) developmental trade-offs and delayed growth (Table 3). The sections below elaborate on each theme using illustrative participant accounts (Table 1) and show how the themes map onto HRD-CARE dimensions when technology is treated as part of the work–care workflow rather than an external add-on (Table 2).

6.1. Technology as Continuity Infrastructure

The first theme reflects how participants described technology as a practical infrastructure for maintaining continuity across work and caregiving demands when physical presence was constrained. Technology was not framed as an optional enhancement; it functioned as a substitute for participation and a coordination mechanism that preserved work delivery and relational connections under complex role configurations (Tables 2–3). One participant characterized videoconferencing competence as a "superpower," describing how Zoom enabled continuity when others lacked familiarity: "Technology is key… There are certainly times when we're able to live life and join through technology… very often" (P1).

Continuity was also evident in technology-enabled connections across distances. A participant supporting family members across national boundaries emphasized that physical presence was limited, but connection and coordination could be sustained through WeChat and Zoom: "I can just call them and zoom in and WeChat in so that we can still see each other… every week" (P2). Participants also described care-at-a-distance practices that preserved work participation by reducing relocation demands, such as ordering items for delivery so an aging parent could avoid leaving a spouse requiring supervision: "whatever I can do to just make life a little easier… helping them… at a distance" (P3).

At the same time, continuity was not automatic and had functional limits. One participant noted that delivery-based support was not feasible due to home access constraints: "delivery is not an option" (P4). Across cases, technology operated as continuity infrastructure by extending feasible participation across work and care demands, while also revealing that continuity often required active coordination and depended on both care-role configuration and workplace systems that enabled substitution (Tables 2–3).

6.2. Boundary Work Through Digital Coordination

The second theme captures how participants used technology-mediated scheduling and communication practices to manage role collision, reduce volatility, and protect limited time and attention (Table 3). Participants described calendars, recurring meetings, and coordination routines as stabilizing mechanisms for fragmented days. One participant noted that work was "very, very busy," requiring careful coordination of Teams and face-to-face meetings so they did not overlap with children's "crucial things" (P5). Another described establishing alternating, recurring meetings that were "settled on the calendar," limiting reschedules to emergencies: "I can't reschedule this unless it's an emergency… [it] has helped… with my time schedule… and my customers relationship" (P5).

Boundary work also appeared through explicit communication rules that regulate access and distinguish urgency from preference. One participant described delaying caregiving responses during work hours and time-bounding support: "I'm working and I can't do that right now… it'll be 5:00 before I can run by Walmart" (P4). Another emphasized escalation norms: "if you need me call… If it's an emergency, that's not an emergency message" (P7). These accounts show that boundary-setting functioned as a coordination requirement in technology-integrated work, where interruptions are always possible and responsiveness can become evaluation-relevant.

Participants also described cross-domain coordination complexity in household structures that amplified scheduling demands. For example, one participant described blended-family scheduling as "a nightmare," noting that shared digital calendars supported prioritization across work and family systems (P5). Taken together, these accounts show that technology did not merely blur boundaries; participants used technology to actively construct workable boundaries through predictability systems (calendars, recurring cadence) and access rules (communication triage), reducing collision risk under persistent time constraints (Tables 2–3).

6.3. Developmental Trade-Offs and Delayed Growth

The third theme reflects how participants described constraints on development participation under conditions of role overload, time scarcity, and depleted energy. Even when technology enabled continuity of work participation, participants reported limited capacity to pursue education, training, and advancement. One participant stated directly, "it's very hard to further my education right now" (P7), describing training that repeated prior content and did not produce new credentials or skill development: "it's a training I've been to twice already… not giving me any type of certification… not teaching me a new aspect of my job" (P7).

Participants also described organizational contexts that reduced flexibility and narrowed access to development resources. One participant emphasized a "strict attendance policy" and limited flexibility, describing the environment as "not a caring culture" (P7). Opportunity costs were also visible when caregiving required immovable time blocks: "I miss out on clients sometimes because I need to take her somewhere" (P4). Finally, participants described recovery practices that signaled depletion and reduced discretionary capacity for development, including retreating for solitude and disengaging through streaming as downtime (P4; P7).

Overall, these accounts align with developmental constraint and delayed growth: development was deferred not due to lack of motivation, but due to time compression, depleted energy, and workplace structures that assume stable availability and continuous participation (Tables 2–3). In technology-integrated work, where responsiveness is continuously visible, disrupted cadence can be misread as reduced commitment rather than as structured variance produced by caregiving role collision. Participants compensated through scheduling discipline and continuity tactics, but development still lagged when systems continued to reward uninterrupted participation and treat availability as a stable personal attribute rather than a context-dependent condition.

6.4. Limitations and Future Research

This study offers experience-near insight into how learning facilitators with multigenerational caregiving responsibilities sustain full-time employment in technology-integrated work settings, but several limitations should be noted. First, the sample was small (N = 7) and purposive, spanning learning facilitators in both university and corporate contexts. That design supports depth but limits transferability across sectors, job structures, and institutional conditions (e.g., shift-based facilitation, hourly roles, smaller firms, or highly standardized training environments). Future work should extend sampling across employment contexts and compare subgroups (higher education versus corporate learning; internal versus client-facing facilitation; salaried versus hourly arrangements) to clarify which patterns reflect learning facilitation as work and which reflect broader caregiver constraints.

Second, the findings are based on retrospective self-reports from interviews. That approach is appropriate for capturing lived experience and meaning-making, yet it can be shaped by recall bias, selective emphasis, and the normalization of chronic strain. Future studies can strengthen

credibility by pairing interviews with short-horizon methods—such as brief time-use diaries, weekly check-ins, or artifact-based prompts—to capture how coordination unfolds across days, including meeting density, interruption patterns, and recovery opportunities.

Third, this study treats technology as part of the ordinary coordination environment rather than as a discrete intervention. Future research could incorporate artifact-informed designs that examine coordination structures directly (e.g., meeting cadence norms, scheduling practices, communication expectations, and facilitation workflow design) to show how the technology-integrated learning environment enables continuity in some moments while intensifying visibility and responsiveness pressures in others.

Fourth, the study took place within a specific socio-temporal context in which expectations regarding responsiveness, availability, and instructional continuity continue to evolve. Because these norms shift across organizations and over time, the same coordination practice may be interpreted differently in another setting. Future research should examine how organizational design choices—such as flexibility practices, meeting norms, attendance systems, and support policies—shape participation in learning work and access to development, including whether changes reduce developmental latency (delayed engagement in training, advancement, or credentialing) and reduce prediction-error misclassification (mistaking constrained availability for low commitment or low capability).

Several directions follow from these limitations. Comparative qualitative studies should examine learning facilitators who are multigenerational caregivers alongside facilitators without caregiving responsibilities and caregivers in non-learning roles to determine what is distinctive about facilitation work under constraint. Cross-context investigations should compare settings with different constraint structures (high autonomy versus strict attendance; low meeting load versus stacked meetings) to identify which conditions stabilize instructional delivery and which conditions quietly erode access to development. Longitudinal designs that follow participants over time would help establish whether technology-integrated coordination sustains instructional continuity while delaying developmental trajectories, and which organizational supports enable development to resume. Finally, intervention-oriented studies should test practical adjustments to the learning system—such as meeting-cadence redesign, clearer response-time norms, protected preparation time, and asynchronous facilitation options—and evaluate their effects on instructional quality, participation, and longer-run development opportunities.

6.5. Conclusions

This study examined how learning facilitators with multigenerational caregiving responsibilities use technology-integrated work practices to sustain full-time employment and instructional continuity. Using the HRD-CARE model as an analytic lens, the findings show that digital tools operate as continuity infrastructure, enabling remote participation, care-at-a-distance, and routine follow-through—while simultaneously intensifying coordination demands and making responsiveness more visible and evaluation-relevant. Participants relied on calendar predictability, communication triage, and boundary rules to reduce role collision, but these tactics primarily stabilized delivery rather than freeing capacity for higher-yield development. Viewed through an HRD–human capital (HCT) frame, this matters because constrained time and energy can produce developmental latency, and caregiving-driven participation variance can be misclassified as low commitment or reduced capability at the employment interface. For organizations, the practical implication is that technology may protect short-term instructional performance, but it does not automatically protect the accumulation of long-term capabilities. HRD systems should therefore examine meeting density, after-hours response norms, and

flexibility design to ensure that learning facilitators can sustain both day-to-day execution and continued development over time.

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