



The Digital Lives of Student Mothers: A Consideration of Technologies That Support or Erode the Student/Parent Boundary

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ABSTRACT

A growing body of work explores the well-being of students. However, little work has addressed the experiences of student mothers, who must juggle the demands of study and childcare simultaneously. The rise of the student mother is taking place at a time when student learning and engagement as well as childcare has become highly digitised. Existing literature on work/life balance suggests a key issue for student mothers is management of the work-family border, such that they can choose to segregate or blend roles as appropriate. In this study, we used work-family border theory to examine the role that technology plays in supporting both the segregation and blending of student and parent roles, making recommendations for the ways that boundary maintenance might be more explicitly considered in digital systems design.

1. Introduction

Increasingly, adults with young children are joining academia (Moreau, 2019; Smith and Wayman, 2009). Yet, despite a distinct rhetoric of social mobility, equality and fairness to enable mature students gain access to university (Brooks, 2012), we still find an ‘invisibility of student parents’ and their marginalisation in higher education (HE) policies as well as physical spaces (Moreau, 2016; Moreau and Kerner, 2015). Universities are still primarily organised to cater for young students without childcare responsibilities (Marandet and Wainwright, 2009), although recent work has tried to better understand engagement in HE for students with dependent children.

Much of this work describes the student parent as if there is only one kind of student, or indeed parent. We recognise that the experiences of student parents may be very different depending on individual circumstances but also upon the level of study, mode of study, and other commitments, including the need for part-time employment. Postgraduate and doctorate level students are an interesting group in this regard, as they face some additional demands when compared to their undergraduate counterparts. We know doctoral students experience uncertainty, stress (Pappa et al., 2020), imposter syndrome (Chakraverty, 2020) and an increased likelihood of developing mental health problems (Levecque et al., 2017). We also know that attrition rates for these students are high (Groenvynck et al., 2013; Vassil and Solvak,

2012). For international doctoral students, these worries are exacerbated by a lack of familiarity with the academic system, culture, and language, making them more vulnerable to academic stressors (Laufer and Gorup, 2019). Laufer and Gorup apply the term ‘othering’ to international doctoral students’ discontinuation experiences as they are often depicted as outsiders. The experience of othering can lead to attempts at ‘identity negotiation’ for doctoral students, solidifying their position in a competitive academic environment (Pappa et al., 2020).

The focus of this work comes at a time when student learning and engagement has been highly digitised. In addition to the specific requirements of any one discipline, students are typically required to register for their degree and manage their progression information through a centralised data system, enrol on an e-learning platform, submit work in digital format, often via a plagiarism detection service, negotiate a student finance portal and make use of a range of collaboration and online video systems (Funamori, 2016; Khalid et al., 2018). Students are then introduced to a range of opt-in digital offers, including departmental Facebook pages, student WhatsApp groups and other social media platforms designed to support their membership of a new learning community (Sánchez et al., 2014). For a student parent, these resources may serve to make learning a more flexible process, but the ‘always on’ nature of digital exchange could add to the stresses of managing dual roles. This is the focus of our paper, where we ask to what extent technologies support or erode these role boundaries. Below, we

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outline the importance of related work describing the experiences of student parents, specifically student mothers, role conflict, and the increasing digitisation of motherhood.

1.1. Student parents

Much has been written specifically about role conflict in student parents, and the ways they manage academic, familial and professional responsibilities when they are 'time-poor' (Moreau and Kerner, 2015). We know that students with preschool-aged children have less time for university, comparable with peers with older or no children. Time spent on childcare is the primary reason for this difference (Wladis et al., 2018). In particular, student mothers seem to have insufficient time to do everything, a problem often observed in working mothers (Rout et al., 1997). Sallee (2015) outlines two strategies that student parents may adopt to cope with this role conflict: *compartmentalisation*, and *role elimination*.

Compartmentalisation involves relying on time management techniques to allow focus on one role at a time (Martinez et al., 2013). Compartmentalisation may also involve downplaying the role of parent in academic contexts, and downplaying the role of student outside academia (Lynch, 2008). Role elimination involves declining to take part in hobbies and time-consuming activities, as well as professional development opportunities, because of family commitments (Wilson, 1997). These conflicts have far-reaching effects, with postgraduate women being less likely than their male counterparts to pursue an academic career because of perceived incompatibility with motherhood (Crabb and Ekberg, 2014).

Previous work has outlined prominent themes of isolation and guilt amongst student parents, although often with a focus on undergraduates. Investigating the learning needs and experiences of students with dependent children in a university setting, Marandet and Wainwright (2009) interviewed student parents and discovered a sense of exclusion from their very early experiences in HE. A lack of reference to student parents in marketing materials, token gestures to help with childcare provision, and a ban on children on campus led to perceptions of disadvantage compared with their childfree peers. Brooks (2015) conducted in-depth interviews with student parents to compare experiences between the UK and Denmark, demonstrating gendered as well as cultural differences in student parent roles. In the UK, despite participants expressing pride that they were portraying a positive role model for their children, the student parents felt overwhelming guilt about their academic choices. In addition, student mothers were much more likely to report guilt about combining study and childcare than student fathers. For fathers, the main source of guilt related to their previous 'breadwinner' role. In contrast, in Denmark many believed that state government played an important role in childrearing, alleviating much of the feeling of guilt for new parents.

In short, student parents describe their navigation of academia as a struggle (Moreau and Kerner, 2015). Indeed, Estes writes that student parents 'are expected to be bad parents, bad students, or both' (Estes, 2011, p.198). During the past century, there have been substantial changes in parental roles, with an increasing number of women entering the workplace and more men becoming involved with childcare and domestic responsibilities (Goldscheider et al., 2015). Despite this shift, parenthood still disproportionately affects women, with cultural norms identifying childcare as 'women's work' and mothers still most likely to be the main caregiver (Boyer, 2018; Chib et al., 2014; Craig, 2006). For these reasons, we focus on the experiences of student mothers in our work.

1.2. Demands as a student mother

Alsop et al. (2008) argue that Western culture has a long history of excluding women from education, noting the persistent view that 'if women engaged in intellectual pursuits their reproductive capacities would be

compromised' (p.630). Despite this, the past few decades have seen a significant change in familial roles, moving from a 'male-breadwinner' model of family, in which men took responsibility for earning and women for unpaid care, towards an adult worker model where everyone is expected to work (Lewis and Giullari, 2005). This shift has been coupled with the rise of neoliberal feminism – a variant of feminism which centres around a 'happy work-family balance' (Rottenberg, 2018, 2019). The work-family balance is an inherently gendered issue, typically focusing on the 'double binds' working mothers face and gendered gaps in care (Sorensen, 2017). As Rottenberg notes, in contemporary society women are expected to engage in intensive labour to become their 'best self', both professionally and personally, and achieve the contemporary norm of female accomplishment. Indeed, mothers are expected to have the perfect life: a good job, happy family, and thriving social life (McRobbie, 2015).

This ideal can place significant strain on student mothers, who must balance the competing demands of education and care. For example, Marandet and Wainwright (2009) emphasise that the bulk of caring work is still largely undertaken by women, and therefore the addition of academic work will undoubtedly be harder than for those without caregiving responsibilities. These perceptions may have developed from discourse around 'intensive mothering' (Hays, 1996), which describes the way mothers are expected to dedicate increasing resources (time, money, energy) in order to ensure their children thrive- amplifying cultural demands that this is predominantly a mother's role. These ideologies around providing the best for your child socially, cognitively, and developmentally (Budds et al., 2017), preclude the idea of a mother undertaking something for themselves, like HE.

Taking on the responsibility of learning whilst also maintaining family responsibilities is a great task, and this decision may influence many aspects of life. Motherhood already requires huge effort to meet differing demands, so adding the role of student can create conflict in terms of time and energy (Utami, 2019). A 'time squeeze' to fit in home as well as academic demands often results in unhappiness and fatigue (Augustine et al., 2018). In addition, being both a mother and a student can cause anxiety around finances (Nikolaeva, 2018), time pressures (Sallee, 2015), role conflict (Home, 1998) and physical or mental pressures (Kreischer, 2017). Student mothers may also feel angry, lonely, restless, and generally perceive a lack of time to fulfil both mother and student roles (Taukeni, 2014).

Several studies outline the struggles experienced by student mothers across cultures. In Iran, for example, student mothers talk of sacrifices to their academic work to care for their unwell children, having ultimate responsibility for the planning of alternative childcare (Moghadam et al., 2017). In Namibia, student mothers report feeling they don't have enough time to study and parent, resulting in other aspects of life being shunned, such as medical appointments or seeing friends (Taukeni, 2014). Work with First Nations mothers in Canada highlights difficulties in being a student mother and the value that having close family support can provide (Rowe, 2017). In the US, Lynch (2008) finds a downplaying of the maternal role in the academic realm, described as 'maternal invisibility'- for example, by not displaying artefacts associated with children in office spaces. And yet, we see evidence of small gestures that go a long way to improve the lives of student mothers. In the United Arab Emirates, minor faculty allowances such as allowing mobile phones in class in case of child-related emergencies can vastly improve the university experience for new mothers (Dickson and Tennant, 2018).

Studies in this context have focused on undergraduates (Taukeni, 2014), postgraduates (Sallee, 2015; Utami, 2019), or a mixture of both (Moghadam et al., 2017). Postgraduate student mothers, however, may face distinct challenges related to the nature of work/life balance. In a US study of interviews with postgraduate student mothers, Lynch (2008) cites that attrition rates for this group is one of the most serious issues in American HE, with their academic pathways more likely than their male counterparts to be interrupted by family needs (Ehrenberg, 2004). Likewise, Springer and colleagues (2009) argue that being a graduate

student mother is an important 'pipeline leak' for women in academia, citing that graduate students with children are less likely to enter research universities (Williams, 2004). In addition, they are less likely to be in a tenure track position four years after graduating in comparison to other students who did not have children while in graduate school (Spalter-Roth et al., 2004).

Institutional assumptions around learning, and the amount of extra work that women need to do in order to 'fit in' has been raised in much of this previous work. Understanding how universities support and encourage student mothers is therefore important to consider. Greater levels of support from faculty for these students can improve retention and academic performance (Sax et al., 2005). Research in the United Arab Emirates, where the prevalence of student mothers is high, demonstrates that faculty staff can be supportive, empathetic and more flexible by tailoring course delivery and assessment with parents in mind (Dickson and Tennant, 2018). Their work also demonstrated an approach of subverting official guidelines (such as maternity leave policies) in order to benefit the student by 'turning a blind eye'.

1.3. Role conflict and spillover

Barnett and Marshall (1992) write about multiple roles and the link to psychological distress. Specifically, they discuss the idea of 'spillover' whereby aspects of work creep into family life, and vice versa (Staines, 1980). It has been suggested that spillover from family to the workplace is more likely for women, but spillover from work to family is more common for men (Keene and Reynolds, 2005; Pleck, 1977), although there is some recognition that these roles may be changing (Kim et al., 2019; Lin and Burgard, 2018). Student mothers are still usually responsible for domestic work (Brooks, 2013; Edwards, 1993), which adds significantly to their existing academic and childcare responsibilities. However, it may not necessarily be the physical chores that cause strain, but the mental load or the emotional labour that they are burdened with (Barberio, 2018). We are interested in the strategies used to think about these divisions of labour, whilst being mindful that the digitisation of work and home means that ways of working are evolving.

Taylor and Luckman (2018) discuss this evolution in terms of the 'new normal', recognising not only the increasing need for permeability between personal and professional lives but also the development of new forms of work that don't quite sit within the traditional model. They give the examples of 'mum bloggers' who share their experiences of parenthood, attracting large readership and, in turn, the attention of marketing and public relationship practitioners (Archer, 2019). These 'mumfluencers' provide an interesting challenge to the spillover construct, given that they simultaneously juggle the responsibilities of work and care; therefore, conflating the realms of work and family life.

This issue of permeability is picked up by Clark (2000) in her 'Work/Family Border Theory', where she argues 'people are border-crossers who make daily transitions between two worlds - the world of work and the world of family' (p.748). Work/Family Border Theory postulates that individuals are proactive in managing their borders between work and non-work. The theory emphasises the connection between these worlds, suggesting events in one domain can influence those in the other, acknowledging that work and family systems are different but interconnected (Katz and Kahn, 1966; Staines, 1980). Individuals negotiate work and family spheres and put borders in place (or remove them) to achieve a desired balance.

Borders are said to take either a temporal, physical, or psychological form. Temporal and physical borders define when and where domain-relevant behaviours take place (e.g. defined working hours, walls, and doors), whereas psychological borders are self-created boundaries that segregate different thinking patterns and emotions. Three constructs from this theory are particularly useful to note: boundary permeability, boundary flexibility, and blending. In the context of student mothers, boundary permeability reflects the extent to which an individual in one

role (e.g. parent) might be interrupted by the demands of another role, with boundary flexibility reflecting the capacity of the boundary to be moved temporally or physically (e.g. students can 'attend' lectures or seminars whilst in the home environment). Blending refers to increased permeability and flexibility around the boundaries of work and home.

The impact of technologies on permeability, flexibility and blending is interesting here, not least because it has been found that a permeable 'home border' (i.e. where technologies mean that work or study can invade the home) is associated with high stress, whereas a flexible 'work border' (where work or study can be scheduled to fit around other demands) is considered beneficial (Leung and Zhang, 2017). We therefore adopted this work/family border framework to structure interviews and guide our analysis.

2. The role of technology

Digital resources are increasingly being utilised to support the multiple roles mothers occupy, addressing the challenges described above. Mothers are relying on the internet and social media as sources of information on all aspects of parenting (Laws et al., 2019; Lupton et al., 2016; Newhouse and Blandford, 2017; Yurman, 2017), using digital resources to gather information from multiple sources quickly and anonymously (Moon et al., 2019). A proliferation of mobile apps, social media platforms, websites, blogs and forums offer advice, with research suggesting these kinds of digital resources can be invaluable for parents (Doyle, 2013; Lupton, 2017; Pedersen and Lupton, 2018) and result in a 'pool' of parenthood-related expert and experiential knowledge (Lyons, 2020). In addition, the domestication of commonplace technologies, such as mobile phones (de Reuver et al., 2016) has meant that new social connections can move easily from the digital to the physical, with mobile apps that make it possible for mothers to connect with each other and meet up face-to-face (Thomas et al., 2019).

During the transition to parenthood, social media can be used to legitimise new identities, with digital spaces taking on greater significance in order to establish or 'test' out their new role (Johnson, 2015). Studies have explored how social media might support reflection for individuals changing identities as they transition to becoming a parent (Trujillo-Pisanty et al., 2014) and the ways in which communication technologies build confidence and support the portrayal of multiple identities for new mothers in a liminal space (Gibson and Hanson, 2013; Mudge and Connor, 2016). We are also now seeing a different side to motherhood portrayed online with the advent of the 'slummy mummy' - someone who is, amongst other things, struggling to balance work and children (Littler, 2013), with mothers sharing their frustrations of parenthood and challenging stereotypical portrayals online (Orton-Johnson, 2017). In addition to these nuanced ways that mothers may use technology to connect with others and find support, we see the proliferation of use of social media to share or showcase children - in the form of 'sharenting'. This practise of parental digital sharing has received attention because it is often done solely by mothers (Ammari et al., 2015), is dominated by idealised images of a 'happy family' (Le Moignan et al., 2017), and is considered a gendered practise which adds more pressure to women's day-to-day roles (Lazard et al., 2019).

Digital technologies have also influenced family boundaries. In a review of literature in this field, Carvalho et al., (2015) examined the relationship between communication technologies and family functioning. They report that boundaries between the family environment and work are being blurred by the domestic use of communication technologies, citing home computers (Huisman et al., 2012), the internet (Wajcman et al., 2010), and mobile phones (Wajcman et al., 2008) as examples of how work permeates home borders. Communication technologies are said to alter the flow of information across family boundaries and Mesch (2006) suggests the dynamics of families with access to them differ from those without. In addition, computer literate families experience reduced family time, as well as increased family conflict.

Technology can also lead to the disappearance or blurring of work-

life boundaries (Bødker, 2016, Yurman, 2017) as when tablets or smartphones are used in the home for work and as a tool to keep children entertained. Much has been written about family dynamics and technology use. Mazmanian and Lanette (2017) reflect on the ‘rules’ of family technology use, and find that parents sometimes engage in monitoring of digital content through default apps, such as children’s profiles on Netflix- yet report feelings of guilt and inadequacy when they admit not having any clear rules in place. This can lead to conflict between parents with different opinions about family technology use (Derix and Leong, 2020). In a report on ‘screen time’, Blum-Ross and Livingstone (2016) note that parents will often have different goals around limiting children’s access to technology, and they tend to pursue them inconsistently. This can make attempts to moderate screen time relatively ineffective, but which also means it becomes difficult to assess the impact of parental intervention.

Boundary management issues are common when we consider the work/life balance of students. For example, Lim et al. (2017) note that technologies can be used to promote flexibility, to the extent that the home can effectively become a place of study, with the associated ‘cost’ of greater permeability and the ultimate erosion of home boundaries. Their work also highlights the ways that different communication channels could be used to strengthen boundaries. However, theirs was a study of young undergraduate students with no mention of any kind of childcare responsibilities. To our knowledge, no work has explicitly addressed the role of technologies in boundary maintenance for student mothers.

3. Rationale

Our work sits at the intersection of motherhood, higher education and technology. Whilst there is a literature around parenting, technology adoption, and students, we know very little about the ways student mothers use technologies to manage the borders of motherhood and academia, and the impact this has on their lives. This lack of understanding about how technology might be used by student mothers led us to our research questions:

- 1 Does technology support or erode a work-family border for student mothers?
- 2 How does the permeability of these borders impact on student mothers’ lives?

4. Method

4.1. Participants

We recruited 11 student mothers to take part in one-to-one interviews. Participants ranged from 31 to 43 years of age (mean 37, S.D. 3.8) and came from eight different HE institutions across the UK. They cared for children ranging from 6 months to 14 years old. Six participants also held part-time paid jobs (Abigail; Kara; Naomi; Rose; Sadie; Sandra). Table 1 provides further demographic information about the participants (with pseudonyms). To preserve anonymity, we have purposefully omitted individual nationalities of the participants. However, they came from a variety of countries including Canada, Croatia, Finland, Iraq and the UK.

4.2. Recruitment

We adopted a constructivist epistemology, embracing the varied discourses of our participants and acknowledging that knowledge is constructed, subjective, and realities are multiple (Lincoln and Guba, 1985). We sought out participants who would be able to give rich accounts of their experiences being a student mother, rejecting the notion of statistical-probabilistic generalisability in favour of ‘information power’ (Malterud et al., 2016), i.e. we stopped when we had generated

Table 1
Participant information.

Pseudonym	Age	Level of study	Subject	Year of study	Full / part time	Child’s age [years]
Abigail	38	Postgrad	Psychology	1	PT	4, 6
Caitlin	34	PhD	Law	2	FT	2
Jenny	36	PhD	Business	2	FT	4, 7
Julia	43	PhD	Health	3	PT	12, 14
Kara	40	PhD	Sociolinguistics	4	PT	4, 8
Karina	31	PhD	Drama	2	FT	4
Naomi	37	Postgrad	HR	2	PT	6 mos
Rose	43	PhD	Film	Comp	NA	3, 7
Samantha	34	PhD	Education	2	PT	10 mos, 9
Sandra	36	Clin dip.	Psychiatry	1	PT	3, 6
Sadie	34	PhD	Education	4	PT	12

an information rich dataset that fully addressed the aims of the study.

Participants were predominantly recruited via online support groups, including the ‘Women in Academia Support Network’ (WIASN) and ‘Mothers in Academia’ on Facebook (with permission from group administrators). Eligibility required participants to identify as a parent/carer to a child under the age of 18 and be currently enrolled as a postgraduate student¹. We shared a digital recruitment poster to summarise the study for participants, asking “Are you a student and a mother? A new project is exploring the everyday experiences of student mothers and how they use digital services to manage their lives”.

Prospective participants e-mailed the lead researcher to confirm their interest in the study and were sent an electronic copy of the study’s information sheet and consent form. Participants were required to return the signed consent form via e-mail prior to interviews commencing. Everyone who contacted the researcher was considered for participation, with the final number taking part being determined by calendar availability. The study was carried out in accordance with the recommendations of Northumbria University Ethics Committee. Note that recruitment took place prior to the Covid-19 pandemic and so we gathered no data addressing the experiences of student mothers during lockdown.

4.3. Interview procedure

The first author conducted one interview face-to-face (the participant came from our own institution and was on campus), with the remaining ten taking place over Skype. All interviews were audio recorded to allow for subsequent verbatim transcription. Interviews took between 30 and 60 min, lasting an average of 43 min. A semi-structured interview protocol focused on gaining participant narratives about their current student experience, alongside their experiences as a parent. The interviews allowed for rich discussion of technology use, and in particular any digital resources participants used in the home or as a student they felt were noteworthy. We also asked participants to share photographs of the resources they described during their interview; sent on to the researcher via e-mail following the interviews. We illustrate one of these alongside qualitative data in the following results section, with permission from the participant. Interview questions were guided by previous research in this field, as per Brooks (2015) and Moghadam et al. (2017), broadly asking ‘What is your experience of being a mother and student at the same time?’. In agreement with Clark (2000) and following Bruner (1990), we viewed these interviews as an opportunity to collect stories from participants. Topics included motivation for enrolling on a degree programme, the impact of this on family life, support systems, and engagement with technology. The interview

¹ One participant had recently completed a PhD, but was keen to speak to us about her experiences and so was included in the sample

schedule can be seen in the Appendix.

4.4. Analyses

Data were imported into QSR International NVivo Pro 12 software, and we adopted a reflexive thematic analysis approach, following Braun and Clarke (2006, 2020). Analysis comprised three phases, with the three authors engaged in the analysis at different timepoints. First, the lead author coded all data independently, identifying many ‘clusters’ of interest and documenting these digitally on NVivo. Second, they shared this data with the second author, for review. The second author corroborated the way the first author had grouped these ideas and provided critical feedback. Third, all three authors sat down with printout copies of the data, and the list of initial groupings. The co-authors took guidance from the first author about the prominence of these groupings and discussed the best way to present them in a meaningful way. This approach allowed all authors to discuss their interpretation of the data and contribute about the best way to present the findings. The lead author oversaw and refined the analysis procedure throughout.

4.5. Reflexive statement

We emphasise here that subjectivity was not removed, but incorporated via contextualised analysis (Braun and Clarke, 2013). Any meaning-making in qualitative research is context-bound, positioned, and situated. Thus, we recognise that we were active agents in the research process and any outcomes are the result of collaboration between participants and ourselves. We recognise the importance of our experiences in shaping this work, and believe that the first author having a young child, as well as the co-author writing her PhD thesis at the time of crafting this paper led us to a more empathetic lens when working with participants and analysing data. Our different perspectives complemented one another and allowed for a more insightful interpretation of the data.

5. Results

Our aim was to discover how technology influenced the work-family border for student mothers. From previous work, we know that technology adoption by parents is commonplace, and can assist in parenting as well as academic contexts. We approach this work with the undeniable truth that the lives of student mothers are, at times, very hard. The

narrative from participants was one of coping, and discussions focused on ways that certain habits and routines helped keep their student and parenting lives ‘on track’, with some instances where technological intervention made things more challenging.

Earlier we noted that Estes (2011, p.198) observed student parents “are expected to be bad parents, bad students, or both”. Participants often felt that to be ‘good enough’ in one role or the other would require that they compartmentalise being a student or parent, and recognised that they needed more flexibility than other students in choosing where and when to study. In consideration of this framing, we discuss our findings in terms of three key issues in border maintenance: (1) *the need for flexibility, particularly in relation to scheduling and working remotely* (Section 5.1); (2) *the need for role segmentation- to be able to immerse themselves uninterrupted in the student or parent role* (Section 5.2); (3) *the need to blend boundaries, removing of borders and blurring between the two domains* (Section 5.3). We discuss these three issues below in relation to the twin goals of ‘trying to be a good enough student’ and ‘trying to be a good enough parent’ and we pay particular attention to the technologies that support flexibility, role segmentation and blending, to achieve these goals. In Fig. 1 we have modified Clark’s representation of the work-family border, providing a snapshot of some key aspects of our findings in relation to the student, family, or border contexts.

5.1. Flexibility in student and parent lives

In Lim et al’s (2017) study of undergraduate students, many would work from home or use university spaces, such as the library, for both study and social purposes. For our student mothers, homes were set up as flexible ‘work’ spaces, in part because of prohibitive travel time (some participants lived over an hour’s drive away from campus). Working from home was facilitated by lecture recording software and file-sharing services such as Panopto and OneDrive, which meant that students could make the relatively seamless transition from working from university to working from home.

The way that I used to have to save files and access my data was cumbersome before, but now that our computers at the university have all been updated to Windows 10, now it’s a much more seamless process and it makes me feel so much more confident that I can work from both places (Jenny).

Many participants said they also held meetings via technology as this removed the need for them to travel into university. For example, participants reported holding meetings via telephone, FaceTime, and

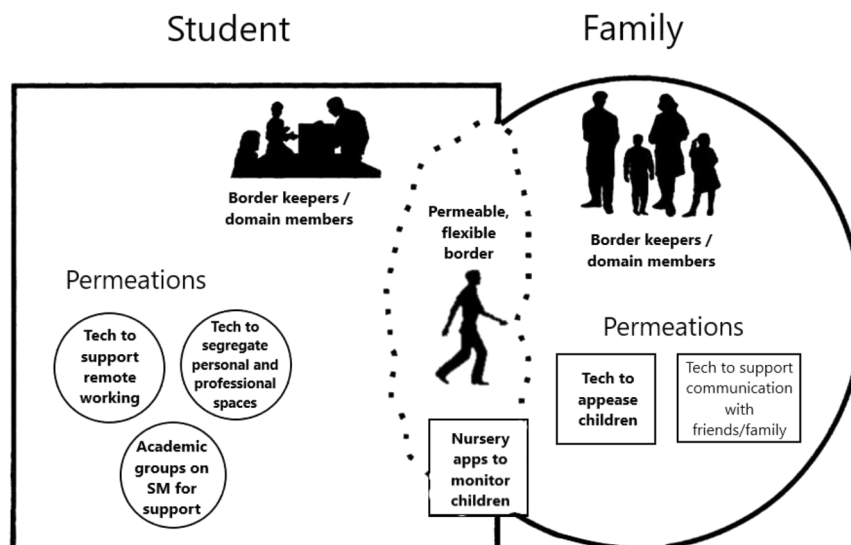


Fig. 1. Clark’s home/work division, amended.

Skype.

She said, "If we need to do our meetings over the phone, or something like that, we can do that as well, if we need to," so that's really good because I'm trying to think how I'd do that. If it's during the day, I'd need to go in, speak to them about my dissertation. It'd be good if I can do some of it over the phone and that, so that's really good (Naomi).

Webinars that offered physical and temporal flexibility were also considered a valuable resource, allowing student mothers the chance to work when and where it most suited them.

Talking of that, webinars, all that kind of stuff, because I can do that from home. Some of them are pre-recorded, so you can log in and look at it any time. The other ones, you just have to make sure that you're in the right place at the right time with a computer. So I've used those loads for teaching, especially about my methodology. I've tapped into those loads because I would not have been able to get the childcare coordinated, or the funds, to be able to attend it in person (Julia).

Technologies thus supported a kind of 'inter-spatiality' (Bailey, 2000), whereby lectures and presentations could be 'pulled' when needed to create a better work-family balance (Wajcman et al., 2010). The resulting flexible, individualised time frames allowed academic work to be put aside when family crises erupted (Home, 1998). In the context of Work/Family Border Theory (Clark, 2000), these technologies enabled participants to integrate their work spaces with their family spaces, allowing them to juggle their roles as students and parents. These technologies then generally added to work flexibility without impacting on home time too much. However, students weren't always enthusiastic about the technologies that supported flexible working. In part, this was because they didn't always have the time needed to understand what technology was available to them, nor to learn how to use the technology.

There's probably a lot more that I could do and use, but it's a bit like when you start the course, there'll be all these things to start using but it's finding them and finding the time to work out how to use them. It's just impossible (Sandra).

Student mothers are said to be time-poor (Augustine et al., 2018; Sallee, 2015) and for some participants, this 'time squeeze' was exacerbated by a perceived lack of support from universities.

In our department we have an induction meeting or, what is it called, an orientation, but they don't go over how any of the technology works and how you could work from home and how things do sync up and how you can get an app on your phone. It's just completely absent (Jenny).

This was an understandably frustrating experience for participants and some suggested simple changes that could improve matters. For example, Jenny said that universities could provide students with information about technological resources on entry to their courses.

I think it would be helpful to kind of almost just get an old-fashioned list of what apps and technology might be available when you first start, especially as a mum. If there is some kind of way to support parents like, 'Hey, there's this really great Facebook group' (Jenny).

In addition, it wasn't always easy for students to access their work outside of university, sometimes because of home internet connectivity, or files not synchronising correctly between home and university computers.

It's all on my laptop. Everything's based on the laptop. There was a day that I didn't have any internet access and that was just like, 'Oh no. What do you do now?' I don't think you realise how much you rely on these things until you don't have them (Sandra).

But then what happened is none of my files had saved properly or synced between my home computer and my work computer...I literally had a day that was almost wasted because even when I signed in online, I was not able to access the work that I had done here at home (Jenny).

Failures such as these often resulted in valuable time being wasted and served to exacerbate the sense of *not being a good enough student* in comparison to others who were less dependent upon the kinds of flexible delivery promised by technology.

The notion of flexibility when applied to the parenting role was rather different and drew upon the nature of family roles and responsibilities. Participants discussed power imbalances between themselves and their partners, describing roles they would often be solely responsible for, on behalf of the family. Whilst some participants offered up information about how parental responsibilities were divided between both caregivers, mothers were far more likely to be the ones to manage digital systems, log activities, record appointments, and generally keep the family in check. Below, Kara explains how she tried unsuccessfully to get her partner to adopt to these digital systems.

I think something like Wunderlist would have been really good if my partner would have taken to it, but he didn't. I was creating to-do lists for both of us, and he wasn't ticking anything off. So that was it (Kara).

Many participants expressed a desire to go to conferences, which is commonplace for those studying for a PhD, but lacked the flexibility that would make this possible. Karina explains how she thinks differently around childcare if she wants to go away.

My husband works an hour and a half from here, so whenever he's the primary carer, he has to take our son to nursery, he basically has to either go late to work or come earlier from work and it's just really hard to organise that. [...] I found an amazing summer school for two weeks in Amsterdam and I'm just, like, 'No, I can't do it' (Karina).

We heard no discussion around more 'flexible' forms of conference attendance (e.g. with an offer of childcare or with remote attendance), although we should note here that, since the Covid-19 pandemic, this has changed completely, with remote attendance now commonplace. This largely removes the 'child-conference conundrum' (Girouard et al., 2020), but also makes access to seamless technology to attend these kinds of virtual events even more important.

5.2. Role segmentation and 'keeping on track'

Participants reported using a variety of technologies to support role separation. Many of these were digital scheduling systems used to help organise time, reinforce boundaries and reduce permeability between roles, although other systems were used to allow for the creation of 'quality time' in one role or another. These were sometimes simple scheduling systems (such as Google calendars or Evernote reminders) that acted to reduce the cognitive load associated with juggling different timetables, but that also worked to reinforce boundaries and help to create an immersion in one role or the other. For example, Karina described using the 'Pomodoro app' to support periods of intense working (for 25 min) followed by a five-minute break, so as to minimise interruptions and enhance concentration on the primary task (Ruensuk, 2016).

I started using apps more, like productivity apps, and that's all coming from when we go for these doctoral college workshops, then they tell us, 'Oh, maybe you can try the Pomodoro app or this app,' and then I'm researching how to do your PhD well, and different blogs, and then they suggest an app or something. So, that's why I'm using apps more (Karina).

Jenny used a range of separate digital notebooks for academic (writing literature reviews, attending conferences) and family

(organising Christmas) tasks. The way she managed boundaries was to organise both work and home life on a 'project' basis (see Fig. 2). This was a form of 'compartmentalisation' (Martinez et al., 2013) that was more about labelling than segregation per se.

I went through a phase of desperately trying to find apps/websites/programmes to help me be more organised from a life and project management perspective. I tried Monday, Evernote, and Trello. I actually used Trello for a while but in the end, I didn't like the format and just felt it wasn't adding much value. It was interesting though, as I created projects for both studies and personal life such as 'Christmas 2018' (Jenny).

Within the home, our participants relied heavily upon digital systems to manage daily routines, and keep track of themselves, their children, and partners. Digital calendars were often used to direct family to the activities that were coming up and we see an attempt at careful role segregation here.

I've got one that's called 'uni' and there's one that's called '[husband's] work' because, sometimes, he has to work weekends and stuff, so we have to plan that in. All of [child's] are in there, whether it's his after-school clubs or just school holidays in there as well, so I can keep track of when he's actually off. There's been many a time where I'm like, 'Oh, he's back on Monday' and then I'm like, 'Oh no, it's an Inset day' (Samantha).

Here, not only does Samantha take on the responsibility of segmenting activities for her son, but she also keeps a watch on her husband's schedule- the mental load of 'keeping track' being facilitated by technology. Neustaedter et al. (2009) have written extensively on the use of digital and paper calendars in the family setting- citing a lacking availability (a calendar hanging on the kitchen fridge is no use when at work) of paper calendars as a reason many families opt for digital. Julia explains.

I have a calendar for school holidays, I have a calendar for after school clubs, I have a calendar for me, a calendar for my husband, all different colours. I can bring the Google calendar up and I can look at it and know who is supposed to be where at what time and why. Because without that, I was planning too many things into my life without realising that I'd already got a commitment. I tried a paper-based calendar, but you can't take it with you. It's on the wall at home in the kitchen, so it just didn't work. (Julia)

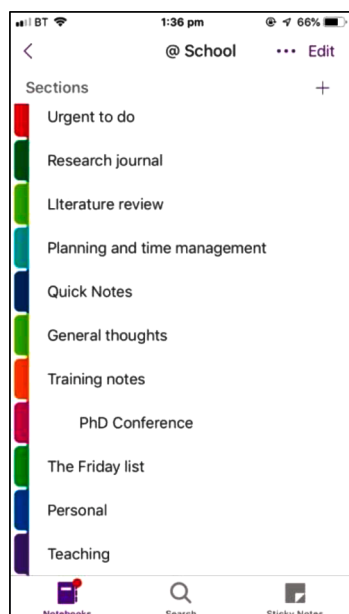


Fig. 2. Jenny's onenote folders.

Other more overt strategies to fully compartmentalise work and family lives were also discussed. For example, Julia adopted a working routine whereby she would only do university work during 'normal' working hours. This extended to Julia's use of technology in which she removed her university email from her mobile phone.

I now have a very strict working routine, and I work in school hours only, and I do not work at weekends. I have removed university email from my telephone so that I cannot know that emails have come through that I need to respond to [...] But I think that has come around through the fact that I completely fell apart (Julia).

The coordination of family events and activities often falls to mothers. Indeed, Neustaedter et al. (2009) found 93% of mothers were the 'primary scheduler'. Julia uses segregated calendars for different family members or roles and our student mothers were wholly positive about using digital calendars to help to remember and keep track. However, there were instances when student mothers talked about technology failing. The biggest grievance about technology in this family context was sync issues.

So we've got my husband's work calendar, my work calendar and then we have the iCal, or whatever, on our computer and on our phones and things get missed between those systems because they're not all synced together (Jenny).

Interestingly, social media was often used as a planning tool - to create a dialogue with other parents to follow what is happening at school and after-school clubs. Abigail described how many things she is required to remember in this context.

Well, Book Day, this day, that day, pocket money for this, tuck shop day, school trip day. Got to have your money in for here. They're not doing PE this day. Don't send trainers in. Do send trainers in. So, that is chaotic (Abigail).

Student mothers frequently used WhatsApp or Facebook groups to share information. Our participants talked of the usefulness of group chats with other mothers, who would keep them up to date with relevant and timely school activities.

The school year has got a Facebook group, so I use that a lot. And people come on, 'When is the school nativity? What are the school lunches today?' or things like that. So, I use that a lot (Sandra).

There is one for the mums of the boys. So, it's sort of categorised if you like into useful groups. And also, there is a class one and there is a year one which are really useful because there is so much that goes on in school (Abigail).

Nouwens et al. (2017) write about these digital channels as 'idiosyncratic communication places' (p.727), suggesting different digital spaces have varying membership rules, emotional connotations, and purposes. Our findings reflect those of Lim et al. (2017) who described the way undergraduate students used distinct social media channels to control their availability to friends, family, colleagues, and faculty. We too note that our student mothers created separate social media channels for certain kinds of information exchange, with some of these social spaces providing an additional sense of connectedness and belonging to specific communities (Church and De Oliveira, 2013; Dixon, 2018).

5.3. Boundary blending and support systems

Clark includes 'blending' as a core tenet of her theory. As the name suggests, this occurs when flexibility between borders is high. The area around the border is no longer exclusive, but creates 'a borderland which cannot be exclusively called either domain' (work or home) (Clark, 2000, p.757). Certain technologies helped participants blend their worlds. Student mothers described how technology made them worry less about

their child's wellbeing. They spoke of platforms which allowed them to receive reminders of how their child was doing, reporting on milestones or things they enjoyed while they were separated.

Our nursery has an app for parents, where they put all the photos and what kids were doing, and all the information, so I find that one quite useful. I really like that, in the middle of the day, I can just check what he's doing (Karina).

Many early years childcare providers as well as schools have adopted these kinds of systems to keep parents notified. We got a sense from our interviews that these systems were well received by mothers, providing peace of mind when they are preoccupied with study away from their children. Lim (2016) talks about these kinds of notification systems in a negative way, suggesting 'the mobile-connected parent is on permanent standby' to receive communication from their children, or the organisations in which care they are placed, indicating this standby mode can add to the feeling of responsibility a parent feels even when not in the presence of their children. We did not find our participants expressed these sentiments, particularly for those who had very young children – a reminder of their contentment at nursery was a welcome distraction.

Our parents experienced guilt about working in the home when children were present. Kara (below) describes her 'ideal' situation as only working when the children are not present, something that touches on a phenomenon known as 'WIF-guilt' (work interfering with family guilt) (Borelli et al., 2017). WIF-guilt is often triggered by the need to use technology (such as the television) to gain 'uninterrupted work time' and indeed, our student mothers expressed regret, anxiety and guilt about using 'screen time' to keep the children quiet, reporting that often, the only way to get anything done at home was to allow children access to TV, computers, tablets, or mobile phones.

I try to only work when the kids are not here, but then obviously there are deadlines. Then sometimes I have to work in the evenings when my partner gets home. I've been guilty of turning on the television as well, CBeebies, and sneakily written a few articles. That's happened as well (Kara).

In addition to children engaging with television to keep them occupied, they were also appeased with phone or video calls. Jenny speaks about how she and her husband co-parent; she is physically present with the children, whilst her husband is often connected via FaceTime. Using technology, she hands over responsibility to her partner, who can look after the children (digitally) for a short time.

I mean, to be honest, sometimes I'll give my kids the phone and, 'Look, here's Daddy, he's on FaceTime,' let them mess about for like an hour while I send a few emails or something. It's sort of like akin to them watching TV or something. It's like, 'Here look at the screen and let your dad be responsible for you a little while, even if it's remotely, while I do some work' (Jenny).

We also find that student mothers struggle with the hypocrisy of limiting screen time for their children, whilst using it themselves.

So there's a weird balance, because I find myself on my phone checking out a post from one of the doctoral parents group members or checking email but then, equally, I'm like, 'No, you can't play on the iPad, you play with physical things.' So it's like that constant sort of narrative or script going on in my head about like, 'Okay, well this is a useful resource for me, why am I denying my children that same access?' (Jenny).

There is a sense of student mothers struggling to understand what might constitute a reasonable reliance on digital technology, both for themselves and for their children. Hiniker et al. (2015) explored this in terms of the social pressures on parents to stop relying on their mobile phones, finding that even in playgrounds, parents experienced guilt whilst using their phones to conduct a variety of tasks, and expressed a desire to reduce their phone usage- perhaps in recognition of that fact

that they are somehow less 'present' with their children at such times. This issue has recently been described as smartphones heralding 'the death of proximity', in the sense that the phone becomes a distinct additional domestic environment that excludes those physically present in the real home (Miller et al., 2021). Our parents recognised the kinds of distance created by smartphones for both themselves and their children, accepting that younger children start video communication at a progressively younger age (Tarasuik and Kaufman, 2017). These practises of using technology to distract or appease speaks to the notion of a practical gain (being able to get on with work) versus an emotional loss (guilt at using technology to keep children quiet, a sense of missing out on family time).

Lastly, we found that online support groups, namely social media groups, were important in reinforcing role identity as both student and parent. For example, many student mothers said they were members of Facebook groups for PhD students, Women in Academia Social Network (WIASN), and academic parents. These groups blurred the boundaries of being a student and a mother, with space allocated to talk about either role, but often both.

There's the PhD and early career parent group on Facebook and I have found that to be one of the most helpful resources yet. Both from a kind of like just, 'Oh my gosh, there are others out there like me,' which I didn't get that sense of community at my own university. So just seeing posts from others about managing studying and family has just been amazing (Jenny).

Caitlyn also recognises a duality to the role of social media for student mothers providing a blurred space to ask about both academic and motherhood issues.

In the PhD Parents Group I will post something about being nervous about an interview or school-related things. People often will post things about my child was being a dick and won't nap, or I'm going to a conference, what do I do about pumping milk? So it is a space where- it does have that duality to it (Caitlin).

Indeed, most participants were recruited from WIASN which comprises 11,000+ academics, yet discussions also include promotions, morning sickness, and technology guidance. For participants, these sorts of online groups helped foster a sense of community, which was sometimes absent from their university experience. Unfortunately, a lack of a sense of community and feelings of isolation are common among post-graduate students (Lovitts, 2001). In particular, student mothers report mental pressures and loneliness (Kreischer, 2017; Taukeni, 2014). For our participants, social media was a valuable resource that helped them overcome some of these issues.

6. Discussion

At the outset, we asked 'Does technology support or erode a work-family border for student mothers?', and 'How does the permeability of these borders impact on student mothers' lives?'. We presented qualitative data from 11 in-depth interviews with student mothers based in UK HE institutions and framed our results around how technology use helped or hindered student mothers' attempts to 'be good enough' in both their roles. We described the ways that digital technologies were considered helpful in terms of offering flexibility, or unhelpful in terms of eroding role boundaries and gave examples where they offered some support for 'blending' both roles. We presented some technological difficulties to being an effective parent or academic, which we explore further below. Our participants set the scene for this work, explaining that the life of a student mother is, at times, very hard, and our findings speak very specifically to a student mother population. At times in the interviews, participants would speak about their experiences of studying as completely different to those of 'traditional' students in their department with no caring responsibilities. We repeatedly encountered

a narrative of postgraduate study as more akin to a job for our participants. In addition, we recognise six participants also held part-time paid jobs (Abigail; Kara; Naomi; Rose; Sadie; Sandra). By exploring these multiple, demanding roles, we unpick how technology is utilised within work-family dynamics.

We chose to focus on Clark's Work-Family Border Theory, which suggests we negotiate between two worlds, being proactive about how we engage in both. This was a useful way to think about the experiences of student mothers. We found clear evidence of them implementing work-family borders in our data, for example defining when and where domain-relevant behaviours took place (e.g., defined working hours, designated working spaces), setting aside time to work on university tasks at home, limiting studying hours so as not to interfere with family life, and using separate digital calendars to maintain borders. When these borders crumbled, often because of inconvenience or system inflexibility, participants adopted strategies within these limits, such as colour-coding, to differentiate the different roles or 'worlds' (see Julia's discussion of calendars). We see a clear desire to reduce spillover from home into work in these divisions.

Our participants also naturally experienced a blurring between home and academic roles, in a time when context collapse (collapsing multiple audiences into single contexts online) (Marwick and Boyd, 2010) may be difficult to avoid, although an alternative interpretation here, in the light of new work by Miller et al. (2021), is not that two contexts become blurred, but that parents become temporarily 'absent' in the physical context when the digital context dominates. Online support groups were called on to vent about student and family life and participants used Facebook to express exasperation about children's eating habits as well as academic interviews. Home was a place for blurred activity, particularly with looming deadlines or e-mails to send. At such times children would be given access to iPads or TV programmes so student mothers could work. Participants spoke of difficulties with travel eating into precious work time, therefore working at home was preferable, despite the parenting challenges of children being there too. So, we see student mothers tailoring their use of different technologies to suit their role in each context, and at times this worked well, such as watching Panopto videos at home whilst kids are at school.

So reflecting on our research questions, we find that technology *can* support a work-family border for student mothers, but that the effort required to manage these borders is at times, frustrating and inconvenient (for example, student mothers setting time aside to work on university tasks at home, only to find the technology failed). The most beneficial technologies were those that offered flexibility, such as Panopto, meaning academic work could be done at home to optimise travel time, for example. In instances where, through necessity, boundaries had to be blurred, we find student mothers felt guilt about the bleeding of work into home life, whilst being grateful that the technologies could allow some respite where needed (using technology to distract children, or monitoring childcare via nursery apps during the working day). We consider the design implications of these technologies in more detail below.

6.1. Design implications

Reflecting on the technologies described, we heard powerful narratives about the ways they supported student mothers with both parental and academic roles. We should think more critically about the ways these systems are used, and how they encourage flexibility or inhibit boundary permeation. In terms of academic roles, university platforms like Panopto allowed participants to engage with coursework, whilst still being able to support their children settling at school. Services such as Google Calendar allowed student mothers to organise their schedules on the go and ensure other family members could be notified of personal appointments. As parents, nursery applications allowed mothers to feel close to their children when separated, and platforms such as FaceTime enabled other carers to entertain children whilst mothers dealt with

academic tasks. However, we also need to acknowledge the failings of some of the technologies discussed. When there were problems, the consequences could be severe. For example, forgetting to update a digital calendar might result in missing a child's school play, or failure to understand IT systems could result in losing hours of work because data hasn't synced between home and work computers.

We feel there is opportunity to make improvements in this context. Bødker and colleagues suggest the need for supporting boundaries when they are productive, and changing boundaries when they seem more appropriate. They explain that flexibility is 'a core issue when dealing with technology for boundaries' (p.311, Bødker et al., 2003), and outline the importance of allowing those who want to use different technology to do so. This enables displays of individuality and flexibility, instead of a 'one tool for one task dogma' (p.317). In Bødker et al.'s work, the boundary dialogue is between employees and their organisation – often a very prescriptive environment, particularly when technologies must comply with security policies. In our context, however, there is little prescription about what kinds of systems our participants should use- allowing more choice and providing associated IT support to enable individuals to choose technologies that suit them would be helpful. A Nuffield report, published by the University of Warwick (Lyonette et al., 2015) recognised some of the difficulties we've described here, noting that, in the UK at least, relatively few universities catered fully for the needs of student mothers and that, ironically, the universities of choice for student mothers tended to offer poorer support. In particular, the authors note that student mothers require greater flexibility, something which is admittedly more difficult to achieve in a physical as opposed to a digital space. A more recent report exploring new ways of working (The Economist Intelligence Unit, 2020) also suggests we should be 'giving people greater flexibility in how, when and where they do their jobs'. Increased control should allow people to define their own schedules more easily- something that was desirable for our participants.

In terms of digital flexibility, explicit training for student parents about how to navigate off campus computing facilities would allow them to confidently balance work and home demands without feeling pressure to travel to campus. Arranging virtual meetings with supervisory teams would reduce the burden on student mothers to arrange childcare- particularly for things like 'keeping in touch' days. A broader consideration of platforms that could be used for academic management (e.g. Google Calendar, instead of Outlook) would enable students to confidently merge their family and student lives, rather than feeling they have to compartmentalise. These kinds of digital interventions would offer all students, not just student mothers, more choice in how they work.

7. Conclusion and future work

We conclude by reflecting on our work and describe where we need to turn our attention to next. We must acknowledge that the student mothers' stories were not trivial. The difficulties facing our participants were real, and the themes reflect not only the nuanced ways they used technologies to cope but speak of a wider impact on well-being and relationships. Technology can provide opportunities to juggle the roles of parent, student, and employee and offers the chance to work in different places and connect to others we would otherwise lose touch with. It often, but not always, gives us the choice of whether to separate or blur our roles and making sure those choices are meaningful would be a step forward in enhancing the boundary-making experiences of women.

Since this research was conducted, we have experienced a global pandemic which, for many, has completely changed life, work and study. We know that students have been adversely affected by events associated with the Covid-19 pandemic (Aristovnik et al., 2020) and we know, too, that more women than men made the transition to home-working, but that for those households where children were present, women became disproportionately burdened with housework

responsibilities during lockdown (Yildirim and Eslen-Ziya, 2021). Boncori writes a touching reflection of her experiences as an academic and mother during the pandemic, highlighting the ambiguous space of “the work-place” (Boncori, 2020). We acknowledge that these kinds of experiences will resonate with our student mothers, and whilst technology may have alleviated some of the struggles of studying at home with young children, the enforced blurring of the two roles will have been extremely difficult.

We recognise some limitations to our work, namely a lack of participant data on socioeconomic status, ethnicity, or marital status, which means we do not yet truly understand these issues for a broader range of women. We also acknowledge that we recruited participants solely from social media, which excludes those who are not part of the kinds of social networks our participants came from. These issues should be addressed in future work. We also need to consider the role of fathers/partners. It is commonplace for parenting literature to describe a father’s role as limited, engaging in significantly less childcare than mothers (Lukoff et al., 2017). In terms of strategies undertaken by parents to navigate work and family roles, we have heard here from student mothers who describe how they must coordinate their partner’s schedules as well as their own to keep the family on track. Work is beginning to explore the ways that men engage with social media in their role as fathers, to access social support (Ammari et al., 2018; Ammari and Schoenebeck, 2015). Our future work will explore the work-life balance of student fathers, as well as perspectives from the partners of student mothers.

CRedit authorship contribution statement

Lisa Thomas: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing – original draft, Writing – review & editing, Project administration. **Catherine V Talbot:** Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Pam Briggs:** Conceptualization, Formal analysis, Writing – review & editing, Supervision, Funding acquisition.

Declaration of Competing Interest

The authors have no competing interests to declare.

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Appendix

Interview schedule

Being a student...

Could you begin by telling me about yourself...

Tell me about how you became a student

Tell me about your course.

How much time do you spend in classes versus personal study?

Previous experience being a student? How does that compare to now?

How do you feel about your studies? Positive/negative?

Support systems in place? What more could be done?

About motherhood...

What is your experience of being a mother and student at the same time?

Could you talk about your home set-up? [who you live with]

What support systems do you have at home?

Do you feel being a student has impacted family life? How?

How do you feel you juggle the two roles?

Do you experience any difficulties? [e.g. how do you manage illness – you or your child- and study?]

Technology use...

How ‘tech savvy’ do you feel?

Can you tell me about any digital resources you use during a typical day? [to help organise...] e.g. paper diary, online diary, online repositories; social media; Blackboard.

- Why do you use each?
- What helps?
- Why?

Do you use these resources in other contexts? E.g. social media for work/family?

What digital equipment do you own/have access to? Why?

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