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'It Depends': Technology Use by Parent and Family Educators in the United States

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Abstract: Using data from a national sample of parent and family educators in the US ($n = 697$), this comparative study examines professionals' practices and technology-related attitudes, skill and workplace conditions. Overall, professionals report positive attitudes about the value of using technology in practice and view themselves as proficient. They most frequently use technologies like the email and document preparation software, and less frequently social media and even virtual reality. Workplace resources vary significantly, educators are not motivated by employer expectations and most report self-training as more valuable than formal sources. Mean comparisons by family educator type validate differences by context. Parenting educators, occasional family educators (e.g., teachers, counselors) and Family Life Educators vary from those in Higher Education/Administration. Those in Higher Education/Administration have more technology resources, report more positive attitudes, are more confident about their skills, and view formal technology training as useful. Conclusions suggest the need for the field of parent and family education to join other educational professions (e.g., licensed classroom teachers) to embrace technology use as a critical competency and advocate for the necessary resources in the preparation and ongoing service training of professionals.

Keywords: technology; parenting education; family education; workplace supports; technology acceptance

1. Introduction

Without a doubt, innovations in information and communications technology (ICT) are redefining families' lives in the 21st century. The rapid introduction of smaller, more mobile, multi-featured devices makes communication with others easier, enables information to be gathered and shared quickly, and for the tasks of daily life to be navigated seamlessly. Access to the Internet is nearly ubiquitous, with a reported 90% of adults worldwide online [1]. Futurists predict that by the year 2025 the Internet will be like electricity, available everywhere [2]. And smartphone ownership is nearly as prevalent. In seven short years, smartphone possession in the United States has risen from 35% in 2011 to 85% in 2018 [1]. Equally exciting, as tools for outreach, learning, tailored instruction and program administration, new information and communications technologies offer efficiencies in parent and family education [3,4]; efficiencies that benefit participants and professionals alike.

Yet the rapid rise of ICT in the last 20 years has also brought new challenges to parent and family education. The popularity of interactive platforms like Facebook and Instagram, and virtual reality applications like Second Life heightens family members' interest in ways that content is delivered [5–8]. At the same time, using these formats raises questions about digital ethics, data security and equitable access to resources [9]. Moreover, despite prevalent access to the Internet and widespread use of social media, parents and family members vary widely in technology attitudes, preferences and skills [8,10,11], suggesting differences in 'digital readiness' to accommodate when integrating technology into instruction [12]. Certainly, the speedy adoption of new technologies generates questions about safety and effectiveness that families bring to professionals. Parents want to

know if a new application is harmful to their children, how to introduce technology safely, and what to expect from devices, applications and access that are unfamiliar to those from earlier generations. Faced with reports of the benefits of technology to learning [13] alongside research that suggests the evils of smartphones (e.g., [14]), parents are confused [8]. In short, advances in the use and comfort with technology means that parent and family educators must have the skills and knowledge to address technology both as a content area of practice (what families want and need to know) and in the delivery of programs (how learning can be facilitated effectively and safely).

Technology integration and the needs of professionals have long been embraced in formal education spheres in the US [13,15]. Teacher preparation scholars call for the acquisition of 'adaptive expertise' to keep up with innovation [16]. Conceptual models such as Mishra and Kohler's TPaCK [17,18] convey mechanisms for the intersection of technology (T) with field content knowledge (CK) and pedagogical practice (P). Integrationist models also attend to the obstacles that challenge educators' technology use by stepping up training and systemic technical support [15,19,20]. Like our formal classroom counterparts, family educators need to be content-ready and armed with adequate technology and adequate technology skills to integrate newer ICT into their practice. Yet it is essential to acknowledge differences in our non-formal education sphere of practice: educational settings in community classroom, content that bridges a variety of applied topics, audiences that range from children to senior citizens [21]. To that end, this study examines technology use and factors that may influence use in among family educators and, because of the diversity of job types and work conditions within the field of family [21,22], it compares the technology use experience and influences across categories of professionals.

2. Empirical and Theoretical Background

Technology Use by Family Education Professionals: A Limited Understanding

To date, research specific to technology use in family education predominantly focuses on the deployment and effectiveness of specific applications or with specific audiences, rather than on the knowledge or skills or needs of practitioners. For example, Nieubower, Fukkink and Hermann [23] and Hall and Bierman [24] compare online programs for parenting interventions and identify particular strengths for practice. Research may focus on the value of a particular format (e.g., social media) to deliver specific content and/or to a specific audience (e.g., nutrition, [25]). Few studies, such as that by Aburime and Uhomoibhi [26], take a global perspective on family educator technology use. Literature reviews or non-empirical literature offers guidance to professionals on use; for example how to create and deliver online education programs [27].

Perhaps the limited research reflects the diversity of family education as a field and the challenges in understanding of technology integration. Unlike our education colleagues in preK–12 settings, family education practice varies in audience and settings and its professionals may hold other duties such as program administration, or work part time [21,22]. Because the deployment of particular devices for learning needs to be tailored to content and instructional objectives [17,28,29] the construct of technology 'use' in family education may vary widely by context. As a result, our limited research to date and exceptionally variable profession makes it challenging to adequately characterize use and identify standards of practice for family education.

3. Motivations and Influences on Use

Over the past decade, the author has advocated for a perspective that elucidates family educator technology use as reflective of influences in the professional's context. A Unified Theory of Acceptance and Use of Technology (UTAUT [30]) identifies attitudinal and contextual constructs that motivate use including the perception of success (e.g., the technology is useful to the purpose), of effort (e.g., the technology is easy to use), influence from the social context (e.g., encouragement of others), and facilitating conditions (e.g., the availability of training). Personal factors that may condition use

include age and previous experience with technology. The author's own application of the Technology Acceptance Model (a forerunner of the UTAUT) with parenting educators identified attitudes accepting of technology as predictive of use [31], and subjective norms and facilitating conditions as having indirect influence on attitudes [32].

Educator technology research questions the degree to which attitudes predict use, relative to more contextual influences. Papanastasiou and Angeli [33] demonstrated that technology use by educators is not a separate act but one shaped by exposure to the workplace culture. That workplace culture includes the perception of resources for using technology in practice, or the workplace infrastructure, and felt value and encouragement by others with whom the educator works. Ertmer's [34] perspective supports extrinsic factors such as training, access to devices and organizational climate operate as 'first order' influences on technology use, and views attitudes as second order influence on use. With research on early childhood educators, Blackwell and authors [35] supported this perspective and determined that educators' attitudes toward technology were more profoundly influenced by the availability and quality of support. Jointly these perspectives support the role of context as a significant influence on technology use, and use likely conditioned by attitudes accepting of innovation in education.

An aspect of perceived usefulness is the focus on *pedagogical* value of technology: motivations for use related to learner expectations and learning outcomes [29]. Technology integration models that specify applications of tool to task (e.g., using software that stimulates creativity, provides information clearly, facilitate analytical thinking, etc., [36]) highlight learner and instructional motivations as separate from workplace conditions. Peffer, Bodzin and Smith [37] identified that non-formal educators' interest in the adoption of new technologies was shaped by the combination of employer and peer expectations, workplace culture and an interest in accommodating the learner. Yet, as O'Neill, Zumwalt and Bechman [38] suggest, adopting a technology for learner appeal (in their case, social media for financial education) can be frustrating without adequate workplace training and guidance.

Although the author's previous research has helped identify the value of attitudinal and context factors in parent and family educators' technology integration, it is limited in scope in several ways. Samples have been specific to parenting educators or small in size and representation. Previous work has examined workplace-related and attitudinal influences but not pedagogical motivations for use. Given the rate of change in the availability and access of technology and resulting effects on expectations by learners and the workplace, it is important that our research stays current to incorporates newer devices and applications. To that end this study explores use and a range of influences in a nationally representative sample of family educators in the United States. Because of the diversity within the field, it compares technology experiences by type of education practitioner.

While largely exploratory given the limited knowledge of our field's technology practices to date, the study adheres to an abductive approach in choosing to compare across professional groups [39]. The abductive approach takes a systematic step in exploring the interplay between theory and observable action. It is guided by a framework of understanding (in this case, that context factors condition the technology attitudes and use of family educators) yet anticipates modification over time with continued exploration of the phenomenon specific to the field of family education. Indeed, the interrelatedness of factors that influence the deployment of specific technologies with specific audiences by a field as varied as family education will require non-linear and continuous exploration. For the current study, the hypotheses are driven by anticipated differences in the contexts of family educators by type. Previous study of parenting educators (e.g., [40,41]) and of family life educators [22] reveal that those who work predominantly as family educators work with adult audiences, and in community-based programs. Those who work more occasionally in family education represent a wider range of work settings and audiences and their occasional educator status would seem to motivate their use of technologies for education differently. Those who work in higher education or in administration have specific setting and audience differences to the other groups that would seem to condition use (for example, exposure to learning management systems to accommodate interest in online courses). Therefore, it is hypothesized that, when comparing educators who work primarily

as parenting educators or as family life educators, with those whose work in family education is more occasional and with those who work primarily in higher education settings or in administration, differences will exist in the frequencies of types of technologies used, that motivations for use will vary, as will perceived skills and attitudes toward technology, and that there will be differences in perceived supports and barriers to technology use.

4. Methods

Survey and Participants

The project was a collaboration between the author, the National Council on Family Relations and the University of Wisconsin-Extension. Data was gathered through an online survey. In part, the survey included instruments used in research on technology integration practice in family educational contexts previously adapted and tested for validity and reliability by the author [31,32,40]. Items added for this study related to learner populations identified for family life educators [22], motivations for use, proficiency [36,37] barriers to use [19,33] and technology-related training [42]. These were identified from relevant education technology literature, adapted in wording to align with family life education practice by the collaborative research team and tested for construct validity with an advisory group of professional family educators. The full survey was piloted for task difficulty, clarity and time with a representative sample of the study population ($n = 20$), then revised based on feedback.

Family education professionals in the United States were invited to take the survey in November, 2016. The survey was distributed by email invitations sent to members of several professional lists. NCFR is a professional association whose membership includes researchers, university faculty, education practitioners and couple and family therapists. NCFR offered membership lists most appropriate to those identifying as family educators. This included 12 affiliate regional councils of NCFR, those who are active or lapsed Certified Family Life Educators (CFLE), and members of the Education and Enrichment section ($n = 7362$). NCFR oversees the CFLE, which confers credentials on professionals who demonstrate competence in family education methodology and content knowledge. The survey was also sent to licensed parenting educators in Minnesota ($n = 1068$), and to Extension family educators in Wisconsin ($n = 62$). Minnesota maintains the only state sanctioned teacher's license in parenting education in the US, required for those teaching in school-district Early Childhood Family Education programs (ECFE.org). Cooperative Extension is a program sponsored by the United States Department of Agriculture delivering research-based education in the community in cooperation with state-funded research universities (https://nifa.usda.gov/extension). For this project the University of Wisconsin-Extension provided sampling access to their regional and county educators who work in areas of family finance, nutrition and parenting ($n = 60$). The combination of sampling sources offered access to a wide array of professionals who identify as family educators. Response rates averaged 36.7% across the lists, typical of online surveys given to targeted and diverse groups [43]. Complete data on study variables was obtained from 1288 individuals, with 697 responding yes to "Are you currently practicing as a family educator (paid or unpaid)?"

Demographics of the sample are provided in Table 1. Based on previous study of these sampling populations [22,31,40], the sample was nationally or state-specifically representative of family education professionals.

Table 1. Sample demographics ($N = 697$).

Demographics		
	Mean	**SD**
Age	48.78	12.68
Years of Experience	14.04	11.12
	N	%

<div align="center">**Table 1.** *Cont.*</div>

Demographics		
	Mean	**SD**
Gender		
Female	527	87.4
Male	60	10.0
Decline to Answer	14	2.3
Other	2	0.3
Location		
Inside U.S.	589	97.7
Outside U.S.	14	2.3
Education		
Less than Bachelors Degree	4	0.7
Bachelor's Degree	169	28.2
Master's Degree	270	44.0
Advanced Certificate	28	4.7
Doctorate Degree or Higher	129	21.5
Job type		
Parenting Educators	242	35.7
Family Life Educators	122	18.0
Occasional Family Educators	157	23.2
Higher Education/Administration	157	23.2
Work setting		
Government/ School District	350	53.1
Non-Profit	230	34.9
For Profit	50	7.6
Uncertain	29	4.4
Learner's Age		
Adolescents (Ages 13–18)	50	7.6
Young Adults (Ages 19–30)	252	38.2
Adults (Ages 31–64)	326	49.5
Older Adults (Ages 65–85)	11	1.7
Don't Work with Learners	20	3.0
Learner's Education		
Primarily High School or Less	133	20.2
Primarily Some College or More	189	28.7
College or Post Graduate	78	11.8
My Learners are at Mixed Education Levels	259	39.3

5. Measures and Analysis

Demographic variables included age (numeric), education, years of practice and gender. Job classification (16 categories), structure of the organization, learner age and learner education were adopted from the 2014 Job Analysis study of Family Education professionals (Schroeder Measurement Technologies). Technology use was measured for nine devices or applications representing type (e.g., device, software) and function (e.g., communication, document preparation, instruction) likely in a range of family education settings and validated by collaborators. Frequency response choice items of never (1), occasionally (2), often (3) were self-defined (i.e., the respondent was not coached how to define what 'often' meant) and included 'no access.' Similar measurement response choices on technology use are characteristic of other educator surveys (e.g., [36,42]). Provision of technology by self or by employer was assessed for the same 9 items (no/yes) [33]. Counts by employer and self-provision were

constructed from the responses. Proficiency was a single item rating (unfamiliar = 1 to expert = 6, [36]). Motivations for use included 9 items representing pedagogical (e.g., learning outcomes, learner expectations), workplace, peer and personal dimensions assessed as not at all (1), somewhat (2), and a great deal (3) [37]. Six items of technology knowledge or skills [33], five items assessing Technology Acceptance Attitudes [44] and 10 items assessed perceived workplace supports [43]. All three constructs were measured on a 5-point scale (strongly disagree = 1 to strongly agree = 5). Twelve items assessed perceived workplace barriers as not a barrier (1) to extreme barrier (4) [45]. Training and preparation to use technology was assessed in four contexts: undergraduate program, professional development, staff training, and self (N/A = 0, not at all = 1 to a great extent = 4) [42]. Single items identified if continuing training was required to maintain a credential they possess (no/yes), and if technology is a required element of continued training (no/yes/unknown). Descriptive analysis and measures of central tendency were run for all variables.

Four job groups were constructed based on sampling and representations of the nature of the family educator profession and contexts and conditions of work [21,22]. Licensed Parenting Educators (PE) from Minnesota were the largest job subgroup (35.7%, Table 1). Like parenting educators, Family Life Educators (FLE, 18%) are field professionals' whose predominant practice is providing education about family content. Yet while some may be CLFEs, they aren't necessarily licensed teachers. Respondents in this group indicated 'family life educator' or extension educators as their job classification. Occasional Family Educators (OFE) and those in higher education/administration (HE/A) represented 23.3% of the sample each. OFE is a category that combined those identifying as preK–12 teachers, clergy, couple/family counselor, medical professional, psychologists, social workers, or education specialists in the job classification. In previous family educator research, these individuals indicated doing family education as portion of their direct service work with families [22]. The HE/A subcategory included those who identified as academic directors/administrators, program director/administrator, or university/college faculty. Comparisons of variables by job category were tested for most variables through analysis of variance (ANOVA, one-way test of means). Post-hoc analysis of group means was tested using Tukey's HSD to determine significant differences. In the case of demographic variables, and training preferences, job group differences were tested by cross tabulation.

6. Results

6.1. Demographics and Job Category Comparisons

Sample demographics are listed in Table 1. The full sample mean age was 48.8 years, and reported an average of 14 years of work (range 0–50). Places of work predominantly represented government organizations and school districts and non-profits. Educators work mostly with young adult or adult learners, and with a diversity of education levels. Not shown in the table, most worked in the US (97%) and identified as women (87.4%).

Across subgroups, differences occurred by education (χ^2 = 200.35, df = 12, p < 0.01), work setting (χ^2 = 86.07, df = 9, p < 0.01 (learners age (χ^2 = 134.16, df = 12, p < 0.01) and learners' education level (χ^2 = 89.01, df = 9, p < 0.01). PE and OFE were more likely to hold Bachelor's degrees; FLE were more likely to hold Masters degrees; and HE/A were more likely to hold PhDs. With regard to employment, PE and FLE were more likely to work with mixed ages; FLE also reported less time working with Young Adults. OFE were more likely to work with adolescents and those with a high school education. HE/A were more likely to work with young adults, and those with college or post-college education. PE were more likely to work in school districts, and OFE were more likely to work in non-profit or for-profit agencies.

6.2. Descriptive Analysis and Differences by Practice Groups

6.2.1. Technology Use and Access

Table 2 describes technology use frequencies for those reporting access. Reports of 'no access' were relatively low, particularly for Internet, email, Word and Excel software (0% or <1%) and blogs, social media, texting, shared drives, photo editing (2%–7%). Learning management systems (19.6%) and Second Life (virtual reality, 28.5%) presented issues with access for the highest numbers. The Internet, email and preparing documents in Word were more frequently used by most (83.8% or more reporting use 'often'). Social networking, blogging, texting and using presentation software like PowerPoints were reported by more than half as sometimes or often. Very limited use (with the majority reporting 'never' or 'rarely' use) was indicated for online virtual reality (e.g., Second Life), learning management systems (e.g., Moodle, Blackboard), and photo editing software. Technologies supplied by employers averaged 3.16 (standard deviation (SD) = 1.76, range 0–9). Those employer-provided by more than half of the sample were MS Office Suite (67.6%) or laptop (54.1%). Approximately one third reported employer provided online learning platform (31.9%), tablet (30.6%) or video software (24.2%) On average participants reported that they supplied 2.22 technologies (SD = 1.64, range 0–8); with smart phones (70.4%) or computers/laptops (38.7%) most frequently identified. Approximately one quarter reported providing their own tablet (28.4%), MS Office (26.3%) or video software (22.7%).

Table 2. Frequency of use of types of technology (N = 697)

	Overall Mean (SD)	PE (*n* = 242)	FLE (*n* = 122)	OFE (*n* = 157)	HEd/A (*n* = 157)	F
Word	3.79 (0.55)	3.72 (0.64)	3.83 (0.45)	3.71 (0.61)	3.92 (0.34)	5.21 **a,d
Excel	2.74 (1.01)	2.33 (0.97)	3.03 (0.90)	2.73 (1.01)	3.20 (0.84)	29.99 ***a,b,c,d
Photoshop	2.25 (1.11)	1.99 (1.13)	2.51 (1.00)	2.29 (1.07)	2.42 (1.12)	7.78 ***a,c
PowerPoint	3.23 (0.95)	2.91 (1.09)	3.56 (0.76)	3.04 (0.90)	3.68 (0.61)	29.43 ***a,c,d,e
Second Life	1.09 (0.97)	0.91 (0.89)	1.00 (0.84)	1.28 (1.07)	1.21 (1.03)	5.33 **b,c
GoogleDrive/Dropbox	3.00 (1.16)	2.88 (1.25)	3.18 (1.05)	2.80 (1.23)	3.20 (0.99)	4.61 **c,d
Internet	3.94 (0.27)	3.95 (0.22)	3.94 (0.28)	3.89 (0.40)	3.97 (0.18)	2.33
Email	3.91 (0.36)	3.92 (0.32)	3.95 (0.25)	3.81 (0.52)	3.95 (0.30)	4.76 **b,d,e
Blogs	2.32 (1.13)	2.37 (1.12)	2.46 (1.15)	2.23 (1.10)	2.23 (1.12)	1.29
Social Networking	2.69 (1.19)	2.72 (1.19)	2.93 (1.12)	2.46 (1.27)	2.62 (1.14)	3.38 *e
Texting	2.93 (1.13)	2.86 (1.13)	3.22 (0.96)	3.03 (1.17)	2.69 (1.17)	5.28 **a,f
Learning Mgmt System	1.76 (1.35)	1.30 (1.14)	1.70 (1.25)	1.74 (1.28)	2.50 (1.45)	29.96 ***a,b,c,f

Note: * $p < 0.5$, ** $p < 0.1$, *** $p < 0.01$; PE = parenting educator, FLE = family life educator, OFE = occasional family educators, HEd/A = Higher ed/administration;1 = never, 2 = rarely, 3 = sometimes, 4 = often; [a] = significant difference between PE and FLE, [b] = significant difference between PE and OFE, [c] = significant difference between PE and HEd, [d] = significant difference between OFE and HEd, [e] = significant difference between OFE and FLE, [f] = significant difference between FLE and HEd.

6.2.2. Proficiency and Abilities

The majority of educators rated themselves as average (43.2%) or advanced (31.5%) proficiency. Small proportions rated themselves as expert (6.9%), beginners (9.8) or feeling unfamiliar (8.6%). Given a list of skills, most (98%) agreed or strongly agreed that they could search for instructional information on the internet (M = 4.58, SD = 0.58), and use email for communication (M = 4.66, SD = 0.56). Fewer agreed/strongly agreed with having ability with using social media for outreach (65.1%, M = 3.75, SD = 1.03), knowing copyright online (60.5%, M = 3.66, SD = 0.94) and designing teaching activities with technology (55.3%, M = 3.41, SD = 1.01).

6.2.3. Acceptance Attitudes and Motivations for Technology Use

Mean scores for technology acceptance attitude items ranged from 3.24 (SD = 1.06, "It is difficult to stop once I start" reverse coded) to 4.08 (SD = 0.77, "I like technology"), indicating generally positive attitudes. Other items included "technology makes work interesting" (M = 3.99, SD = 0.80),

"technology work is fun" (M = 3.82, SD = 0.87) and "I look forward to using technology" (M = 3.67, SD = 0.90). Table 3 provides mean values for reasons for using technology in family education work. Making learning more interesting, the ability to organize resources, the ability to connect with others, and having technology available and feeling comfortable with technology as more potent motivators (more than half of the sample reported 'a great deal' for these items). Employer, learner and the practice community expectations as less motivating (with approximately half of the sample, 47.1% or 52.7% respectively, indicating these items as 'somewhat' important).

Table 3. Motivations for technology use (N = 697).

	Overall Mean (SD)	PE (*n* = 242)	FLE (*n* = 122)	OFE (*n* = 157)	HEd/A (*n* = 157)	F
Learner Expectations	2.25 (0.64)	2.10 (0.61)	2.33 (0.64)	2.24 (0.67)	2.43 (0.61)	9.12 ***,a,c,d
Instructional Objectives	2.43 (0.61)	2.35 (0.60)	2.44 (0.63)	2.38 (0.63)	2.55 (0.56)	3.79 **,c
Tech/Internet Availability	2.55 (0.64)	2.61 (0.58)	2.50 (0.67)	2.47 (0.71)	2.58 (0.65)	1.72
Comfortability	2.47 (0.62)	2.42 (0.61)	2.46 (0.64)	2.46 (0.64)	2.55 (0.61)	1.29
Employer Expectations	2.08 (0.72)	2.03 (0.68)	2.02 (0.76)	2.15 (0.72)	2.14 (0.75)	1.28
Facilitating Learner Interest	2.67 (0.53)	2.65 (0.53)	2.68 (0.53)	2.60 (0.56)	2.76 (0.48)	2.25
Ability to Organize Resources	2.61 (0.54)	2.62 (0.54)	2.60 (0.53)	2.61 (0.57)	2.61 (0.55)	0.02
Ability to Connect W/Others	2.52 (0.59)	2.51 (0.58)	2.64 (0.54)	2.50 (0.61)	2.48 (0.60)	1.90
Community Practice	2.35 (0.64)	2.30 (0.61)	2.45 (0.63)	2.34 (0.65)	2.33 (0.66)	1.43

Note: ** $p < 0.1$, *** $p < 0.01$; PE = parenting educator, FLE = family life educator, OFE = occasional family educators, HEd/A = Higher ed/administration;1 = not at all, 2 = somewhat, 3 = a great deal; [a] = significant difference between PE and FLE, [c] = significant difference between PE and HEd, [d] = significant difference between OFE and HEd.

6.2.4. Supports and Barriers

Perceived supports are listed in Table 4. In general, most items were rated near the middle of the range indicating modest agreement for the support. Highest means are indicated for having adequate internet and seeing other educators use technology. At the other extreme, technology discussed in staff meetings and having time to developing technology-integrated teaching were more likely to be viewed as neutral or worse.

Table 4. Perceived supports for technology use (N = 697).

	Overall Mean (SD)	PE (*n* = 242)	FLE (*n* = 122)	OFE (*n* = 157)	HEd/A (*n* = 157)	F
Educators Encourage Tech Use	3.50 (1.01)	3.40 (1.00)	3.51 (1.00)	3.53 (1.11)	3.64 (0.94)	1.64
Supervisor Encourages Tech Use	3.50 (1.05)	3.50 (1.03)	3.40 (0.98)	3.39 (1.13)	3.67 (1.04)	2.03
Exchange Tech Ideas W/Others	3.56 (1.05)	3.41 (1.06)	3.55 (1.07)	3.56 (1.08)	3.82 (0.93)	4.48 **,c
Other Educators Use Tech	3.98 (0.92)	3.89 (0.97)	3.88 (1.01)	3.92 (0.93)	4.26 (0.69)	5.82 **,c,d,f
Tech Discussed In Staff meetings	3.01 (1.14)	2.88 (1.13)	3.01 (1.09)	3.11 (1.20)	3.14 (1.14)	1.91
Variety of Programs Available	3.19 (1.13)	2.99 (1.14)	3.10 (1.14)	3.11 (1.13)	3.68 (0.96)	12.37,***,c,d,f
Tech Support Able to Help	3.22 (1.14)	3.13 (1.12)	3.02 (1.18)	3.18 (1.16)	3.57 (1.06)	6.21 ***,c,d,f
Tech Support Available	3.24 (1.13)	3.11 (1.12)	3.13 (1.18)	3.19 (1.12)	3.56 (1.05)	5.31 **,c,d,f
Adequate Tech Infrastructure	3.30 (1.08)	3.20 (1.07)	3.08 (1.09)	3.21 (1.04)	3.66 (1.04)	7.80 ***,c,d,f
Adequate Social Network Policies From Employer	3.29 (1.00)	3.16 (0.97)	3.24 (1.00)	3.40 (1.06)	3.41 (0.95)	2.65
Adequate Internet Access at Work	4.17 (0.96)	4.01 (0.96)	4.11 (1.13)	4.15 (0.92)	4.46 (0.77)	6.65 ***,c,d,f
Time to Develop Information and Communications Technology (ICT)	2.64 (1.10)	2.44 (1.05)	2.68 (1.23)	2.69 (1.03)	2.85 (1.09)	4.52 **,c

Note. ** $p < 0.1$, *** $p < 0.01$; PE = parenting educators, FLE = family life educators, OFE = occasional family educators, HEd/A = Higher ed/administration;1 = strongly disagree to 5 = strongly agree; [c] = significant difference between PE and HEd, [d] = significant difference between OFE and [f] = significant difference between FLE and HEd.

With regard to barriers (Table 5), five item means indicated barriers predominantly perceived as moderate to extreme. In frequency analysis three items were identified by more than half as being an

extreme barrier: lack of resources (53.1%), lack of recognition (52.3%), and content unsuited to deliver through technology (50.3%). Items with the lowest recognition as barriers included time to learn about technology, limited financial resources, and limited tech support for participants.

Table 5. Perceived barriers for technology use (*N* = 697).

	Overall Mean (SD)	PE (*n* = 242)	FLE (*n* = 122)	OFE (*n* = 157)	HEd/A (*n* = 157)	F
Lack Time To Learn About Tech	2.54 (0.88)	2.67 (0.84)	2.47 (0.92)	2.36 (0.87)	2.55 (0.91)	3.96 **,b
Low Tech Support For Participants	2.42 (0.93)	2.52 (0.91)	2.35 (0.96)	2.36 (0.93)	2.34 (0.90)	1.70
Low Tech Support For Self	2.27 (0.93)	2.45 (0.95)	2.13 (0.92)	2.21 (0.89)	2.15 (0.90)	4.68 **,a,c
Uncertain of Tech Copyright Usage	1.88 (0.83)	1.95 (0.84)	1.87 (0.84)	1.77 (0.82)	1.85 (0.80)	1.38
Low Financial Resources	2.43 (1.00)	2.37 (1.01)	2.51 (0.96)	2.46 (0.98)	2.38 (1.00)	0.64
Lack Access to Resources/Internet	1.79 (0.98)	1.83 (1.02)	1.83 (0.99)	1.80 (0.97)	1.67 (0.91)	0.90
Lack Teaching Skills	2.04 (0.87)	2.16 (0.85)	2.01 (0.93)	1.98 (0.93)	1.89 (0.78)	3.13 *,c
Lack of Models	2.12 (0.87)	2.23 (0.87)	2.02 (0.80)	2.03 (0.93)	2.04 (0.80)	2.65
Lack of Recognition	1.75 (0.92)	1.70 (0.87)	1.60 (0.83)	1.86 (0.97)	1.84 (1.00)	2.15
Uncertain of How to Start	1.77 (0.85)	1.80 (0.84)	1.82 (0.95)	1.73 (0.84)	1.72 (0.83)	0.46
Content Unsuited to Deliver Thru Tech	1.73 (0.86)	1.67 (0.84)	1.73 (0.88)	1.86 (0.89)	1.66 (0.78)	1.64
Changes in Tech	2.23 (0.93)	2.30 (0.89)	2.30 (1.06)	2.14 (0.93)	2.18 (0.91)	1.16

Note: * $p < 0.5$, ** $p < 0.1$, PE = parenting educators, FLE = family life educators, OFE = occasional family educators, HEd/A = Higher ed/administration;1-extreme, 2 = moderate, 3 = slight, 4 = not a barrier; [a] = significant difference between PE and FLE, [b] = significant difference between PE and OFE, [c] = significant difference between PE and HEd.

6.2.5. Training

When asked the extent to which training prepared them for effective use of technology in instruction, the majority (74.6%) rated 'learning on my own' as moderate or major extent. Fewer reported that staff (47.3%), professional development (50.9%), and undergraduate (42.6%) training influenced their ability to use technology in instruction to a moderate or major extent. The majority (85%) indicated that they need continuing education or professional development to maintain their license or credential. Technology as a required area of continued training was indicated by about one third (36.7%). Nearly half (47.3%) said 'no,' and 16.0% were uncertain.

6.2.6. Group Differences in Technology Use

Differences in technology use by practice group were observed in 10 of 12 applications (Table 2). Use of the Internet and blogs was consistent across groups. Largest differences were seen in the use of Excel (spreadsheets), with PE using it less than other groups, PowerPoint (presentation software) with PE and OFE using it less than FLE and HE, and learning management systems (e.g., Moodle, Blackboard). Highest use was by those in Higher Education/Administration Professionals (HE/A). In general Parenting Educators reported less frequent use of most technologies compared with other groups and HE/A reported more frequent use of technologies compared with other groups. Across job categories, significant differences were reported for number of employer provided technologies (F = 7.06, $p < 001$). HE/A reported the greatest number of employer provided technologies (M = 3.82, SD = 1.76); OFE reported the least (M = 2.76, SD = 1.79). No significant differences were reported for the number of self-provided technologies.

6.2.7. Group Comparisons on Motivations and Proficiency

Across job categories there were no significant differences on proficiency. Motivations for use showed variation in two cases (Table 3). Significant differences were reported for learner expectations and instructional objectives. In both cases, parenting educators were less likely than those in Higher

Education/Administration to rate the item as significant. Parenting educators also rated learner expectations as less motivating compared with FLE; Occasional family educators also rated this item as less motivating compared with those in Higher Education.

6.2.8. Group Comparisons on Technology Attitudes and Skills

Three of five attitude constructs showed differences across groups. Significant group differences appeared for "I like technology" (F = 4.77, $p < 0.1$), "technology is fun" (F = 2.48, $p < 05$), and "I look forward to using technology" (F = 4.1, $p < 0.1$). In each case parenting educators reported lower mean agreement to the items, and were significantly different from those in HE/A. PE were less likely to 'like technology' (M = 3.96, SD = 0.80), report that 'technology was fun' (M = 3.67, SD = 0.88), and "look forward" to using technology (M = 3.53, SD = 0.85).

Comparing across subgroups, one skill item mean showed variation across groups: designing technology-enhanced learning activities (F = 12.18, $p < 0.01$). Those in Higher Education/Administration (M = 3.78, SD = 0.82) reported more confidence in the skills to design technology-enhanced learning activities compared with the three other groups. PE (M = 3.15, SD = 0.99) also showed lower confidence in this ability compared with Occasional Family Educators (M = 3.44, SD = 1.05). The mean for Family Life Educators was 3.40 (SD = 1.40).

6.2.9. Group Comparisons on Workplace Supports and Barriers

As indicated in Table 4, across groups significant differences occurred in 8 of 12 support items. Those in Higher Education/Administration revealed significantly higher ratings on all 8 other items compared with Parenting Educators, and on 6 items with Family Life Educators and Occasional Family Educators. With regard to barriers (Table 5), there were two significant differences across job categories in perception of 12 items. Occasional Family Educators perceived having less time to learn about technology as more of a barrier than Parenting Educators. Family Life Educators and HE/A were more likely to rate limited technology support for themselves as a barrier compared with Parenting Educators.

6.2.10. Group Comparisons on Training

With regard to training that supports technology use in instruction, there were no differences across job categories for self-training. Group differences did occur for undergraduate training (F = 5.63, $p = 0.001$), professional development training (F = 9.53, $p < 0.01$) and staff training (F = 4.71, $p < 0.1$). In all three contexts, parenting educators reported less influence compared with one or more other groups. They were less likely to see undergraduate training as influential compared with Other Family Educators, and professional development as influential compared with all other groups. Those in Higher Education/Administration reported more influence from staff training compared with the three other groups. With regard to continuing training, parenting educators were more likely to need training to maintain a credential (98%, χ2 = 72.8, $^{df}= 3$, $p = 0.000$). PE were also more likely to need technology-specific training (57.9%), whereas it was less likely for FLE (15.3%) and those in higher education (18.4%, χ2 = 105.06, $^{df}= 6$, $p = 0.000$).

7. Discussion

As the field of family education looks into our collective future, it is critical that we anticipate areas of change in society and in our world that affect family life, that influence our learners and that affect our practice. Technology is one essential area of competence that is integrated in every aspect of our work. Whether we consider how families will live and the technology-related questions and issues they bring to professionals, and whether we focus on evolving ways that parents and families gather, exchange and produce knowledge that deploy the Internet as an environment, or we embrace the range of applications and devices that enable our collaboration and creativity, efficiency and outreach, information and communications technology is now at the forefront of our practice. This study

provides a field-wide perspective on technology adoption and use and professionals' perspectives on influences on that use. Its findings can inform our action in the systems of professional preparation, in-service training, institutional policies and advocacy that can best support to our professionals [46].

The professionals in this study represent and validate the reality of the range of individuals in the United States who identify as 'parent and family educators:' those who work full time and part time in family education, in non-profit agencies, government organizations, school districts, and more. They represent those on the 'front lines' who deliver educational programs in homes, through small groups and online, those who hold "non-family" or non-education positions whose work finds them occasionally working with families, like preK–12 teachers, or clergy or social workers. Some hold teaching licenses that require continuing education; most have college degrees; some hold PhDs. Professionals work with different audiences by age and education level. Unlike many of our education professional counterparts trained for relatively predictable audiences and classroom settings, and who adhere to nationally recognized standards, parent and family life educators' work is highly variable and diverse, and they adhere to no single established credential or national criteria for practice [22,47]. It is the challenge to the profession then, to embrace the diversity yet identify the ways in which the field as a whole can move forward, together [46].

7.1. Family Educators' Technology Use: 'It Depends'

The first major finding from this study is that family educators as a group possess positive attitudes toward technology and view themselves as proficient, yet the contexts in which they work offer a very mixed picture of supports for that technology use. With the caveat that 'use' is likely contextual and a construct still needing better understanding for the field of family education, this study suggests that family educators are most often using technologies that are familiar: email, searching the Internet and document preparation software. Sometimes they use social media, and they are least often (if at all) using more novel applications like Second Life (virtual reality). These results mimic those from the author's research with a smaller national sample of family educators in 2010 [42] and with state specific parenting educators in 2013 [31,40]. Yet it also reflects observations about other educator groups who, depending on the availability of resources, will default to technologies that are familiar and likely used in their personal lives [37,48]. Does the lack of innovation or change in use represent the actual needs in the field, or do these stubbornly static figures reveal a field limited in deploying novel technologies with their audiences? The average age of sample participants was 48, individuals barely beyond being considered "Baby Boomers" [10]. If most family education professionals reach Millennials (those between 23–38 years) in their practice (as evident from the 88% who report young adults and adults in their practice), and this demographic is more likely than other age groups to use social media and own a smartphone [10,49], is texting and social media 'sometimes' enough to stay current with their learners? Further research to understand the meaning and impact of such 'use' behavior is clearly needed.

More significantly, the results offer a glimpse of the factors that influence technology acceptance and adoption. For most, this supports Ertmer's notion of 'primary' influences [34]: the availability of devices, training, and encouragements. The results here are both positive, yet enlightening. Attitude items indicate a fairly positive outlook, and the majority of professionals rate their proficiency as average or better. This is similar to previous research with parenting educators by the author [31,40] and early childhood teachers [35,50]. Family educators appear to be most motivated by the functions of what technology provides to them—ways to make learning more interesting, a way to organize resources, a means for connecting to others—and when resources are available to them. They were least motivated by expectations for their use: from the professional community, from the learners, and especially from the employer. Do employers lack expectations of family educators' limited use? OR might their limited use reflect employers who lack vision for how technology integrates into family education practice [51]?

This picture of supports and barriers for family educators' technology use furthers our questions about practice. On the one hand, most seem to characterize their work settings as encouraging their use and they report good access to the Internet, at least. Yet meaningful structural supports may not be evident. Professionals observe that their time to learn is limited, and many lack a technology infrastructure. There is also limited recognition for their use (which would also connect to limited expectations by employers), and technology appears not to be a focus at meetings. It should be noted that although the professionals felt generally proficient, fully 47% observed that 'feeling uncertain where to start' was an extreme barrier to their use, and 45% disagreed or were neutral that they could design technology-enhanced learning activities. Might their ratings of proficiency be based on their frequent use of the most basic technologies like email and searching the Internet. Finally, professionals observed that the training most valuable to their integration of technology in practice was that provided by themselves, not on the job, in professional development or in pre-professional academic training.

The lack of supports and limited expectations matter. In our previous research with family educators, workplace conditions indirectly influenced technology acceptance [40] and use [31]. Parenting educators who reported higher workplace encouragements (talking about tech at meetings, employer expectations, etc.) and workplace infrastructure (adequate time, training and resources) were more likely to perceive technology as easy to use, and useful to their practice. Jointly, these precursor attitudes of perception influenced an acceptance to technology. In turn, these positive attitudes make it more likely that innovative applications—such as using Instagram for parent coaching to reach Millennial parents—will be tried even if they are less familiar with older professionals.

But this more precarious, variable picture can mean that technology use by our educators "depends." Indeed use depends on fit with instructional methods and aims. Building parent relationships in group discussions focuses more on the person to person communication than navigating a screen [52]. Yet, increasingly, contexts call for using information and communications technologies to connect with learners.to extend discussion beyond classes, to demonstrate a complex topic, and to reach new audiences [3,4,27].

It is not a stretch to imagine many family educators who see the value of technology, want to use it to make to their work easier and more engaging for learners, yet who are held back. They face inconsistent supports at their workplaces-limited devices, restricted time and training to try out new applications, minimal expectations that they deploy technology in their practice and limited recognition for using innovations when they do. The most motivated make the time, train themselves and when necessary bring in or purchase their own devices.

7.2. Differences in Family Education Job Type and Context

A second key finding from this study is that clear differences exist depending on the type of family education practice. Jobs ranging from full-time parenting educator to social worker who occasionally delivers education to a University professor who teaches undergraduate learners about families along with the demands of research and/or administration present different realities for teaching and audiences, and as seen here, different environmental conditions for technology use. These findings substantiate the general hypotheses of differences by family educator type, and give greater meaning to the 'it depends' framework that predicts differences by context.

Parenting educators in this sample demonstrated the weakest attitudes related to technology, express the lowest confidence in skills, used the least novel technologies and report some of the most minimal supports and greatest barriers to practice. Because this specific group represents those in one state and practice in common settings—school district Early Childhood Family Education (ECFE) programs we can consider shared workplace conditions might result in these differences. ECFE is largely a decentralized system of programs in the state, dependent on school district policies and practices [4]. Interviews with ECFE administrators indicate that school districts often distribute technology resources differently between K–12 teachers and classrooms, and community education (i.e., adult and recreational education that most ECFE programs are administered). Educators may

receive less training, technical assistance and devices for integrating technology in practice. The wealth of challenges faced by PE compared with other groups in this study suggests that their state pay more attention to these educators and identify ways to provide more resources and guidance for their technology use.

Family life educators (FLE) and occasional family educators (OFE) were distinct in their more frequent texting and social media. Occasional family educators report working with adolescents and with those with high-school education, so their technology behavior may reflect the interests of their audience. OFE were also less likely to use presentation and document preparation software. While this may reflect the infrequent instructional nature of their work, given that this group also reported the fewest number of employer-provided devices, limited use may also reflect limited resources. FLE work with mixed audiences may teach specific content foci (like nutrition or financial management) or a range of topics. While they are also more likely to 'look forward' to working with technology they, too, observe an infrastructure of devices, training and time that is not supportive of their practice. Further research on both these groups would help our understanding of the nuances for their choices and attitudes.

Those who work in Higher Education/Administration demand special attention. They clearly stood out in a number of ways. Demographically, HE/A are different from the other groups in ways that would be expected: they hold higher degrees, and college and graduate level, young adults are their learner groups. Their technology use includes learning management systems far more frequently than the other groups. This would align with a movement in higher education to online and blended teaching [53]. HE/A professionals also demonstrate more confidence in technology skills in nearly all areas, show higher attitude scores and importantly, indicate the presence of all supports for their technology use more than other groups. They are also more likely to perceive the lack of teaching skills an extreme barrier to their use. As they are also more motivated by learning objectives and learner expectations, they may be more sensitive to their need for teaching skills.

This context of technology use, supports and resources for those in Higher Education/ Administration in sharp contrast with the other groups of practitioners who work in community settings urges caution. The next generation of family education practitioners are being prepared in university and college programs. Yet more than half the respondents in this study reported that their instructional technology use was *not* influenced by their undergraduate training. Perhaps the context of higher education, with its more privileged and daily technology use tailored to the needs of a specific, well-educated audience, might be out of sync with the learning needs of 21st century professionals they are preparing. This suggests even more strongly that standards of practice specific to technology integration are needed. Universities align their curricula to prepare students to become Certified Family Life Educators [54], just as colleges that prepare preK–12 teachers adhere to standards set forth state teacher licensing standards. Yet teacher licensing in the US has embraced technology knowledge and skills advocated by groups such as the International Society for Technology in Education (ISTE) [55]. To date, detailed descriptions of components of effective family life education methodologies [56] or knowledge and skills needed by parenting educators [41] fail to articulate competencies specific to using technology and inclusion of the virtual world as an environment for planning, implementation and evaluation. The vast differences in how those in higher education and those in practice are supported to use technology suggest that without standards that organize family education preparation, the divide may continue. At the very least, these differences indicate that further study of technology use by professionals who identify as family educators should attend to practice context differences.

The limitations in the study must be noted, as tentative conclusions are drawn. The sampling method mixed explicit (parenting educators in one state; extension educators in another) with broad groups of professionals nationally. While this yielded a categorically diverse and somewhat representative sample, it was not random and carries with it some bias of location. Further study inclusive of parenting educators and with extension educators from additional states that are more geographically representative and that have different credentialing guidelines [41] is recommended.

Refining extant frameworks of technology integration through application on a field as diverse as family education requires that our samples truly generalize to the range of practice conditions and practitioners.

7.3. Looking Ahead—Together

This mixed picture of family professionals' technology use and resources for their use suggests most clearly that technology be embraced by the field in ways that send messages to the workplace and to preparation programs to provide adequate resources and supports. While realistic differences in education setting and audience characterize the field (e.g., reaching students in formal university education by some and new mothers through home visits by others), we cannot rely on a model of 'it depends' that exposes differences in technology supports and resources to our professionals. As the field of family education looks forward, what is needed is attention more unified to the needs, training, preparation and institutional context of supports related to technology content knowledge and practice.

A place to start is with competency standards for technology use in family education. Decades of learning technology research inform guidelines for the professional practice, certification and licensing, and preprofessional preparation of teachers in formal education. Groups such as ISTE offer guidelines on teacher technology knowledge, skills, attitudes, aptitudes and competencies that have been adopted by state licensing boards. These ensure that new and continuing teachers are prepared, and they maintain a set of standards that reflect current research on technology use in education. Ongoing research informing these standards respects a wide range of learning needs, devices, applications, contexts learner expectations and wider social and ethical practices. In turn, institutions use these standards to prepare practitioners to integrate technology into their instruction and service in ways that reflect their 'adaptive expertise' [16] to meet changing needs of learners and contexts. To some extent standards related to technology knowledge (content standards) and pedagogy (practice standards) are evident in family professional and family education accrediting group requirement (e.g., Certified Family Life Educator (NCFR), the American Association of Family and Consumer Sciences, AAFCS) [46]. Yet as noted, technology in parenting family education methodology standards is merely implied, leaving 'use up-to-date teaching methods' open to interpretation.

Another strategy is for our professional associations to hold technology at the forefront of conferences, trainings, publications and funding for research. This sends the message of importance and further encourages the non-profits, government agencies, school districts and other workplaces that employ family educators to provide equitable and quality resources. While the field of family education is, indeed, diverse and will require the tailoring of standards to family content and the range of audience-targeted contexts and instructional methods, universally accepted standards can send a clear message as to the importance of these competencies in the training of professionals, and can affect course work content and experiences, and continued attention in conferences, publications and research to stay abreast of changes in innovation. Without a unified approach, a field of professionals "left to their own devices" will make us seem out of sync as our society moves further into the 21st century. Worse still, without unified and consistent attention around technology, our family education professionals will be unable to fully attend to families' changing needs.

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