

Child Care Administrators Leading Quality Improvement at Work: Access to and Use of Technology

Jade Burris^{1*} Rena Hallam²

1.College of Education and Social Work, West Chester University of Pennsylvania, West Chester, PA 19383, United States

2.College of Education and Human Development, University of Delaware, Newark, DE 19716, United States

* E-mail of the corresponding author: jbarris@wcupa.edu

Abstract

This study is an examination of the access to and use of technology by 128 child care administrators participating in Delaware's Quality Rating and Improvement System (QRIS). It is in response to how little research had been conducted on child care administrators' access to and use of technology for their own work given the prevalence of technology in modern society's every day activities. Having a better understanding of how technology is being used will help guide professional development efforts for administrators leading quality efforts in their programs. Through survey research methods, this study explored the overall access to technology by administrators with examination of the differences in access to and use of technology by program type and geographical location. Participants were asked about their access to and use of basic technologies including desktop or laptop computer, working printer, high-speed Internet, mobile technologies like tablets or an iPad, and the Microsoft® Office™ bundle. Findings indicated that administrators across program types had adequate access to a variety of basic technologies to assist in their work although differences were found in how frequently and which types of technology were used. Overall, the results of this study provide practical considerations to support increased use of technology by child care administrators with recommendations for further investigation into more current and mobile technologies.

Keywords: child care administrators, early childhood education, leadership, quality rating and improvement systems, technology

1. Introduction

Computers and mobile technology have become widely adopted as sought-after tools in education. Technology is more readily available than ever before, becoming more accessible to all, and it is likely here to stay (NAEYC & Rogers, 2012). In fact, given society's rapid acceptance of technology in every-day activities, the integration of technology at all levels of the education system will likely only accelerate (Hernandez et al., 2015). Studies that have focused on technology integration in early childhood education (ECE) have found that despite the increased access to computers and mobile devices, the actual use of technology in ECE remains infrequent (Blackwell, Lauriella, Wartella, 2014). The majority of studies have focused specifically on technology for teaching and learning with young children (Haughland, 1999; Haughland, 2000; Sivin-Kachala & Bialo, 2000; Kirkorian, Wartella & Anderson, 2008; Parette, Quesenberry, & Blum, 2009) including identifying concerns with its integration (Elkind, 1998; Judson 2006; Keengwe et al., 2008; Rosen & Jaruszewicz, 2009). Much less attention has been paid to how early childhood teachers use technology for their own work (Clark, 2007; Parette et al., 2013) while even less focus has been on understanding how leaders of child care programs (e.g., child care administrators), use technology for their own work (Simon & Donohue, 2012). While the literature on child care administrators in early childhood settings and their use of technology is limited, extant research findings from K-12 educational settings highlight key aspects of how program technology and leadership may interact to influence educational practice.

2. Early Childhood Education Landscape in the United States

In the United States, the field of ECE is essential in helping families work and preparing children to succeed in primary school (Clark, 2007). Child care has grown rapidly in recent decades, with more and more children attending full day care (Bloechliger & Bauer, 2016). It has been well documented that the early years, birth to age five, spent in quality child care has substantial payoffs including success in school and in life (Lynch, 2004). The majority of research on child care quality has focused on instructional practices with less emphasis on the administration and leadership of early childhood programs (Rodd 1997; Bloom 1997; Bloom 2000; Muijs et al., 2004).

The National Association for the Education of Young Children (NAEYC) defines the program administrator/director as the individual responsible for planning, implementing, and evaluating a child care program in addition to leadership and management functions (NAEYC, 2008). The scope of the responsibilities administrators have is similar to elementary school principals who oversee curriculum and child assessment, supervision and evaluation of teachers, human resource allocation, family engagement, community outreach, and

fiscal matters (McCormick, 2012) although the training and support is arguably different. Administrators promote the vision and mission of a program and create strong relationships between teachers and families of children using their services. They need to be knowledgeable in group dynamics, child development, and teaching strategies as well as having the ability to balance a budget and solve ethical dilemmas (Bloom, 2000). At the time of this study, the early childhood literature had largely focused on classroom practices and teacher's technology use/integration with much less attention to administrator's efforts to support effective implementation in their programs. Administrators of ECE programs are an understudied population and very little had been researched in terms of their influence on effective practices in the child care settings especially around leveraging technology for their own work.

3. Integrating Technology

An emerging body of research confirms the pivotal leadership role child care administrators play in the centers' quality equation (Bloom & Abel, 2015). The generally low quality of child care in the United States, documented over the last decade, has led to a focus on improvement systems as change agents (Zellman & Perlman, 2008). Quality Rating and Improvement Systems (QRIS) have the potential to be effective systems for improving the quality of leadership and child care services in early childhood programs (McCormick, 2012). They are also the driving force behind increased training opportunities and integrating technology into practice. While keeping up with each and every technological breakthrough is nearly an impossible feat (Kereluik et al., 2011), ECE administrators must receive training and resources to integrate technology effectively in their programs.

The use of computers and other digital technologies continue to increase in early childhood classrooms, and technology is being used as a tool for improving program quality in interesting ways (Donohue, 2003). Many early childhood administrators have eagerly adopted the innovation (Donohue, 2003; Bloom, 1997) although simply having access to technology does not result in the use of technology effectively. Blackwell, Lauricella, & Wartella (2014) found that in a sample of 3150 early childhood teachers, 97% reported access to computers and 96% reported Internet access although only 55% of family child care teachers reported access to computers. Research shows that teachers do not feel prepared to integrate technology in their instruction and many states are not requiring technology training (Inan & Lowther, 2009) including training for child care directors. Many teachers also cite ineffective technological leadership strategies in their schools as a big barrier to technology integration efforts (Keengwe & Onchwari, 2009). Brockmeier, Pate, and Leech (2010) found that principals are a crucial part of the process in facilitating the integration of technology into practice, including the responsibility for the leadership in knowing how to best use technology and support teachers in their adoption of it. Child care administrators, similar to principals, play a key role in encouraging or hindering teachers' use of technology including leading by example (Hernandez, et al., 2015).

Although the position requires a comprehensive set of skills, many administrators never receive training on leadership or management (Bloom, 1997) nor do they receive adequate training on how to use technology (Hernandez et al., 2015). Similarly, while principals have been identified as important to the process of technology integration in schools, they are often overlooked while teachers continue to receive training (Brockmeier, Pate, & Leech, 2010). Administrators have the ability to improve practice through their technology knowledge and skills including the implementation of cutting-edge curricula, family engagement strategies (such as online applications like Tadpoles®, program-wide websites, electronic newsletters), and innovative professional development opportunities (online videos, web-based training, distance education courses, and online ECE programs).

After 30 plus years of using computers and technology in ECE, administrators must be prepared to not only lead the integration of technology in their programs but also effectively use it for their own work, which has evolved over the past decade. The adoption and effective use of technology is becoming a pre-requisite for accessing state systems (e.g. child care subsidy programs) and in some states licensing and participating in QRIS including accessing related data systems, reviewing classroom assessment reports, and engaging in technical assistance. Additionally, child assessment systems like Teaching Strategies GOLD® now have interactive and online solutions that are proven valid and reliable with full alignment to state early learning guidelines. Furthermore, administrators need to leverage technology for the general growth of their program including marketing, hiring, and fundraising efforts.

The recognition of quality in early childhood programs has increased over recent years (Bloechliger & Bauer, 2016) although evaluating the quality of early childhood programs has been high on the research agendas of early childhood educators since the early 1980s (Katz, 1994). Given their leadership roles, administrators are often referred to as the gatekeepers of quality (Bloom & Bella, 2005) and a child care program managed by a technology-literate administrator clearly has an advantage in our highly digital age (Donohue, 2003). Research on program quality has found a significant positive relationship between the quality of administrative practices and the quality of the children's learning environment in center-based programs (Talan, Bloom, & Kelton, 2014).

For directors, administering a quality program requires working knowledge of existing and emerging technologies (Bloom & Bella, 2005) although many are not equipped with the computer skills needed to successfully apply and integrate technology in their programs. Historically, professional development and training has paid little attention to the distinctive needs of early education (Chen & Price, 2006). It cannot be denied that the demands of participating in QRIS have changed the expectations for early childhood professionals in how they use technology to manage program operations through complex databases and training systems.

In light of the limited research regarding administrators' use of technology for their work and the continued national discussion about the value of technology in education, we sought to investigate their access to and usage of technology. The research questions that guided this study were:

1. What technologies can administrators already access at work?
2. What technologies do administrators use at work and how frequently?
3. Are there differences in administrator's access to and use of technology based on the type of program they lead?

4. Methods

Prior to the study, Institutional Review Board (IRB) approvals were obtained. Participants were notified of their voluntary participation and anonymity through an online consent form. The participants represented a stratified random sample where administrators were classified by program type and geographical location/county. Program type was defined as 1) Community-based (small and large programs), 2) Private (Head Start, Early Childhood Assistance Program, and school districts), and 3) Family child care homes (located in a private residence). These are the same categories under which the Office of Child Care Licensing licenses the programs. County location included New Castle, Kent, and Sussex counties, which are geographically situated north to south in the state of Delaware. All of the child care administrators were working in programs voluntarily participating in Delaware's QRIS. Table 1 provides demographic information for the sample. The majority of the administrators surveyed were white or African American women aged 31-60 with an earned bachelor's degree that was not in ECE. More than half of the administrators did have an Associate's degree or college coursework in the field of ECE.

Table 1 Participant Demographic Information (N=128)

Characteristic	Number	Sample %
Age in years		
24-30	13	10
31-40	29	23
41-50	43	34
51-60	36	28
61-67	4	3
No response	3	2
Gender		
Female	122	95
Male	3	2
No response	3	2
Race/Ethnicity		
American Indian/Alaska Native	1	<1
Asian	1	<1
Black/African American	37	29
White	75	60
White/Hispanic	5	4
Other	2	2
No response	7	5
Highest Education Completed		
High school/GED	4	3
Some college	18	14
Associates degree	27	21
Bachelors degree	39	30
Graduate credits	15	12
Graduate degree	22	17
No response	3	2
ECE Education Experience		
CDA	3	2
Associates degree	31	24
Some ECE credits	42	33
ECE bachelors degree	22	17
Graduate ECE credits	11	9
Graduate degree	7	5
No response	12	9

Note: Percentages do not equal 100% with rounding

5. Analysis

A custom survey was used to collect administrator's responses regarding their access to and use of technology for work. The survey developed for this study utilized one checklist for access to technology (1=yes, 2=no) and a Likert scale to measure use of technology. Use was measured using a 5-point scale, ranging from 5 (Multiple Times Daily) to 1 (Never). The survey was transferred to an online survey tool and the survey link was emailed to 272 program administrators. In total, 153 (56%) administrators responded to the survey although only 128 (47%) identified their program type and were used in this study. The responses collected reflected 72% (N=92) community-based programs (small and large centers), 19% (N=24) family child care homes (located in a private residence), and 9% (N=12) private programs (Head Start, Early Childhood Assistance Program, and school districts). The differences in sample sizes were reflective of the QRIS participation at the time.

A One-way Analysis of Variance (ANOVA) was used to examine the question of whether administrators of the three types of child care programs differ with respect to their access to and use of technology for work. The analysis of the data, using Levene's Test for Equality of Variances, revealed that the homogeneity of variance assumption was violated. Therefore, a Welch ANOVA was used with a Games-Howell post hoc test to determine where the significance occurred between groups.

6. Results

6.1 Technology Access at Work

Interpretation of the data from the three program types showed that the administrators had adequate access to a variety of technologies to use at work. Table 2 summarizes these results. The highest rates of access were found

for printers (M=1.10, SD=.30), high speed Internet (M=1.10, SD=.30), and Microsoft Word (M=1.10, SD=.30). The lowest rates of access were found for mobile devices such as iPads or tablets (M=1.80, SD=.40). The results indicated that PowerPoint was more accessible to administrators in private programs (M=1.08, SD=.29) than family child care homes (M=1.42, SD=.50), a statistically significant difference, 95% CI [.009, .658], p=.043.

Table 2 Access to technology at work by program type

Survey Item	Community-Based N=92		Private Programs N=12		Family Child Care N=24	
	Yes N (%)	No N (%)	Yes N (%)	No N (%)	Yes N (%)	No N (%)
Desktop Computer	81 (88)	11 (12)	11 (91.7)	1 (8.3)	17 (70.8)	7 (29.2)
Laptop	49 (53.3)	43 (46.7)	7 (58.3)	5 (41.7)	15 (62.5)	9 (37.5)
Printer	85 (92.4)	7 (7.6)	11 (91.7)	1 (8.3)	19 (79.2)	5 (20.8)
High Speed Internet	82 (89.1)	10 (10.9)	11 (91.7)	1 (8.3)	22 (91.7)	2 (8.3)
Mobile device	19 (20.7)	73 (79.3)	1 (8.3)	11 (91.7)	5 (20.8)	19 (79.2)
Word	86 (93.5)	6 (6.5)	11 (91.7)	1 (8.3)	18 (75)	6 (25)
Excel	80 (87)	12 (13)	11 (91.7)	1 (8.3)	15 (62.5)	9 (37.5)
PowerPoint	65 (70.7)	27 (29.3)	11 (91.7)	1 (8.3)	14 (58.3)	10 (41.7)

6.2 Frequency of Technology Use

Use was measured using a 5-point scale, including Multiple Times Daily(1), Daily(2), Weekly(3), Monthly or less(4) and Never(5). Table 3 summarizes these results. Computers were the most frequently used technology (M=1.32, SD=.69) and administrators responded that they used them multiple times daily or daily. High speed Internet was the second most used technology (M=1.40, SD=.83) followed by search engines (M=1.58, SD=.83), Microsoft® Office™ (M=1.75, SD=1.17), and email to families (M=2.31, SD=1.55) and staff (M=2.73, SD=1.67).

Table 3 Administrator's use of technology

Survey item	N	M(SD)
Computer	120	1.32(.69)
Internet	122	1.40(.83)
Email to Families	122	2.31(1.55)
Microsoft® Office™	122	1.75(1.17)
Search Engines	121	1.58(.83)
Email to Staff	122	2.73(1.67)

*Not all participants responded therefore N varies.

6.3 Differences in Access and Use

Post hoc comparisons, using the Games-Howell post hoc procedure, were conducted to determine which pairs of the program means differed significantly in technology use. These results are depicted in Table 4 and show that across all program types, administrators used technology to support their work. The results showed means that corresponded to use at least weekly up to multiple times daily for computers (1.00-1.78), Internet (1.00-1.78), Microsoft® Office™ (1.27-2.87), and search engines (1.27-2.05) across all program types.

Table 4 Post hoc results for use of technology by program type

	N	M(SD)	Mean Differences			95% CI	
			1	2	3	Lower	Upper
Computer						1.19	1.44
1. Community	86	1.23(.69)	--			1.08	1.38
2. Private	11	1.00(0.0)	.23**	--		1.00	1.00
3. Family	23	1.78(.67)	.55**	.78***	--	1.49	2.07
Internet						1.25	1.55
1. Community	88	1.35(.85)	--			1.17	1.53
2. Private	11	1.00(0.0)	.35**	--		1.00	1.00
3. Family	23	1.78(1.41)	.43**	.78**	--	1.41	2.15
Email to Families						2.03	2.59
1. Community	88	2.06(1.46)	--			1.75	2.37
2. Private	11	2.64(1.91)	.58	--		1.35	3.92
3. Family	23	3.13(1.49)	1.07*	.49	--	2.49	3.77
Microsoft® Office™						1.54	1.96
1. Community	88	1.51(.96)	--			1.31	1.71
2. Private	11	1.27(.65)	.24	--		.84	1.71
3. Family	23	2.87(1.42)	1.36**	1.59***	--	2.25	3.49
Search Engines						1.43	1.73
1. Community	88	1.50(.96)	--			1.33	1.67
2. Private	11	1.27(.65)	.23	--		.84	1.71
3. Family	22	2.05(.89)	.55*	.77*	--	1.65	2.44
Email to Staff						2.43	3.03
1. Community	88	2.63(1.59)	--			2.29	2.96
2. Private	11	1.18(.60)	1.44*	--		.78	1.59
3. Family	23	3.87(1.58)	1.24**	2.69***	--	3.19	4.55

* p<.05, **p<.01, *** p<.001

The results indicated that administrators of private programs used technology more frequently than that of community-based and especially more frequently than family child care administrators for all technologies except email to families. Community-based administrators used email to families most frequently (M=2.06, SD=1.46). Significance was not found for comparisons between community-based program administrators and administrators of private programs for use of email to families, Microsoft® Office™, or search engines. Additionally, there were no significant differences between administrators in private programs and family child care programs regarding the use of email to families. Administrators of these two programs types used email to contact families less frequently than those of community-based programs.

7. Discussion

7.1 Technologies At Work

The purpose of this study was to examine the access to and use of technology by child care administrators participating in Delaware's Quality Rating and Improvement System. Managing a child care program that participates in QRIS is challenging and complex. It includes daily challenges that are more manageable using technology even though child care has been referred to as a low-tech profession with a strong preference for high touch learning experiences (Donohue, 2003). To succeed in the digital information age, child care administrators need regular access to technology, especially with the demands presented by participating in QRIS including database management, family and staff communication, and various layers of electronic documentation. At the time of this study, there was little research on administrator's access to technology although existing research on ECE teacher's access to computers and Internet showed that the majority had access to computers and Internet at work (Hernandez et al., 2015).

Blackwell, Lauricella, & Wartella (2014) study found that a majority (96%+) of center-based teachers reported access to computers and the Internet although only 55% of family child care teachers reported access to computers. Those are consistent with the results of this study showing high rates of access to basic technologies for administrators of all program types. The National Education Association (2008) published similar results in their evaluation of teacher's use of educational technology related to administrative tasks that used processing software, spreadsheets, presentation tools, and software for managing student records.

It is interesting that more than half of the administrators in this study had access to both desktop and laptop computers indicating the need for mobility in their work station beyond their desk although the lowest rates of access were found for mobile devices, which may be attributed to what Blackwell, Lauricella, & Wartella (2014) refer to as first-order intrinsic barriers such as time to learn and use technology, training and support, and

professional development for these devices. Another barrier to accessing mobile devices may be cost. Further, Baran (2014) noted that we are just now seeing an increasing trend of mobile learning in teacher education contexts.

More than 90% of the administrators had access to high speed Internet for at least 6 months of the year which is consistent with the National Education Association (2008) report that found 94% of teachers used the Internet for administrative tasks. The prevalence of technology in early childhood settings may be due to the recent recognition that technology can be leveraged to improve teaching practices and children's learning (Barron, Kemker, Harmes, & Kalaydjian, 2003; Diamond, Justice, Siegler, & Snyder, 2013; NAEYC, 2012) and the reality that many of the tools to support these efforts are online. Furthermore, administrators play a key role in either encouraging or hindering teachers' use of technology and through access, administrators can lead by example, which has been identified as one of the most effective strategies to encourage successful teacher use (Hernandez et al., 2015).

7.2 Frequency of Technology Use

In education there has been a general resistance to using technology but in-school computer access is now relatively universal (Gray, Thomas, & Lewis, 2010). Having access to technology is a step in the right direction but this study was interested in how often the administrators were using the technology. Stone-MacDonald & Douglass (2014) suggested that early childhood educators used technology more for personal use rather than for work related tasks. The results of this study showed that administrators used technology regularly, daily or even multiple times daily. The least use was reported for emailing staff and families. One reason that administrators in early childhood programs may use these technologies less frequently even though they have access to it is the lack of time available to use it (Hernandez, et al., 2015). They may be using other more convenient technologies such as texting or phone calls, which receive a quicker response time. Another possibility is that programs using online portfolio systems like Tadpoles® are likely engaging families through the application which sends direct messages.

7.3 Differences in Access and Use

The final research question guiding this study focused on differences between administrators across program types (community-based, private, and family child care). The results indicated that administrators of private programs used technology more frequently than that of community-based and especially more frequently than family child care administrators for all technologies except email to families. The elevated use by administrators of private programs may be related to the substantial performance standards they are required to adhere to, the additional funding sources they have access to, or the professional development and training they receive that is not accessible to family child care or community-based center administrators. The lack of use by family child care administrators, who often serve as the only employee of their program, compared to private child care administrators may be attributed to barriers such as technological literacy, lack of support from others, and lack of time to use technology (Hernandez et al., 2015).

Data from this study demonstrated that there were differences in administrator's access to and use of technology depending on program type. These differences point to a need to individualize technology training for administrators based on their individual and programmatic needs (Aubrey, Godfrey, & Harris, 2012). The needs for family child care administrators vary greatly from a community-based administrator who is not responsible for the primary teaching responsibilities during the workday. Because many child care administrators are classroom teachers first, they are not formally trained or prepared for the job of administrator. Blackwell et al. (2013) found that home-based programs were more likely to leverage personal devices like e-readers because they were readily available and comfortable using them.

We must also be aware that having a higher degree has been associated with access to technology, particularly mobile technologies, while ECE professionals historically have lower degrees (Blackwell et al., 2013). To address the issue of advanced education, we can focus on professional development and technology training with opportunities for online learning and accessible services available at low- or no-cost on the Internet. Training must demonstrate how technology is relevant for accounting, record keeping and documentation, communicating with families and staff, purchasing materials or supplies, using cameras/video software for documentation and training, and even for monitoring and security purposes. Further, professional development must acknowledge the impact of participant attitudes, which have been found to be significantly influential on actual technology integration (Blackwell, Lauricella, & Wartella, 2016).

8. Conclusion and Future Research Directions

These results provide insight into administrators' access to and use of technology in their own work and showed that there are differences between the program types indicating one size does not fit all. Further investigation is needed to identify how administrators are using the technology at work and what, if any, supports they require in

leveraging technology as a tool to support their important role. The field will benefit from future research focused on more current tools (software and online applications) that administrators are using including how they are being used effectively to support QRIS leadership. Further investigation of what devices are being used regularly to support their work and why these choose these devices will help guide professional development efforts related to technology integration.

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Dr. Jade Burris is an Assistant Professor in the Department of Early and Middle Grades Education in the College of Education and Social Work at West Chester University. She teaches in the undergraduate early grades preparation program, early childhood minor, and in the early childhood M.Ed. program. Dr. Burris holds degrees in Educational Leadership with a concentration in Curriculum, Technology, and Higher Education (Ed.D.), Curriculum and Instruction (M.A.E.), Early Childhood Education (M.Ed.), and Special Education (B.A.). Previously, she taught young children in community-based early childhood settings before transitioning to teaching in higher education. Her scholarship focuses on leveraging technology to improve educational outcomes, in-service and pre-service teacher professional development, and quality learning environments.

Dr. Rena Hallam is an Associate Professor in the Department of Human Development and Family Studies at the University of Delaware and also serves as Associate Director for the Delaware Institute for Excellence in Early

Childhood (DIEEC). Her research focuses on strategies for improving the quality of both center-based and family child care environments with an emphasis on the design and implementation of state systems and policies. She has served in a lead investigator role across multiple federally funded research projects on topics of early childhood transition, child assessment, and the intersection of child care quality and subsidized child care. Currently, she is Principal Investigator on a federally funded study of professional development approaches to support and enhance the quality of care in family child care settings and Co-Principal Investigator of the “Starting At Home” project designed to study the impact of a parent-child intervention implemented by Early Head Start home visitors. Dr. Hallam has significant research and practice background in working with low-income, culturally diverse children, families, and staff in both Head Start and child care settings. She has served as Program Coordinator for an Early Head Start program, Director of a university laboratory preschool, and Director of Delaware’s Quality Rating and Improvement System.