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If You Build It, Will They Come? Predictors of Teachers' Participation in and Satisfaction with the *Effective Classroom Interactions* Online Courses

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Abstract

The *Effective Classroom Interactions* (ECI) online courses were designed to provide an engaging, effective and scalable approach to enhancing early childhood teachers' use of classroom practices that impact children's school readiness. The created courses included several versions aimed at testing whether or not certain design aspects could increase participation and subsequent learning outcomes. The purpose of this study was to examine the extent to which early childhood teachers accessed the courses and varied in their (a) participation in the core course content and (b) optional discussion board as a result of the course experience they were assigned to as well as individual characteristics that may be associated with participation. As might be expected, findings indicated that early childhood teachers accessed the course often on nights and weekends, even though participating centers allowed their teachers to do coursework during work time. In addition, participants reported high levels of satisfaction with their experience. Both persistence in the ECI courses and overall completion of activities were higher than those reported in other studies of online learning. The participation of early childhood educator teachers was consistently predicted by comfort with technology, credit or non-credit status and assignment to the group that included regular conferences with the instructor. These relationships, however, did not always occur in expected ways. Implications for exploring online learning as a feasible option for early childhood educators are discussed.

Keywords: online course participation, early childhood teachers, participation predictors

Introduction

Access to online learning opportunities has increased to a staggering rate in the last few years, though many studies show much lower completion rates than their in-person counterparts (Jaggars & Xu, 2010; Xenos, 2004). Recently, Norris (2010) specifically called for online courses for early childhood teachers to better meet their needs for flexible courses and training demands (Early & Winton, 2001), yet no previous research has examined their participation in online courses. Knowing if and how early childhood teachers will participate in online learning is key to understanding if this is a feasible option and wise investment for the development of future education programs. Thus, the current study aims to fill this gap by examining two uniquely designed online courses, *Supporting Young Children's Social, Emotional, and Regulatory Development* and *Supporting Young Children's Thinking and Early Language and Literacy Skills*, and early childhood teachers' participation in them. In addition to exploring course use, this study will examine individual characteristics that may be associated with participation.

Online Coursework and Early Childhood Teachers' Need for It

The last few years have seen a dramatic increase in online course offerings, with many programs directly targeting teachers (Gill, 2011). Online courses have several advantages related to scalability, implementation fidelity, and efficiency. There is now considerable evidence documenting the ways in which online courses are more efficient than their in-person counterparts (Association for the Study of Higher Education [ASHE], 2006; Carey, Kleiman, Russell, Douglas, & Louise, 2008; Kurthen & Smith, 2006). In addition, many online courses are built using pre-populated video lessons, ensuring high fidelity of implementation (LoCasale-Crouch et al., 2011). Further, studies show that learners in online courses demonstrate the same or better content knowledge gains than their counterparts who are exposed to content in a more traditional (i.e., in-person) setting (Angus & Watson, 2009; Lebec, 2007; O'Dwyer, Carey, & Kleiman, 2007; Rice, 2006; Roblyer, Porter, Bielefeldt, & Donaldson, 2009; Tallent-Runnels et al., 2006). An online learning experience, properly designed, could permit high-quality implementation of coursework (Donohoe, Fox, & Torrence, 2007; Garrison, Anderson, & Archer, 2000).

With the reauthorization of the federally funded preschool program, Head Start, which included mandates for 50% of lead teachers to have a bachelor's degree and all teaching assistants to have a Child Development Credential (Improving Head Start for School Readiness Act of 2007), and with states expanding their prekindergarten programs that link teacher qualifications to the K–12 system, the demand for early childhood teachers to engage with higher education institutions for professional development and advanced training is quite evident. According to a 2006 national report, there are more than 1,200 higher education institutions that offer some kind of degree program in early childhood education, and they award approximately 36,000 early childhood

certificates annually (Maxwell, Lim, & Early, 2006). The majority of their training involves coursework. Early childhood teachers, however, report difficulty participating in typical college coursework due to multiple issues, including competing work commitments, family responsibilities, and geographic constraints (Early & Winton, 2001). Thus, online coursework could potentially address early childhood teachers' access issues and their need for professional development enrollment flexibility (Norris, 2010).

Effective Classroom Interactions (ECI) Online Courses for Early Childhood Teachers

The *Effective Classroom Interactions* (ECI) online courses were designed to provide an effective and scalable approach to enhancing early childhood teachers' use of classroom practices that directly impact children's school readiness. The first course, ECI-1, entitled *Supporting Young Children's Social, Emotional, and Regulatory Development*, focuses on enhancing teachers' knowledge of children's development in these areas and the specific classroom interactions and teaching strategies shown to be effective in promoting them. The second course, *Supporting Young Children's Thinking and Early Language and Literacy Skills* (ECI-2), focuses on improving teachers' use of cognitively stimulating instructional interactions and effective language and literacy practices.

Lessons and activities for the online courses were designed based on theories of adult learning (Knowles, Holten & Swanson, 2011; Knowles, 1996), instructional design (Keller, 1987; Keller & Kopp, 1987; Dick, Carey & Carey, 2001), Community of Inquiry (Garrison, Anderson & Archer, 2000; Garrison & Arbaugh, 2007), and research on multimedia learning (Mayer, 2008). Online activities were designed to feel relevant and practical to early childhood teachers. For example, the activities use real classroom footage and provide interactive, task-oriented experiences rather than passive or lecture-based lessons. They also provide opportunities for learners to reflect on new knowledge and share their own experiences in the classroom. In general, the online learning format provides adult learners with the ability to be self-directed in their learning but engage with the content and with others in meaningful ways.

In addition to creating the courses as an engaging experience, two additional components were developed to increase course participation and effects. One component, known as reflective writing, involves teachers writing about a particularly challenging child and how the content learned relates to and can improve their relationship with this specific child. The reflective component is based on research indicating writing about these types of feelings correlates with improved well-being (Smyth, 1998) and intrinsic motivation (Sheldon & Lyubomirsky, 2006).

Finally, a third component, conferencing with an instructor, involves talking in depth with an instructor after implementing the content taught. In order to have the greatest potential impact on teachers' practice and children's learning, the conference component blends elements of coaching that have demonstrated efficacy in enhancing teachers' classroom interactions (Downer

et al., 2013; Pianta, Mashburn, Downer, Hamre, & Justice, 2008) and children's learning (Mashburn, Downer, Hamre, Justice, & Pianta, 2010). Because most of the learning in the courses is based on pre-populated video activities, the instructor resources for these online courses can be used to provide individualized feedback to teachers about their teaching practice (Means, 2010). This is consistent with research on transactional distance theory (Moore, 1993) that suggests the exchanges between the instructor and learner are key to decreasing the distance felt in the online learning format and increase the potential course impact. Previous research suggests that social interaction is critical to online participation, and such interactions have been associated with learning (Richardson & Swan, 2003).

Initial evidence suggests that teachers participating in the ECI courses improve their teaching practices (Hamre, LoCasale-Crouch, & Neesen, 2014). Specifically, teachers in all three of the ECI course groups (course only, course with reflective writing, course with conferences), compared to early childhood teachers that did not receive any course intervention, made gains in the quality of their teacher-child interactions. And, in examining teachers who participated in ECI with the conference component compared to those who did not receive any course intervention, positive effects on teacher practice were nearly doubled.

Online Course Participation

Several studies have documented the correlations between online course participation and student success, in that positive outcomes were associated with more time engaged in the online content (Morris, Finnegan & Wu, 2006; Shea & Bidjerano, 2014). Noting that participation is crucial to positive outcomes of course experiences, many researchers and educators express concerns regarding the high online course dropout rates (Jaggars & Xu, 2010; Lee & Choi, 2011; Levy, 2007), consistently reported as much higher than face-to-face courses (Jaggars & Xu, 2010; Xenos, 2004). Specific to early childhood teachers, even less is known about their engagement with online courses. Thus, the field needs to understand what online course features may improve participation and if in fact early childhood teachers will use online learning, and how they use it, to consider if it is a viable option to support their development going forward.

Specifically, scholars have advocated for more research on participant characteristics associated with online learning to better understand the ongoing problem of attrition in online courses (Carr, 2000; Dupin-Bryant, 2004; Jaggars & Xu, 2010; Lee & Choi, 2011). Learner satisfaction appears to be critical. For example, Chuyung and colleagues (1998) found that 42% of those that dropped out of an online course did so due to dissatisfaction with the learning environment. Similarly, Levy (2007) found that satisfaction was the critical predictor between those staying and leaving an online course, above and beyond previously documented demographic characteristics. Given findings that satisfaction is associated with greater participation as well as higher levels of learning (Fredericksen, Pickett, Shea, Pelz, & Swan, 2000; Lee & Choi, 2011), both reports of satisfaction at the beginning as well as the end of the course could provide critical information

regarding how to get and keep learners engaged.

Additionally, research indicates individuals' feelings about technology impact their learning experience. Anxiety towards technology may cause resistance towards using technology (Gardner, Discenza & Dukes, 1993), and has been associated with decreased satisfaction with online learning experiences (Arbaugh, 2002; Arbaugh & Duray, 2002; Hong, 2002; Piccoli, Ahmad & Ives, 2001; Sun, Tsai, Finger, Chen, Y & Yeh, 2008). Learning theory, however, would suggest that some anxiety may actually enhance learning (Downer, Jamil, Maier & Pianta, 2012). Thus, some challenges that are not overwhelming may support online learning.

Last, of particular interest in this study was whether or not offering a course for credit may provide additional incentive to in-service teachers' participation. This is especially critical given the recent increase in expectations for early childhood teachers to obtain a college education (Improving Head Start for School Readiness Act of 2007). In sum, understanding what motivates students and who might be prone to less participation is important to help guide developers in providing appropriate student support services (DeTure, 2004; Halsne & Gatta, 2002) and tailoring those support systems and course delivery mechanisms to meet the needs of individual students (Habley & McClanahan, 2004).

The Current Study

The current study examined the participation variation in the two ECI online courses. Specifically, we first looked at how and when participants engaged with the ECI courses. We then explored the extent to which early childhood teachers varied in the following: (a) participation in the core course content, (b) optional discussion board, and (c) overall satisfaction with the course. Last, we examined individual characteristics that may be associated with teachers' variation.

Methods

Participants

The ECI courses were offered to early childhood teachers in three geographically diverse locations across the country. ECI-1 was offered in Fall 2012 and ECI-2 was offered in Spring 2013. Teachers were recruited through local contacts and asked to participate in both courses as well as the research study. Recruited teachers were randomized into treatment and control conditions; the present study only considers participants in the treatment condition. A total of 64 teachers comprised the ECI-1 sample.

Fourteen teachers left the course following ECI-1. Of these teachers, eight were in the conference condition, four were in the reflection condition, and two were in the course-only condition. Three teachers became ineligible for the study, nine teachers reported dropping because of the time commitment, and two reported leaving for "miscellaneous reasons." Seven

teachers who previously took ECI-1 were recruited to participate in ECI-2 and randomized to the treatment group. As a result, a total of 57 teachers comprised the ECI-2 sample.

Geographically, 41% of teachers were in suburban and rural locations throughout a Mideast state, 29% in a large Midwest city, and 29% in a large city in a west coast state. Teachers represented a diverse sample in terms of their educational and racial or ethnic backgrounds; 54.7% were Caucasian, 29.7% were Hispanic, 7.8% were African-American, 1.6% were Asian, 1.6% were multiethnic, and 3.1% reported another ethnicity. The majority of teachers (57.8%) held at least a Bachelor's degree; 14.7% held an Associate's (AA) degree, and 26.6% of teacher held less than an AA degree. Additional descriptives are presented in Table 1.

Course Procedures

Prior to the start of ECI-1, teachers were randomized into four conditions: *course only*, *reflective writing*, *conference*, and *no course*. For this study, we examine those that were assigned a treatment group. Teachers who were in the course only, reflective writing and conference groups were assigned to one of three instructors who served as the participants' main point-of-contact. All groups had access to ECI-1 and ECI-2. ECI-1 and ECI-2 each contain three modules and a total of 14 sessions, each designed to take teachers approximately 2-3 hours to complete. Each session is made up of between five to eight video-based lessons and interactive activities, readings, short quizzes, end-of-session tests, homework assignments, a midterm exam, and a final exam. In addition to the course material, reflective writing teachers receive supplementary writing prompts on how to reflect on their teaching practice specific to an individual child after each session (example prompt: "In what way do you think that the strengths and challenges you considered in this session impact your relationship with this child? How does your current relationship make you feel?"). Conference teachers, in addition to the course, have one-on-one correspondence with their instructors in the form of six telephone conferences during each course. In addition to online activities considered required, teachers also have the option to contribute to an ongoing discussion board where they can post comments, questions, or concerns to fellow participants within their instructor grouping. In addition to the course interface collecting all usage data, participants completed surveys at the beginning and end of each course. More details about measures are provided below.

Measures

Teacher Characteristics

Teacher characteristics were obtained from teachers' completion of an initial survey administered prior to the course start-date. Characteristics included age and degree attainment. In addition, teachers also responded to a series of questions that assessed their feelings about technology. Eight items on a 5-point scale (strongly disagree to strongly agree) assessed teachers' comfort with technology from the *Teachers Attitudes toward Computers Questionnaire* (Christensen & Knezek, 2009). Items included: "I think that working with technology is

enjoyable” and “technology intimidates me” (reversed). All items suggesting discomfort or lack of enjoyment were reverse coded so that higher scores mean more comfort with technology. In addition, in ECI-2, participants had the option to participate for college credit; 45.6% of teachers opted to take the course for credit and this was included as a predictor to participation.

Course Participation

Four components comprised overall course participation and satisfaction: participation in core course content, homework assignments, optional discussion board participation, and self-reported satisfaction.

Completion of Core Course Content. For each session, an overall percent of the core course content completed was captured through the web interface. Overall average completion was estimated by taking the mean of completion across each session. Two components comprised core course content: session and homework completion.

Session Completion. For each course, an overall composite was created to represent the total number of activities (excluding homework) completed by each teacher. This number was then divided by the total number activities to represent the proportion of sessions completed.

Homework Completion. Similarly, an overall composite of the number of homework assignments completed by each teacher was divided by the total number of homework assignments to represent the proportion of homework assignments completed.

Optional Discussion Board Posts. Discussion board posts represent teachers' contributions to the discussion board, which were automatically tracked on the web interface. A score represents the total number of posts each participant made throughout the course.

Satisfaction. Two measures of satisfaction were used in the present study. First, after each session, teachers responded to three items on a five-point scale intended to measure their satisfaction with the course at that point. In this study, this information was used to track how satisfaction changed over time. Second, a separate measure of satisfaction was used as an outcome measure of participation. For this measure, teachers reported their satisfaction at the conclusion of each course. More specifically, teachers responded to 37 items on a five-point scale. Example items included “this course was intellectually stimulating” and “the course experience was interesting and engaging.”

Results

Preliminary and Descriptive Analyses

Figures 1 and 2 show participants' day of the week and time of day course use. Course

participants most commonly engaged with the courses on Sunday and Mondays, and this timing coincided with when homework was due and the next content session opened (Mondays). Teachers were most likely to access the course website between the hours of 4:00 p.m. and 12:00 a.m., typically after traditional work hours, even though the schools in which they worked supported their involvement during work hours.

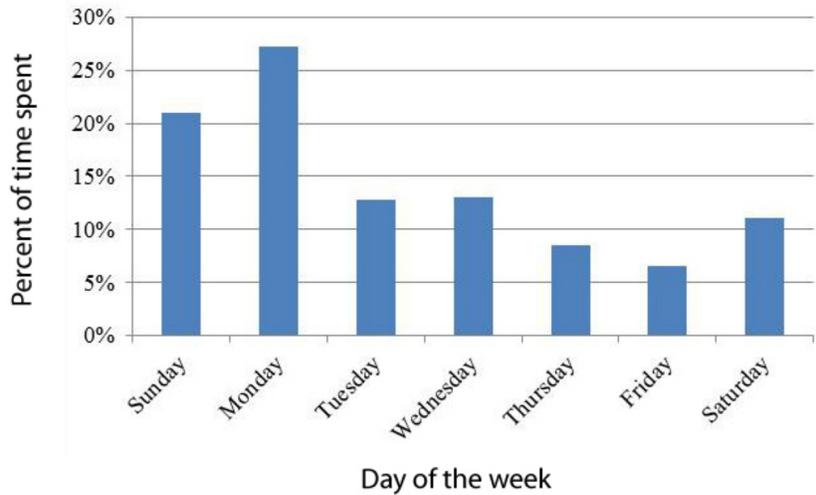


Figure 1. Course engagement by day-of-the-week for ECI-1 and ECI-2.

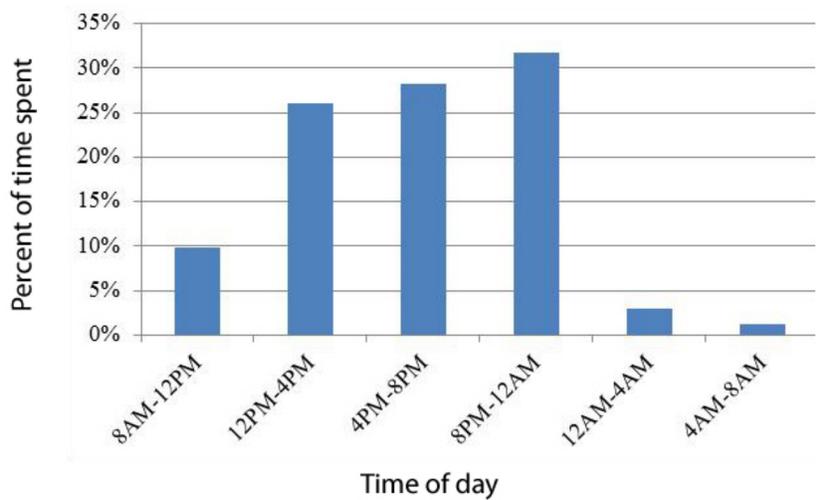


Figure 2. Course engagement by time-of-day for ECI-1 and ECI-2

Descriptive statistics for teacher characteristics and participation outcomes are presented in Table 1. Results show that the majority of the participants completed core content and occasionally posted on the discussion board. In addition, to understand how participation and enjoyment changed over the course, we examined average completion of core course content (Figure 3) and satisfaction (Figure 4) over time by session. As noted, completion of content started high (90%) early on and then decreased over time, (60% by the end of the courses). Satisfaction remained consistently high throughout both courses.

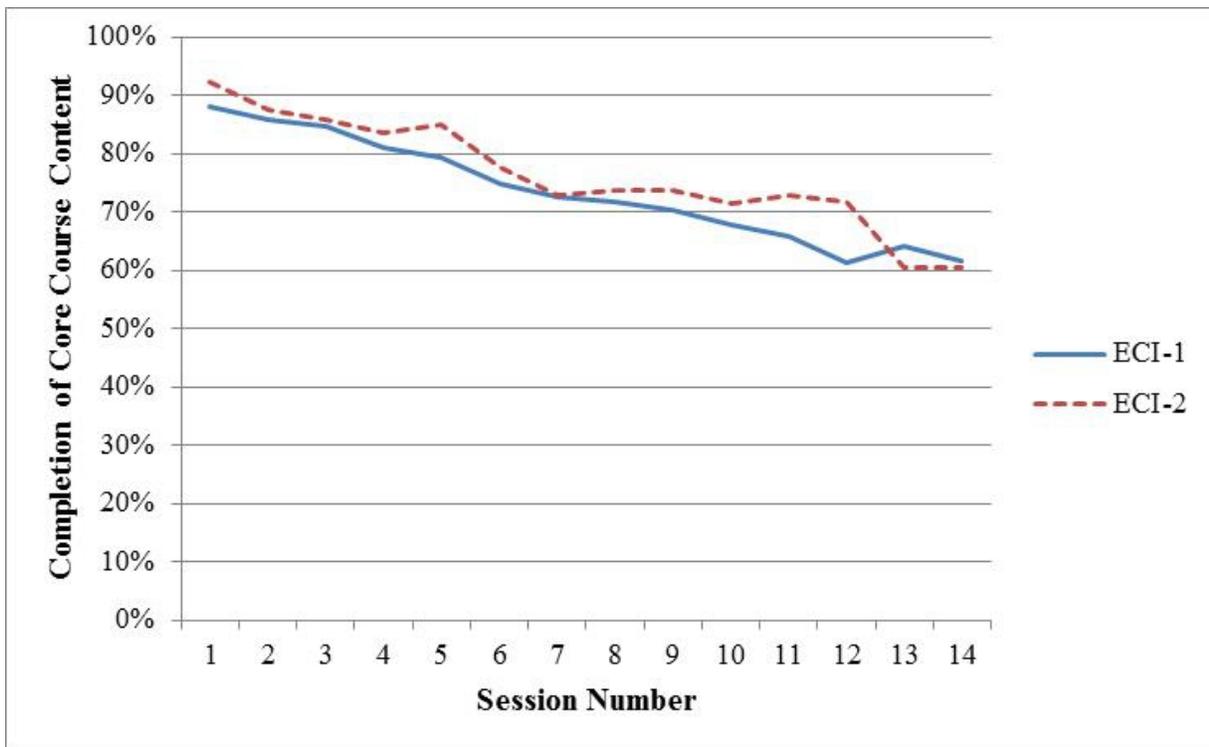


Figure 3. Average percent of core course content (a combination of session material and homework) teachers completed over time for ECI-1 (solid) and ECI-2 (dashed).

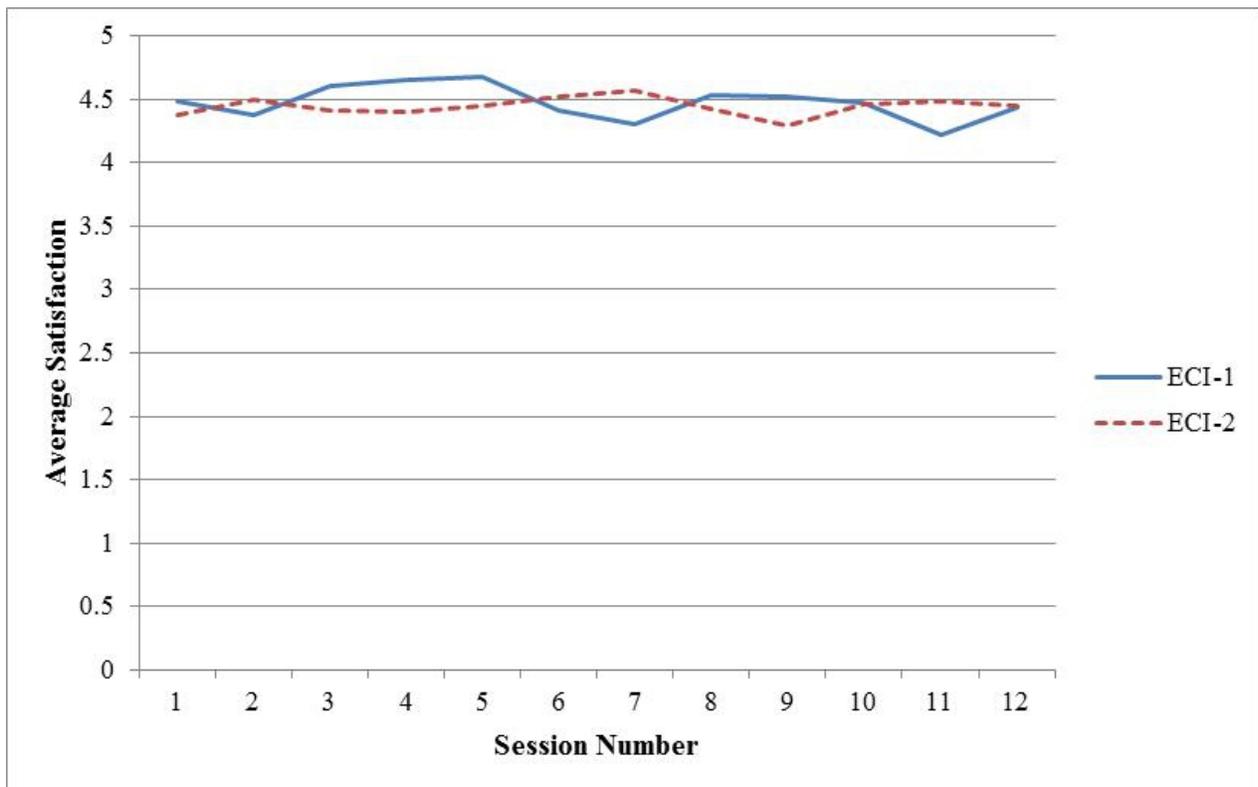


Figure 4. Average satisfaction reported by teachers over time for ECI-1 (solid) and ECI-2 (dashed).

Table 1
Descriptive Statistics

Variable	ECI-1		ECI-2	
	Range	Mean (SD)	Range	Mean (SD)
Teacher Characteristics				
Site 1	0-1	.41	0-1	.46
Site 2	0-1	.31	0-1	.28
Site 3	0-1	.28	0-1	.26
Age	22-72	37.56 (10.99)	22-72	39.10 (10.86)
Education (B.A. +)	0-1	.58	0-1	.61
Conference	0-1	.39	0-1	.37
Reflective Writing	0-1	.31	0-1	.32
Course	0-1	.30	0-1	.32
Tech Comfort	2.00-5.00	3.94 (.83)	2.00-5.00	3.83 (.85)
Credit	n/a	n/a	0-1	.46
Course Participation				
Session Completion (%)	0-100	75.59 (37.05)	0-100	78.07 (34.73)
Homework Completion (%)	0-100	66.29 (38.80)	0-100	64.91 (38.19)
Discussion Board Posts	0-24	8.58 (4.91)	0-13	7.11 (4.45)
Satisfaction	3.00-4.95	4.28 (.51)	2.65-4.97	4.38 (.54)

Note. Standard deviations (SDs) are not reported for dummy coded variables. Tech comfort = comfort with technology

Analysis Approach to Predicting Course Participation

A series of linear regressions were conducted to test the amount that course participation outcomes were explained by teacher age, education level, study condition (course, reflective writing, conference), and comfort with technology. Site was included as a covariate. In addition, whether a teacher took the course for college credit and teachers' satisfaction with ECI-1 were included as predictors in the model for ECI-2; credit was only applicable in ECI-2. Given the relatively low associations between the four outcome variables, each was run in a separate model. Analyses were conducted in Mplus version 7.11 using full maximum likelihood estimation to account for missing data. This estimation method allowed us to use all of the information available in each case, and has been identified as one of the best ways to handle missing data (Peugh & Enders, 2004). The tests of the standardized regression coefficients from these models are presented in Table 2.

Table 2
Standardized Coefficients from Models Predicting Participation

Predictor	ECI-1				ECI-2			
	Sessions Complete (%)	Homework Complete (%)	Discussion Board Posts	Satisfaction	Sessions Complete (%)	Homework Complete (%)	Discussion Board Posts	Satisfaction
Site 1	.237 (.145)	.316 (.136)*	-.013 (.134)	.429 (.146)**	.313 (.165) [†]	.176 (.168)	.136 (.165)	.241 (.191)
Site 2	.177 (.141)	.167 (.135)	-.118 (.129)	.038 (.147)	.315 (.138)*	.188 (.143)	-.116 (.143)	.239 (.140) [†]
Age	.011 (.131)	-.012 (.125)	.262 (.117)*	.222 (.141)	-.125 (.154)	-.074 (.155)	-.174 (.148)	.007 (.204)
Education (B.A.+)	.011 (.126)	-.022 (.121)	-.084 (.114)	-.261 (.125)*	.075 (.132)	.101 (.134)	.140 (.132)	.072 (.139)
Conference	-.245 (.144) [†]	-.384 (.135)**	-.488 (.126)***	.045 (.154)	.042 (.151)	-.156 (.153)	-.100 (.152)	.032 (.157)
Reflective Writing	-.198 (.138)	-.145 (.132)	-.326 (.124)**	.176 (.136)	-.068 (.143)	-.158 (.143)	-.219 (.141)	-.022 (.154)
Tech Comfort	-.239 (.123) [†]	-.233 (.119)*	-.238 (.113)*	.323 (.122)**	-.059 (.148)	-.014 (.147)	-.272 (.139)*	.186 (.135)
Credit	n/a	n/a	n/a	n/a	.424 (.120)***	.461 (.120)***	.307 (.125)*	.096 (.131)
Course 1 Satisfaction	n/a	n/a	n/a	n/a	-.179 (.177)	-.061 (.171)	.054 (.163)	.593 (.135)***
Overall R ²	.157 [†]	.225*	.299**	.350***	.260***	.226*	.242*	.552***

Note. [†] = $p < .10$; * = $p < .05$; ** = $p < .01$; *** = $p \leq .001$. Standard errors are in parentheses. Tech comfort = comfort with technology.

Participation in Core Course Content: Sessions Complete. No significant predictors emerged for the portion of sessions completed in ECI-1. Two variables approached significance, conference condition and comfort with technology. More specifically, teachers in the conference condition were marginally less likely to complete sessions as compared to teachers in the course-only condition. Additionally, teachers who reported greater comfort with technology were marginally more likely to complete fewer sessions. The overall model approached significance. For ECI-2 two variables, whether the teacher took the course for credit and site, explained a significant portion of the variance in core course participation. Credit seeking participants completed more content. The overall model was significant.

Participation in Core Course Content: Homework Complete. After controlling for all other variables, membership in the conference condition and comfort with technology were significant predictors for the portion of homework completed in ECI-1. Teachers in the conference condition were significantly less likely to complete homework as compared to teachers in the course-only condition. Additionally, teachers who reported greater comfort with technology were significantly less likely to complete homework. The overall model was significant. For ECI-2, whether the teacher took the course for credit explained a significant portion of the variance in core course participation. Teachers who took the course for credit completed more homework. The overall model was significant.

Optional Discussion Board Participation. In ECI-1, age, condition, and comfort with technology were significant predictors of discussion board posts. Older teachers posted on the discussion board more than younger teachers. In terms of condition, teachers in the conference and reflective writing conditions contributed fewer posts to the discussion board than teachers in the course-only condition. Furthermore, teachers who reported more comfort with technology posted less on the discussion board. The overall model was significant. In ECI-2, taking the course for credit and comfort with technology explained a significant portion of the variance in the number of discussion board posts. Teachers who took the course for credit were more likely to participate in the discussion board as compared to teachers who did not take the course for credit. Again, teachers who expressed more comfort with technology posted less on the discussion. The overall model was significant.

Participant Reported Satisfaction. In ECI-1, site, education level, and comfort with technology were significant predictors of satisfaction. Less educated teachers were more satisfied with the course than more educated teachers. Teachers who reported more comfort with technology were more satisfied with the course. The overall model was significant. In ECI-2, the only significant predictor of satisfaction in course 2 was satisfaction in course 1. Teachers who were more satisfied at the end of course 1 were significantly more likely to be satisfied at the end of course 2. The overall model was significant.

Discussion

This study represents one of the first in-depth explorations of early childhood teachers' participation in two innovative online courses. From this exploration, three key findings emerged. First, although early childhood teachers showed wide variation in when they accessed the online courses, their participation and satisfaction rates indicated that they actively engaged with the courses and found them useful to their practice. Second, which option of the course participants were randomly assigned to mattered for their participation. And, finally, participants' comfort with technology and motivation to complete the course related to their participation, but not always in expected ways. Taken together, these findings provide initial evidence that how online learning happens matters for participation, and may be a valuable way to provide professional development to early childhood teachers (Norris, 2010). The key findings will be explored further below.

Early Childhood Teachers' Participation in the ECI Online Courses

As noted in the scattering of online use, among this group of early childhood teachers actively working in the field, the times in which they chose to take an online course highly varied. These individualized access patterns indicate that online learning may be an avenue with enough flexibility for this group to participate in professional development more readily (Norris, 2010). Interestingly, even though the schools in which they worked agreed and supported teachers' participation, participants regularly accessed the course during the evenings and weekends. Important to note, nearly 80% of those initially enrolled persisted through both online courses. And, seen by the activity completion rates, participants engaged with and completed most of what was asked of them. These ECI completion and participation rates are higher than the in-person version of the course (LoCasale-Crouch et al., 2011) and significantly higher than other documented online course participation rates (Jaggars & Xu, 2010; Lee & Choi, 2011; Levy, 2007). Further, participants reported high rates of satisfaction, both during and after the course. The high satisfaction rates suggest that the participants found the material both interesting to engage with and highly relevant to their teaching.

Course Experience Mattered

Beyond participants' global participation and satisfaction, this study design allowed for examination of whether different types of course experiences could lead to increased participation. The differences in participation by condition provided some new information about how we think about supports for online learning. Several previous studies point to active engagement with an instructor as key to increased participation (Clay, Rowland & Packard, 2009; Park & Choi, 2009). In this study, however, participants in the course group, where they regularly engaged with the instructor, had lower completion rates of homework and activities and less posts on the discussion board. Although data is not available to answer why, two reasons may explain this. It is possible that, by regularly engaging with an empathetic and skilled instructor, participants felt less inclined to complete the online work. It is also possible that this "extra" component, though helpful for improving practice (Hamre, LoCasale-Crouch & Neesen,

2014), might have put too much demand on already busy teachers. It is also possible that participants in the course only condition, that did not regularly talk with their instructor, might have seen the discussion board as an opportunity to engage with others, perhaps providing the social support needed to actively engage in an otherwise asynchronous environment.

Individual Characteristics Associated with Course Participation

Among other associations explored, teachers' feelings about technology seemed to also play a particularly important role in participation, but not always in expected ways. Consistent with other studies, for example, higher levels of technology comfort were associated with more satisfaction with the experience (Arbaugh, 2002; Arbaugh & Duray, 2002; Hong, 2002; Piccoli et al., 2001; Sun et al., 2008). On the other hand, participants with higher levels of technology comfort also completed fewer homework assignments and posted less on the discussion board. There may be a couple of reasons for this mixed finding. First, in general the range of technology comfort in this study was high. This might be an indication that, overall, people are becoming more comfortable with technology and discomfort is less of a barrier than in previous work. Also, given that participants were voluntary, they may have had more confidence in their technology skills and thus saw this online course as a feasible option for them from the beginning. Additionally, in line with cognitive research that suggests a little discomfort may be helpful in learning (Downer et al., 2012), perhaps the minimal amount of discomfort participants reported might have provided enough tension to actively engage with but not interfere with course participation.

Finally, whether teachers were taking the course for college credit versus professional development hours related to course participation in expected ways. Interestingly, not only did taking the course for credit increase completion of required course components, but credit-seeking participants also engaged more with the optional discussion board. This might suggest something unique about this group. For example, it is possible that those who take the course for credit might have more experience with online courses. Alternatively, credit-seeking individuals may have taken the overall course more seriously as they chose to participate in activities, like the discussion board, that had no bearing on their grade or receiving of credit. Given the need for many early childhood teachers to engage in credit bearing activities (Improving Head Start for School Readiness Act of 2007), this finding points positively to credit as a legitimate incentive for professional development participation and is worth considering to reach those in need of early childhood education courses.

Limitations

Though interesting findings emerged from this study, notable limitations exist. First, the small convenience sample limits the generalizability of results. Additionally, the sample size and design limited our examination of other potentially important characteristics that might be associated with participation. For example, there might be other aspects of participants' beliefs

beyond their comfort with technology that drive their participation. Last, though examining online course participation is important, the ultimate goal of any course or other professional development intervention is to see how it relates to improved teaching practice. This, however, was beyond the scope of this study. Future work would benefit from a more comprehensive look at online course participation. Specifically, it may be valuable to investigate both the unexplored teacher and site characteristics that might be associated with participation variation, as well as how participation is associated with course outcomes.

Conclusion and Future Directions

Given the established importance of intervention participation to intended outcomes (Durlak & DuPre, 2008), these findings suggest that the structure of an online course is a key consideration when assessing the potential benefit from the experience. One future direction includes unpacking the course experience further through an internal system audit. Studies doing this kind of audit using frameworks such as Quality Matters (QualityMatters.Org) have provided additional information about what is and is not good pedagogical design versus poor quality technical implementation. Information gained from audits like this can move the field beyond whether or not online is a viable option for learning to how and why it works best. This insight can aid further design and proliferation of online experiences that have the most potential to positively impact learners.

In addition, this study also points to the importance of considering participant characteristics as the field develops and assess online courses. Importantly, even with some discomfort with the technology, early childhood teachers reported an overwhelming satisfaction with the ECI online courses. This may speak to both their willingness to engage with online courses but, perhaps more importantly, their need for professional development focused on classroom practice. And, given the increase in participation for required and non-required features simply as a result of offering the courses for credit, considering motivational structures for ongoing professional development is warranted. Thus, future studies need to expand the exploration of critical participant characteristics that might impact their engagement in, and eventual benefit from, online courses.

References

- Angus, S., & Watson, J. (2009). Does regular online testing enhance student learning in the numerical sciences? Robust evidence from a large data set. *British Journal of Educational Technology*, 40(2), 255-272. doi: 10.1111/j.1467-8535.2008.00916.x
- Arbaugh, J. B. (2002). Managing the on-line classroom: a study of technological and behavioral characteristics of web-based MBA courses. *Journal of High Technology Management Research*, 13(2), 203–223. doi: 10.1016/S1047-8310(02)00049-4
- Arbaugh, J. B., & Duray, R. (2002). Technological and structural characteristics, student learning and satisfaction with web-based courses – An exploratory study of two on-line MBA programs. *Management Learning*, 33(3), 331–347. doi: 10.1177/1350507602333003
- Association for the Study of Higher Education. (2006). Cost-efficiencies in online learning. *ASHE Higher Education Report*. 32 (1), 1-123. doi: 10.1002/aehe.3201
- Carey, R., Kleiman, G., Russell, M., Douglas, J., & Louise, J. (2008). On-line courses for math teachers: Comparing self-paced and facilitated cohort approaches. *The Journal of Technology, Learning, and Assessment*, 7(3), 1-35.
- Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *The Chronicle of Higher Education* (2000, February 11), pp. A39–A41.
- Christensen, R. W., & Knezek, G. A. (2009). Construct validity for the teachers' attitudes toward computers questionnaire. *Journal of Computing in Teacher Education*, 25(4), 143-155.
- Chyung, Y., Winiecki, D. J. & Fenner, J. A. (1998). A case study: Increase enrollment by reducing dropout rates in adult distance education. In *Proceedings of the Annual Conference on Distance Teaching & Learning*, Madison, WI: Publisher.
- Clay, M. N., Rowland, S., & Packard, A. (2009). Improving undergraduate online retention through gated advisement and redundant communication. *Journal of College Student Retention: Research, Theory and Practice*, 10(1), 93–102.
- DeTure, M. (2004). Cognitive style and self-efficacy: Predicting student success in online distance education. *The American Journal of Distance Education*, 18(1), 21–38. doi: 10.1207/s15389286ajde1801_3
- Dick, W., Carey, L., & Carey, J. O., (2001). *The systematic design of instruction* (5th ed.). New

York, NY: Addison-Wesley, Longman.

- Downer, J., Jamil, F., Maier, M., & Pianta, R. (2012). Using video-based coursework and coaching to improve teacher-child interactions: The role of basic psychological processes. In C. Howes, R. Pianta, & B. Hamre (Eds.), *Effective professional development in early childhood education* (pp. 131-155). Baltimore, MD: Brookes Publishing.
- Downer, J. T., Pianta, R. C., Burchinal, M., Field, S., Hamre, B. K., LoCasale-Crouch, J, Scott-Little, C. (2013). *Coaching and coursework focused on teacher-child interactions during language/literacy instruction: Effects on teacher beliefs, knowledge, skills, and practice*. Manuscript submitted for publication.
- Dupin-Bryant, P. A. (2004). Pre-entry variables related to retention in online distance education. *The American Journal of Distance Education*, 18(4), 199–206. doi: 10.1207/s15389286ajde1804_2
- Donohue, C., Fox, S., & Terrance, D. (2007). Early childhood educators as elearners: Engaging approaches to teaching and learning online. *Young Children*, 1(6), 34-40.
- Durlak J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41(3-4), 327-350. doi: 10.1007/s10464-008-9165-0
- Early, D., & Winton, P. (2001). Preparing the workforce: Early childhood teacher preparation at 2-and 4- year institutions of higher education. *Early Childhood Research Quarterly*, 16(3), 285-306. doi: 10.1016/S0885-2006(01)00106-5
- Fredericksen, E., Pickett, A., Shea, P., Pelz, W., & Swan, K. (2000). Student satisfaction and perceived learning with on-line courses: principles and examples from the SUNY learning network. *Journal of Asynchronous Learning Networks*, 4(2), 7–41.
- Gardner, D. G., Discenza, R., & Dukes, R. L. (1993). The Measurement of Computer Attitudes: An empirical comparison of available scales. *Journal of Educational Computing Research*, 9(4), 487–507. doi: 10.2190/DXLM-5J80-FNKH-PP2L
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education model. *The Internet and Higher Education*, 2(2-3), 87-105. doi:
- Garrison, D.R. & Arbaugh, J.B. (2007). Researching the community of inquiry framework:

- Review, issues, and future directions. *The Internet and Higher Education*, 10(3), 157-172. doi:
- Gill, W. E. (2011). *The Ready to Teach Program: A federal initiative in support of online courses for teachers*. Retrieved from <http://eric.ed.gov/?id=ED530966>
- Habley, W. R., & McClanahan, R. (2004). *What works in student retention: All survey colleges*. Iowa City, IA: American College Testing (ACT).
- Halsne, A. M., & Gatta., L. A. (2002). Online versus traditionally-delivered instruction: A descriptive study of learner characteristics in a community college setting. *Online Journal of Distance Learning Administration*, 5(1), 1–14.
- Hamre, B.K., Pianta, R.C., Burchinal, M., Field, S., LoCasale-Crouch, J., Downer, J.,...Scott-Little, C. (2012). A course on effective teacher-child interactions: Effects on teacher beliefs, knowledge, and observed practice. *American Educational Research Journal*, 49(1), 88-123. doi: 10.3102/0002831211434596
- Hamre, B., LoCasale-Crouch, J., & Neesen, K. (2014). *Can online coursework for early childhood teachers change their teaching practice?* Paper presented at American Educational Research Association, Philadelphia, PA.
- Hong, K. S. (2002). Relationships between students' and instructional variables with satisfaction and learning from a Web-based course. *Internet and Higher Education*, 5(3), 267–281. doi: 10.1016/S1096-7516(02)00105-7
- Improving Head Start for School Readiness Act of 2007, H.R. 1429, 110th Cong. (2007). Retrieved from GovTrack.us [database] <http://www.govtrack.us/congress/bill.xpd?bill=h110-1429>
- Jaggars, S. S., & Xu, D. (2010). *Online learning in the Virginia community college system*. New York, NY: Columbia University, Teachers College, Community College Research Center.
- Keller, J. M. (1987). Development and use of the ARCS model of instructional design. *Journal of instructional development*, 10(3), 2-10.
- Keller, J. M., & Kopp, T. W. (1987). Application of the ARCS model to motivational design. In C. M. Reigeluth (Ed.), *Instructional theories in action: Lessons illustrating selected theories*, 289-320. New York, NY: Lawrence Erlbaum.
- Knowles, M. (1996). Adult Learning. In R. L. Craig (Ed.), *The ASTD Training and*

- Development Handbook* (pp.253-264). New York, NY: McGraw-Hill.
- Knowles, M. S, Holton, E. F., & Swanson, R. A. (2011). *The adult learner: the definitive classic in adult education and human resource development* (7th ed.). Amsterdam, The Netherlands: Butterworth-Heinemann.
- Kurthen, H., & Smith, G. (2006). Hybrid online face-to-face teaching: When is it an efficient tool? *International Journal of Learning*, 12(5), 237-245.
- Lebec, M., & Luft, J. (2007). A mixed methods analysis of learning in online teacher professional development: A case report. *Contemporary Issues in Technology and Teacher Education*, 7(1), 554-574.
- Lee, Y., & Choi, J. (2011). A review of online course dropout research: Implications for practice and future research. *Educational Technology Research and Development*, 59(5), 593-618. doi: 10.1007/s11423-010-9177-y
- Levy, Y. (2007). Comparing dropouts and persistence in e-learning courses. *Education & Computers*, 48(2), 185-204. doi: 10.1016/j.compedu.2004.12.004
- LoCasale-Crouch, J., Kraft-Sayre, M., Pianta, R.C., Hamre, B.K., Downer, J.T., Leach, A.,... Scott-Little, C. (2011). Implementing an early childhood professional development course across 10 sites and 15 sections: Lessons learned. *NHSA Dialog*, 14(4), 275-292. doi: 10.1080/15240754.2011.617527
- Mashburn, A. J., Downer, J. T., Hamre, B. K., Justice, L. M., & Pianta, R. C. (2010). Consultation for teachers and children's language and literacy development during pre-kindergarten. *Applied Developmental Science*, 14(4), 179-196.
- Maxwell, K.L., Lim, C.-I, & Early, D. M. (2006). *Early childhood teacher preparation programs in the United States: National report*. Chapel Hill, NC: the University of North Carolina, FPG Child Development Institute.
- Mayer, R. E. (2008). Applying the science of learning: Evidence-based principles for the design of multimedia instruction. *American Psychologist*, 63(8), 760-769.
- Means, B. (2010). Technology and education change: Focus on student learning. *Journal of Research on Technology in Education*, 42(3), 285-307.
- Moore, M.G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education*. New York, NY: Routledge.

- Morris, L., Finnegan, C. & Wu, S. (2005). Tracking student behavior, persistence, and achievement in online courses. *Internet and Higher Education, 8*(3), 221-231. doi: 10.1016/j.iheduc.2005.06.009
- Norris, D.J. (2010). Raising the educational requirements for teachers in infant toddler classrooms: Implications for institutions of higher education. *Journal of Early Childhood Teacher Education, 31*(2), 146-158. doi: 10.1080/10901021003781221
- O'Dwyer, L., Carey, R., & Kleiman, G. (2007). The Louisiana algebra online initiative as a model for teacher professional development: Examining teacher experiences. *Journal of Asynchronous Learning Networks, 11*(3), 69-93.
- Park, J.-H., & Choi, H. J. (2009). Factors influencing adult learners' decision to drop out or persist in online learning. *Educational Technology & Society, 12*(4), 207–217.
- Peugh, J. L. & Enders, C. K. (2004). Missing data in educational research: A review of reporting practices and suggestions for improvement. *Review of Educational Research, 74*, 525–556. doi: 10.3102/00346543074004525.
- Pianta, R., Mashburn, A., Downer, J., Hamre, B., & Justice, L. (2008). Effects of Web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. *Early Childhood Research Quarterly, 23*(4), 431–451.
- Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skills training. *MIS Quarterly, 25*(4), 401–426. doi: 10.2307/3250989
- Rice, K. (2006). A comprehensive look at virtual education in the K-12 context. *Journal of Research on Technology in Education, 38*(4), 425-448. doi: 10.1080/15391523.2006.10782468
- Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks, 7*(1), 68-88.
- Roblyer, M., Porter, M., Bielefeldt, T., & Donaldson, M. (2009). Teaching online made me a better teacher: Studying the impact of virtual course experiences on teachers' face-to-face practice. *Journal of Computing in Teacher Education, 25*(4), 121-126. doi: 10.1080/10402454.2009.10784620
- Shea, P., & Bidjerano, T. (2014). Does online learning impede degree completion? A national study of community college students. *Computers & Education, 75*, 103-111. doi:

10.1016/j.compedu.2014.02.009

Sheldon, K. M., & Lyubomirsky, S. (2006). How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves. *The Journal of Positive Psychology, 1*(2), 73-82.

Smyth, J. M. (1998). Written emotional expression: effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology, 66*(1), 174.

Sun, P., Tsai, R.J., Finger, G., Chen, Y., Yeh, D. (2008). What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education, 50*(4), 1183-1202. doi: 10.1016/j.compedu.2006.11.007

Tallent-Runnels, M., Thomas, J., Lan, W., Cooper, S., Ahern, T., Shaw, S., & Lui, X. (2006). Teaching courses online: A review of the research. *Review of Educational Research, 76*(1), 93-135. doi: 10.3102/00346543076001093

Xenos, M. (2004). Prediction and assessment of student behavior in open and distance education in computers using Bayesian networks. *Computers & Education, 43*(4), 345–359.

