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Cover Page Footnote

My great thanks to my students, who so generously shared their thoughts, learning, and reflections during the course and allowed me to have access to all their coursework so I might continue to learn from them.

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Abstract

Due to the pandemic, undergraduate course ECE 340: Constructivist Teaching with Young Children, moved to an online, asynchronous format. The in-person methods I used, group work, in-class activities, and discussion, could not be directly transposed online as might lecture and recitation. Toward the term's end students expressed appreciation for the degree of choice they had in assignments, examples of programs in text and video, and repeated opportunities to design centers and instruction. Some declared a greater sense of confidence as educators. The comments suggested that the shift into an asynchronous provision of the course had been effective. This study is an investigation of the robustness of this response and the influence of course design on students' acquisition of constructivist teaching approaches.

Key Words: Constructivist teaching, early childhood teacher education

Constructivist Teaching in a Virtual Space

Due to the pandemic, undergraduate course ECE 340: Constructivist Teaching with Young Children, moved to an online, asynchronous format. The in-person methods I used, group work, in-class activities, and discussion, could not be directly transposed online as might lecture and recitation. Toward the term's end student work included comments that expressed appreciation for the degree of choice they had in assignments, examples of varied programs observed in video, and multiple opportunities to design centers and instruction. Some asserted that these supported a greater sense of confidence they now felt as educators. The comments, suggesting that the shift into an asynchronous provision of the course had been effective, spurred me to investigate the robustness of this response and the influence of course design on my students' acquisition of constructivist teaching approaches.

Conceptual Framework

Constructivist Teaching

Why teach prospective teachers about constructivist teaching with young children? As constructivists have taught, children's learning about the world is neither passive nor receptive. Rather, they construct their knowledge of the physical, social, and cultural world through direct interaction (Bedrova & Leong, 2007; Berk & Winsler, 1995; Bransford, Brown & Cocking, 2000; Van Hoorn, et al., 2015; Rogoff, 1990; Vygotsky, 1962, 1978). Children develop and revise theories about the world as they engage with it (Engel, 2021; Gopnik, et al., 1999). The importance of agency in engagement with one's environment is a shared focus of constructivist approaches (Eyler, 2018), seeing the learner as actively applying prior knowledge in new interactions and reflecting upon that knowledge to update it (Branscombe, et al., 2013). The educators of Reggio Emilia view children as the protagonists of their own learning (Castagnetti, 2014).

Eyler writes, "The building blocks of human learning are put into place when we are very young … The brain may mature and develop, but the ways in which we learn remain largely the same" (2018, p. 9). If learning is constructed and learners need the space to have agency in their learning, it follows that when designing a course for teacher preparation, the challenge is to not over specify the learning for students, thereby preventing their ability to build their own understandings. This also serves as a model of teaching for children, so that teacher candidates might experience this kind of learning first-hand. When the learning tasks are over-specified or closed-ended, the learner is deprived of opportunities to engage with the content in ways that allow them to construct their own knowledge. To avoid this in an in-person environment, active

learning experiences take the form of open-ended tasks in group work and class discussions engage students in ways that invite their agency as learners.

The translation from in-person to asynchronous constructivist teaching is a complex endeavor, involving the creation of online opportunities for students to interact, think critically, and construct their own knowledge (Bryant & Bates, 2015). Guided improvisation can be employed for deep learning with the following elements: 1) Learning is embodied; 2) Knowledge is externalized; and 3) Students are intrinsically motivated (Sawyer, 2019, p. 69). It follows that constructivist teaching, even in an online asynchronous mode, would provide choices to support intrinsic motivation, and address how people construct knowledge by: investigation and exploration, representation of thinking, and reflection (Bickart, et al., 1999).

The Current Study

Teaching adults to teach by modeling teaching for young children is easier to do face-to-face, with active and playful group learning experiences. I was certain of what I had created for the course or that it provided effective modeling. Still at the term's end, online reflections and course evaluations indicated that the course structure had been beneficial. It seemed I had been teaching in a constructivist manner in a virtual asynchronous format.

Systematic analysis of coursework was needed to determine the robustness of this impression, and to understand more about students' perspectives. I aimed to investigate the process through tracing students' work to see how the learning experiences created for the course built to the final project, reflections, and evaluations. This study reports on the research question: *How did the design of an online course on constructivist teaching contribute to these students' learning about constructivist teaching with young children?*

Methods

Course Description

In-Person Version. The 14-week in-person course had been divided into two sections. The first 4-6 weeks focused on classroom structure and environment, culminating in a Design a Program project typically created individually or in pairs, in which students described the physical design of a program and envisioned a schedule and structure for its functioning. During the second section of the course, while the content focused on domains of development and addressing those in instruction, small groups formed working teams to develop a Long-Term Study. In this second section of the course some class time at every meeting was devoted to in-person group work on the study. In this project students were tasked with choosing a topic for the long-term study, selecting the learning goals, and designing how they would engage children in a study of the topic. Part I of the project consisted of an overview including the topic, learning goals, and a rationale. They also created a representation of the long term study they envisioned, with learning activity ideas listed in a web, table, outline, or some other graphic form. In Part II of the assignment, students fully developed four activity plans, provided one activity to children, and reported on the provision of that activity with reflection and evaluation. There was opportunity to revise and add to the study plans as the term progressed. Teams received feedback on Part I before creating Part II, and there was another opportunity for response and revision to the whole project before the submitting the completed version (Dorfman, 2008).

Asynchronous – Changes Made. Since the in-person course could not be replicated simply (Bryant & Bates, 2015), among the changes needed in the shift online was a revision of the assignments and weekly work to suit the different instructional mode. A weekly module structure was developed that included the ordered sections: Overview, Read, Explore, Do. The

Overview oriented and introduced students to the topic and goals for the week. Read listed the readings from course books and/or included links to required and supplemental readings. Explore linked varied resources: websites to peruse, videos to watch, and articles or additional readings. Do contained reflection questions and connections forums based on the readings and explore activities, and asked students to draw connections between the Read and Explore elements and to reflect upon their relationship to one another. These were at times interactive and other times solo submission, intended to accomplish the purposes of in-class meetings to provide opportunities for students to process and apply what they were learning. The Do section also included any graded assignments due that week.

Instead of the two large assignments described in the in-person version, I decided to distribute the work into more frequent smaller assignments, nine Design and Planning Projects. In each project students designed a classroom element, the schedule and/or rules, rituals, or procedures; or the *physical design* of an area or center, related to the content of the readings for the week, often a developmental domain, and an *activity plan* addressing the domain or topic of the week's reading. The assignments were open-ended with reflections and choices built in. Students could choose the age/s of the children, area to design, activity to plan, its structure as child- or teacher-initiated, small group, or large group, etc., and if it would occur in their designed center or elsewhere.

In addition, rather than create a full long-term study, the final project was to envision a long-term study of a topic of their choice and describe in detail one day within it, including a schedule and ideas for activity plans that would address the topic that day. This assignment was also intentionally open-ended, allowing for author choice of age-level, topic to be studied,

content, and organization. Reflections related this project to course content and asked what students would take away into their practice.

Participants and Recruitment

I contacted the students in the section and requested their consent to analyze and quote from their coursework anonymously. All 16 students gave their permission. The only risk to the students was a threat to confidentiality, which I minimized by ensuring no work or students are identified by name or other descriptive or identifiable markers. The students were female undergraduates, with minimal to several years of experience teaching preschool. All names included are pseudonyms.

Data Collection

Student work from all course assignments comprised the data for this study. The weekly Read & Explore reflection questions and forums, the nine Design and Planning projects, and the final Long Term Study Planning and Reflection are summarized in Table 1, below. Each student's work was downloaded, anonymized, and assigned a pseudonym prior to analysis, to avoid associating the writing with any specific individual. I created a file for each student's collected work using their pseudonym, noting what I knew of their practical experience.

Assignments	Number from each student
Weekly Do work: Reflection Questions Discussions Shared Documents: Slides, Jamboard & a Table	**12**
Design & Planning Projects	**9**
Long Term Study Planning & Reflection	**1**

Table 1. Data Sources

Data Analysis

The analysis can be described best as modified Thematic Analysis (Braun & Clarke, 2006; 2013). The data was coursework that was not designed for research purposes, so this might be viewed as secondary data analysis and could not proceed precisely as the authors describe. I focused on the content of the work and the choices students made, with emphasis on the reflection question responses in weekly work, Design & Planning projects, and Long-Term Study Planning & Reflection.

Since all students provided consent, and all had submitted all work, the data files were complete and there was no missing data. The assignments that students created during the course, including their reflections connecting readings to explore resources and the assignments with the reflections, I deemed reliable data sources as they were developed for coursework during the process. This is in contrast to the course evaluations which were collected in anonymous surveys after the course. Therefore, I used the course evaluation comments to develop the initial categories for the analysis, but did not use the evaluations themselves as data, since they were retrospective.

Process. Analysis began with an a priori set of categories suggested by the comments in course evaluations and final projects. The analytical categories, a priori and newly identified, can be found in Table 2. Analysis of each student's profile proceeded individually. As categories were inductively added, I went back to profiles already created and reviewed them for those new categories.

Category	**Choice**	**Flexibility**	**Inclusion**	**Vision**	**Confidence***	**Modeling***
Description	How much choice are children provided in designs, schedules, and plans?	Expectations of children, activity plans allowing for open-endedness & children's inputs	Extent to which designs & plans were inclusive of different children	**Imagination:** envisioning what kind of teacher they want to be, classroom they want to have, etc.	Comments on sense of increased confidence in self as teacher	How models in Explore provided ideas and inspired new ideas. Comments about choice in readings & assignments
Category	**New Ideas**	**Class Design***	**Planning***	**Planning Template**	**Course Texts***	**Professional Dev./Practice**
Description	Mentions of something not thought of before	Elements of class design learned from readings, explore resources, and design projects	Learning how to plan: readings, explore resources, attributions to repeated practice	Explicit mention of the textbook planning outline or template.	Explicit references & attributions to readings & resources (Read & Explore)	What I will take into my practice (even tomorrow) or already have

Table 2. Analytical Categories: ***** *The a priori categories.*

Themes. An analysis across the whole sample followed. I began by color coding the quotes and created a comprehensive matrix table organized by category with all students' data within each category. With an interpretive approach I engaged in part-whole analysis, to see each of the parts in light of the whole (how individual responses compared to one another), and the whole group in light of the parts (patterns of response across categories). Rereading each of the categories across all the individual students gave rise to some stable findings, organized as themes, derived from patterns of response across the different analytical categories (see Table 3).

Theme	Analytical Categories	Examples
Modeling	Modeling (course structure and explore resources); Course texts; Planning; Design; Planning template	Isabel, Project #4: "I always say that if you gave students a choice on what materials they wanted to use, they made cooler art …"
Plans Can Be Written for Child-chosen, Child-led Activities	Modeling; course structure	Ingrid Project # 3: "I also learned that activity plans can be created for choice time activities. I thought typical plans were meant to be teacher-led activities."
Opportunity/Repeated Practice	Modeling; course structure	Georgia, Long-Term Study: "Throughout this course, I had the opportunity to develop my own classroom. All the ins and outs of the classroom, from the physical setup to the learning environment. I very much enjoyed having this opportunity to practice before I have a classroom of my own."
Imagination, Confidence	Confidence; New ideas; Professional Development/Practice	Janaya, Long-Term Study: "I am thankful for all of the independence that was given to create our projects throughout the semester, for I am now more confident in helping children in my future profession."
Providing Choice/ Stepping Back and Letting Children Lead	Choice; Flexibility; Professional Development/Practice, Course texts Planning, New ideas	Denaia, Project #6: "I took this to heart because I tend to provide an answer or correct children's thinking. I need to know when to correct and when to let them figure things out and to allow them space, especially when they're very upset."

Table 3. Themes & Derivations

Results & Discussion

Modeling

The first theme consists of examples of insights and ideas developed from Read and Explore resources: from High Quality Learning, Boulder Journey School, other videos, and additional articles provided for readings. With these materials I aimed to provide the students with examples of practice that embodied the principles and ideas discussed in the main texts for the course: *Developmentally Appropriate Curriculum* (DAC; Kostelnik, et.al., 2019) and *Cultivating Curiosity in K-12 Classrooms* (Ostroff, 2016). In this way the course modeled

teaching practice with young children. In the weekly reflections students were asked to apply the content, connect Explore resources to course texts, and discuss how they supported or differed from one another. Students cited specific sections of text, videos, and resources as providing learning and new ideas throughout the term. Ingrid summarized the appreciation of the teaching models provided when she wrote: "I love hearing about fellow teachers' success stories through their teaching journey."

Students also made references to learning from their peers, from discussion forums or other shared work. For example, when we focused on the Language Domain, students were asked to jointly populate a table in our class drive with ideas for bringing language and literacy activities to children in all areas of a typical preschool classroom, including the sensory table, dramatic play, construction, outdoors, etc. In Project 7 Katy wrote, "The grid activity was one of my favorite activities this week. It was amazing to see just how many ideas we came up with to integrate literacy into every possible aspect of the classroom. It was also nice to see what happens when teachers come together and brainstorm ideas. There were many ideas placed into the grid that I have never heard of before."

Students also responded to the degree of choice provided to them in all activities. For example, I often provided several additional readings and/or resources with the instruction to choose one. In their projects, students were given the choice of age/s of children, center they wanted to design, and activity plan they would develop and its structure, a choice time activity in the center they designed or in another part of the classroom, or a small or large group activity that might be either child-chosen and child-led, or teacher-led, possibly assigned. For example, in Week 11 Iris wrote: "… the Design Plans we've been doing are helping me gain more ideas for how my classroom will look and run."

Plans Can Be Written for Child-Chosen and Child-Led Activities

Design and Planning Project 1 was the simplest, and consisted of designing a dramatic play area. Project 2, still preliminary, asked students to develop a daily schedule and design a classroom routine or ritual, playfully introduced to children. For example, in transition from meeting into choice time: hand each child a block as a pretend phone and ask them to call someone to tell where they plan to play first.

From Project 3 and on, the assignment requested the physical design of an area of the classroom and an activity plan related to the developmental domain or focus of the week's readings, using the template provided in DAC (Kostelnik, 2019, p. 85). In all projects I asked students to reflect on what they learned from the project and what they will take away into their practice. From Project 6 and on I included a reflection question connecting the project to that week's readings and Explore activities explicitly.

In each project the assignment instructions included the sentence: "A teacher needn't be leading the activity to write activity plans for it." Many students listed this as a major takeaway from an assignment. Although this statement appeared first in Project 3, surprisingly, references to this as the student's major learning appeared for different people at different times. Some noted this in Week 3 upon its first appearance, as did Ingrid (Table 2). Deborah reported learning in Project #4, that "even though you create an activity plan, it does not necessarily have to be teacher controlled. The plan can serve as an outline of what you expect the children to do when presented with a specific activity." Others reported this learning in Project 5, 7, even 9 and expressed this learning differently. In Project #8 Georgia wrote, "This project, like many of the others, has shown me that even though the teacher is not involved in the activity, nor is it

scripted, it is still considered a part of the social learning domain and is a great tool for students to use to nurture their development."

The importance of this learning is what it indicates about the student's understanding of play based-learning and intentional teaching. If a teacher knows what they intend, and what learning they might expect to witness when they provide materials and time for children to engage with them, they are more prepared to notice the learning that occurs in these play and choice times. Additionally, when teachers then observe what children do, they can more readily extend the learning delicately, without interrupting or disrupting the children's play, for example emphasizing vocabulary intentionally, posing a well-timed question, or providing an additional material. Documenting the learning they notice in children's activities and behaviors, language and communication, process and creations is also facilitated. It is important for students to understand how purposeful children's choice time and free-play activity really is so that they will plan for playful learning. When they realize that they can write formal plans for these activities, these new teachers can embrace free play and choice as an intentional part of their curriculum and can more readily notice when learning occurs. This is inherently constructivist teaching.

Opportunity/Repeated Practice

Students commented that the repeated practice of designing the physical space and planning a learning activity or experience was a rich source of learning. For most, their experience had been as assistant teachers or observing for fieldwork. In Project 7 Donna wrote, "As always, creating the center and the activity plan is great practice for my student teaching … this fall." In her Long-Term Study Deborah echoed, "By completing the many different activity plans, I have learned a lot about myself and how I want to be as a teacher. I want my students to enjoy the different work and learning that must occur within the classroom and to do so, I must

create the right environment." Zoe, an experienced preschool lead teacher, summarized, "I found our designing and planning projects each week to be beneficial when considering what I can do to offer quality care and be intentional about how I design our space and time together."

Imagination, Confidence

The opportunity to envision their own classroom and to think through the physical space and design, the structure of the day (schedule), and plan curriculum repeatedly was empowering to students. A few reported that having this experience in a course gave them confidence as they go out to develop their own classroom environments and teach children within them. A more experienced associate preschool teacher, Ingrid (see Table 2), found the content in texts and resources affirming of her knowledge, and in Project 6 said, "I have always thought myself to lack in the math and science areas of the classroom. However, after reading the text, I realize that I incorporate math and science into my classroom much more than I thought throughout our daily schedule." Donna wrote, "I'm thankful for all of the independence that was given to create our projects throughout the semester, for I am now more confident in helping children in my future profession." Zoe wrote: "I feel confident in being able to create a space where the children can take the lead."

Providing Choice/Stepping Back and Letting Children Lead

As I began to read the profiles using the a priori categories, I noticed that the degree of choice that students built into their designs and activity plans varied. While some students embedded choice from the beginning, others did not, and the degree of choice afforded to children varied over time. I added the category "Choice" to investigate this more closely. After conducting the individual analysis, the cross-group analysis showed that the degree of choice provided to children increased over time.

An interesting division across the group became apparent, along the line of years of classroom experience. Students with less work experience built less choice for children into their plans at the beginning of the course. Their plans in later projects showed more choices offered to children, in increasingly open-ended activity plans, often written for choice time activities, not whole group activities or teacher-led lessons, and all but one included choice time/s in the daily schedule in their long-term study. In Project 2 Donna had not included choice in the schedule she created for a second-grade classroom. In week 4 she wrote, "Everyone approaches the world differently, children are simply figuring their way on how to take on the world. … That is why it is important to know that there is no best way to learn." From Project 4 on, Donna included increasingly more choice and shared direction of the activities.

Students with more extensive classroom experience included choice opportunities routinely from the beginning. In this group, growth trended toward increasing flexibility over time. In Project 6 Jackie, a three-year associate preschool teacher wrote, "I have learned that I need to be way more observant in my classroom so that I can learn to make connections to what students are interested in and become more involved in what they are doing and what the reason may be." As the term went on, these more experienced students reflected on allowing the children to lead, being able to follow the children, and stepping back and letting the children's interests guide where the learning would go. For example, Zoe, responded to the ideas in *Cultivating Curiosity* (Ostroff, 2016):

> … [C]hildren need opportunities to explore in an unstructured way ... This technique allows me to be able to sit back, watch them play, and observe and wonder what they are doing and thinking. … Ostroff influenced me to

> think about how I could create a space that allows children to create new ideas and take the lead.
>
> [Long-Term Study]

Denaia, a comparatively experienced infant-toddler associate teacher (see Table 2), applied her learning at work and she shared this story:

> I indirectly helped a couple of children put on their socks. It was progress from directly helping them. I failed to realize that they just wanted me to put on the sock even after constant demonstrations and eventually putting on the socks for them. … These last couple of weeks I've decided to let them struggle through and give them space. The children now can put on both socks with no help.
>
> [Design & Planning Project # 6]

Only one student with little classroom experience did not fit this pattern. Isabel did not provide choice in her plans at the beginning of the term and added very little choice in later projects. Her plans continued to be for teacher-directed activities and the learning experiences she planned remained surprisingly closed-ended throughout. In her final project she wrote, "I would love to also have a free choice Friday for when they deserve a class break for good behavior" -- a statement that indicated to me that although she was beginning to make room for a choice time, as opposed to most of her peers in the course, Isabel had not internalized much of what the class had been reading and viewing through the course.

Conclusions

Limitations

This is a study of one section of a course during the first term after the shift to asynchronous online learning. The sample is limited in size and specific, so the conclusions cannot be generalized to a broader population. When a class includes students with different practical experience and varied scholastic aptitude, the stronger members' contributions can build momentum and influence or raise the level of discussion and learning for all participants. While I cannot claim that the design alone was responsible for all the learning observed, the analysis does seem to indicate some trends across the class that attest to the supportive influence of course design.

Revisiting the Research Question

How did the design of an online course on constructivist teaching contribute to these students' learning about constructivist teaching with young children?

Student responses to the materials and the assignments provided indicate that they found the repeated practice helpful, facilitated their imagining what kind of teachers they wanted to be, and built confidence. They learned the importance of choice and developed understanding of the purposeful learning and intentional teaching that can happen through play.

The structural elements that were built into the virtual course were choice, open-ended assignments, repeated practice, opportunities for investigation, representation of thinking, and reflection (Bickart, et al., 1999) that are elements of constructing knowledge. The consistent provision of learning opportunities was deeply coherent with all the readings and resources, and created a powerful learning environment for students, that reinforced and nurtured constructivist teaching with young children. In designing all coursework, I intentionally embedded elements of

constructivist teaching as you might in teaching young children. Believing that students would take up the learning and make it their own, I provided opportunities to make choices in intrinsically motivated guided improvisation, learning was embodied in exploration and examples, they externalized their knowledge by designing spaces and instruction, and reflecting upon their coursework (Sawyer, 2019). The analysis presented shows that this design influenced student learning positively.

Frankly, I was surprised by this outcome. Before attempting to teach this course, I would have assumed that the challenge of modeling teaching for young children in the context of an online asynchronous college course was insurmountable. It would be interesting to investigate whether this course, taught again with this same structure but in person, would result in similar student responses reflecting the same themes. Additionally, it would also be interesting to study the result if repeated with other students or on a larger scale, to see if the effect of course structure would be consistent with this study. The experience of teaching the course and then analyzing the results for this study has reinforced my belief in constructivist teaching. I have since taught other courses in which I have embedded the constructivist practice of basing course discussions on student questions rather than my own, with great success in student engagement and deep discussions. I wonder if I would have been open to trying this practice without this prior experience. In reflection of this learning, I leave the discussion of this study to one of my students to have the last word.

In her final project, Rhianna summarized the effectiveness of the ways course design modeled constructivist teaching for young children when, if you change the word ‘children’ to ‘students,’ she wrote: “… [If] you have a little faith in the children and their exploration, they

can learn to take risks and explore. … Here direct instruction isn't the norm; it is allowing them to create their own learning path with the tools given."

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