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A classroom at home: children and the lived world of MOOCs

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This research asks "What is it like for a K-12 school-age child to learn in a massive open online course (MOOC)?" Evidence suggested that a significant number of children are participating in MOOCs either independently or alongside their parents, both inside and outside the K-12 school system. Researchers have expressed concerns regarding how these self-directed, massive learning environments may alter children's study patterns and habits. However, little scholarly attention has been devoted to this unique phenomenon. In particular, rigorous qualitative inquiry is needed to undercover the complex realities of children's actual experiences in MOOCs. Following the methodological approach "phenomenology of practice," our study analyzed lived experience descriptions (LEDs) gathered during interviews with 12 children–parent couplets; each child had completed at least one MOOC including Coursera's *Dino 101*. This article highlights several themes that arose in our existential analyses of the collected LEDs.

Keywords: MOOCs; phenomenology; children; learning experience

Introduction

> My dad found out about Dino 101 and asked if I was interested in taking it. He told me about all of the quizzes and work required since it's an undergraduate level course. He said I could learn under his account if I wanted. We looked at the intro together. I'm a huge fan of paleontology so I decided to take it. When I first signed in, it said that others can't help you because it's a thing you do by yourself and it doesn't want you to cheat. I made my promise that I wouldn't cheat. I would finish the course by myself. And I did. (Rex, eight years old) [1]

An eight-year-old schoolgirl describes her decision to take Coursera's *Dino 101*, a massive open online course (MOOC) about dinosaur paleontology. Reflecting on this recollection, adults will be hard pressed to find a similar educational event from their own childhood years. Instead, we might recall a desk-filled classroom with a teacher and similarly aged, culturally homogenous peers, engaged in a dinosaur unit – books, dioramas, and perhaps some fossils to examine. Or maybe we had adventurous parents who took us on a camping trip in the Badlands one summer, and visited a dinosaur museum. Alternatively, some of us may have memories of taking an online class in school; yet rarely would such a recollection be associated with one's early or elementary school years. And although some of us may have taken a

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MOOC or two in recent years, none will have done so as a child. So we must ask: what is this online learning experience for children? What is it like for a child to learn alongside tens of thousands of adults hailing from a diverse range of socio-economic, cultural, language, and educational backgrounds, in a university-level courses?

This exploratory qualitative research project gathered and analyzed children's everyday experiences of learning in a MOOC. The question of children and MOOCs surfaced in the context of another study investigating the learning experiences of university credit and non-credit students in Coursera's *Dino 101: Dinosaur Paleobiology*, the University of Alberta's first MOOC. In response to a MOOC-wide invitation to participate in the research project, we, the research team, were unexpectedly contacted by several parents asking if their child could be interviewed. We declined as we had only anticipated adult participants in our human research ethics application. In reviewing the literature again, we realized that children are participating in MOOCs in significant numbers (see Atkeson, 2014; Guo & Reinecke, 2014), yet the phenomenon has received comparatively little scholarly attention. This lack of attention might be also due to some MOOC platforms' restriction on minimum age (for instance, to register as a Coursera learner one has to choose his or her birth year as before 1999); hence, it is possible that students' self-reported age as shown in demographics survey does not precisely reflect their actual age. Realizing the significance of this study, the following academic term, we sought an amended ethics approval. After the second offering of *Dino 101*, we solicited children to participate in the research companied by their parents. The overriding research question guiding this study is as follows: "What is it like for a K-12 school-age child to learn in a MOOC?"

Current literature

Emerging concerns on children taking MOOCs

Most MOOC research has been focused almost exclusively on postsecondary education. Prior to 2013, there was no mention of children and MOOCs in the literature. To date, limited research has been published on the phenomenon of K-12 school-age children enrolling in MOOCs. Nonetheless, there is evidence that children are participating in MOOCs. For instance, a 2014 study of four edX MOOCs noted that 13% of the 140,546 students enrolled were under the age of 20, including some participants under the age of 10 (Guo & Reinecke, 2014). Later in September, edX acknowledged that high schoolers already account for nearly 150,000 of the three million students enrolled in its courses (Atkeson, 2014). Anecdotal evidence suggests that students taking MOOCs do so for several possible reasons: as part of existing K-12 classes, as preparation for college, for general interest, or as part of a homeschool curriculum (Bernstein, 2013; Blow, 2013; Bock & O'Dea, 2013; Davis, 2013; Jackson, 2013; Locke, 2013; Zheng, Rosson, Shih, & Carroll, 2015).

With relative acceptance of MOOCs in higher education, there is debate about using MOOCs in K-12 education. EdX released 26 MOOCs covering AP, high school, and college level material (Atkeson, 2014). Some school districts have collaborated with MOOC providers to formally incorporate MOOCs into secondary education (Jackson, 2013; Stoltzfus, Scragg, & Tressler, 2015; Young, 2013). Proponents argue that MOOCs will allow districts to offer a wider range of courses and

supplement advanced-placement courses; let teachers to draw on expert-created content, as well as flip their classrooms more easily; and enable students to get used to college level class, explore more career options, earn extra credit, and work at their own pace (Davis, 2013; Jackson, 2013; Locke, 2013; Shaw, 2013; Stoltzfus et al., 2015).

Although much of the K-12 MOOC programming is still in the pilot stages, significant issues have already arisen. MOOCs' very low completion rates are unacceptable for K-12 education (Bock & O'Dea, 2013), and early results of credit-courses suggest that successful students tend to be those who were already highly motivated (Ferdig, 2013). K-12 MOOCs, like their higher education counterparts, tend to lack of human interaction (Ferdig, 2013); this is considered problematic because peer-interaction has been demonstrated to improve students' chances of success (Breslow et al., 2013), and teacher's engagement seems core element for student's achievement (Borup & Graham, 2014). Major MOOC provider such as edX has questioned if traditional lecture format is suitable in K-12 context (Atkeson, 2014). Further, due to technical limitations, many schools that offer high school credit for MOOCs can only do so on a pass/fail basis because teachers are unable to directly monitor student performance (Jackson, 2013; Shaw, 2013). These issues, however, are primarily seen as technical (and thus ultimately resolvable) rather than pedagogical in nature.

Questioning children's MOOC experience

Given the self-directed structure of MOOCs, one important question concerns how these environments may alter children's study patterns and habits. An early study of students' navigation patterns shows that children and youth engage MOOCs differently than their older peers. Specifically, when compared to students aged 40+, students under the age of 20 were found to have a more linear navigation pattern (visiting and repeating fewer lecture sequences) and preferred assessment-to-lecture backjumps over lecture-to-lecture backjumps (Guo & Reinecke, 2014). Further, a survey of 80 students involved in the first Italian high school-specific MOOC found 32% of students reported using the videos while studying and that some parents admitted to watching the videos (Canessa & Pisani, 2013). In a follow-up survey, students further reported the ability to watch videos multiple times improved their studying and decreased the time spent on homework (Canessa & Pisani, 2013). How well and what minors learn from MOOCs, however, is still under debate (Blow, 2013). While the Italian researchers found that participating students, on average, performed better on assessments than their non-MOOC peers, they acknowledge a strong possibility of bias in this result (Canessa & Pisani, 2013). Further, a study of edX's first higher education MOOC revealed there to be no correlational between student age – any age – and achievement (Breslow et al., 2013). However, to date, there are no methodically rigorous qualitative studies addressing the complex everyday reality of children's actual experiences in MOOCs. Our study intends to shed early light on this unique phenomenon.

Methodology

In order to uncover the complexity of children's MOOC learning experience, this research adopted a qualitative research methodology "phenomenology of practice"

(van Manen, 2014). Phenomenology of practice aims to understand and articulate a human experience or a phenomenon in order to cultivate "practical insights, communicative thoughtfulness, and ethical sensitivities"(Adams, Yin, Vargas Madriz, & Mullen, 2014, p. 207) in professional educational practice. This method takes roots in continental philosophy that requires researchers suspend their naturalistic consciousness and taken-for-granted attitude (Husserl, 1999) in order to draw near to the experience as we live through it rather than how we may conceptualize, analyze, and reflect on it afterward.

Phenomenology of practice also utilizes human science methods such as interview, observation, and/or written accounts to collect participants lived experience about a specific experience or event. Lived experience refers to "our immediate, prereflective consciousness of life" (van Manen, 1990, p. 35). The researchers ask participants to recall specific instances happening, at here, while learning in a MOOC. Once descriptions of direct experience are sought, phenomenological researchers then reflect on the variant and invariant meaning of a given experience (van Manen, 1990). The goal of phenomenological study was neither to understand particular individual's experience per se, nor to generalize a universal meaning structure that can "suit" or "explain" everyone's experience. "Rather, phenomenology aims to explore and understand a 'possible' human experience, phenomenon, or event" (van Manen, 2014, p. 256).

As the meaning of human experience is embedded in and has to be expressed through language, unlike quantitative and many other qualitative studies, a phenomenological research is ultimately a writing project. The validity of a phenomenological research, therefore, depends on its experiential quality, depth of reflection, and evocative language. As van Manen (2014) summarizes the criterion to evaluate a phenomenological study: (1) Does it generate a wondering questioning in the reader? (2) Is it descriptively rich? (3) Does it offer unique insights into the experience? (4) Does it constantly question its conclusions? (5) Does it evoke an embodied response? (6) Does the reader recognize him or herself in the text? (7) Does it generate an epiphany or unique insight? (pp. 355–356).

Data collection and analysis

This study generated data via in-depth phenomenological interviews with 12 children–parent couplets from across the world.[2] The interviews were conducted by online video communication software, primarily via Skype, and ranged from one hour to 1.5 h in length. Participants were solicited via "An Invitation to Participate in a Research Project" letter distributed by an email to all *Dino 101* students and directed to parents. To participate, the child needed to be under 18 years old and to have successfully completed all the quizzes in *Dino 101*. The phenomenological interviews involved assisting the child recollect, in lived-through detail, everyday moments as well as surprising occurrences that transpired while learning in a MOOC. Parents were invited to coparticipate in this research together with their child in order to help with picturing the background of their child's MOOC experience and supplementing with vivid description to the child's description. Sample questions include "Think back to taking *Dino 101*. Do you recall a particular moment or moments that surprised or even annoyed you? Can you tell me more about it?" An interview protocol was used, but the flow of each interview varied depending on the specific moments recollected by the child and parent.

Each interview was transcribed and culled for lived experience descriptions (LEDs). An LED is a recollection of moment, event, or situation from the participant that occurred in the context of a MOOC and specifically excludes his or her opinions or generalizations about their experience. Phenomenological analysis was subsequently conducted on the LEDs via the application of multiple heuristics including thematic, existential, and eidetic reflection (van Manen, 2014). Existential reflection aims to tease out the lived dimensions of such descriptions: lived time, lived body, lived space, and lived things. For instance, the dimension of lived relation will assist researcher to closely examine the felt relationality in a given MOOC moment, between the child, parent, the MOOC instructor, and other people. Lived relation may demonstrate in the moment when someone physically absent but felt as present. Eidetic analysis involves comparing children's MOOC learning experience with other related but different experience: such as taking other forms of online class, face-to-face class, movie watching, and video game playing. We may also compare children's MOOC learning experience with adult learners' experience as revealed in our earlier study (Adams et al., 2014). Thematic analysis aims to underline the possible meanings structure of this particular human experience – again, not to generalize, but to provide possible insights to understand the inexhaustible meanings of children's MOOC experience.

Findings

In this article, we present five most distinctive, unique thematized "snapshots" of the world of MOOCs from a child's perspective, followed by a disciplined reflection on the meaning dimensions of these recollected moments.

The MOOC video lecture may appear to the child as meaningful but devoid of relational significance

Many MOOCs adopt some forms of video lecture as the major delivering tool. An earlier phenomenological study on adult learners' experience of MOOCs (Adams et al., 2014) discovered that adult learners may experience an intimate sense of tutorial sphere developing with their instructor despite the MOOCs' large-scale and supposedly impersonal delivery mode. As one xMOOC student put it: It was as if the instructor was "speaking directly to me" (Adams et al., 2014, p. 209) while in a prerecorded video lecture. However, a child student, the sense of teacher relationship or even presence may be not as potent and meaningful.

> To start with, the MOOC was both amazing and confusing. I was excited to see how in-depth the subject was. But the pre-recorded lectures confused me. I was used to the homeschool online classroom where the teacher talked to me through microphone; but in this course, the instructor on the screen can answer any questions. There were a couple of words that I ended up looking up for the meaning on my own. After the first video lecture, I started only paying attention on the content. I paid no attention on the persons or the scenes of the videos. The way the video looks to me is it is always on a green screen – very flat. (Douglas, ten years old)

While adult MOOC learners may still seek some relational semblance of a perhaps nostalgic face-to-face classroom situation, a homeschooled child may be already accustomed to a video screen version of his teacher online, where a one-on-one tutorial lesson takes place through direct conversation. In a MOOC, a child's anticipated

supportive and dialogue may be quickly upset when realizing that the lectures were pre-recorded: The MOOC instructor could not converse directly with oneself via a microphone. In the absence of any possibility of a tutorial, one-to-one conversation, the teacher as a meaningful pedagogical presence for the child withdrew. Despite the fact the video still captures the instructors' image and voice, for the child, the video may appear "flat."

"Flat" first of all means "smooth and level" (*Oxford English Dictionary Online,* 2015). A "flat" video lecture, in this sense, may go smoothly through its duration with nothing really troublesome standing in the way. However, "flat" also means "dull, uninteresting" (*Oxford English Dictionary Online,* 2015). Thus, the same video lecture by the word of a child may be experienced as less exciting and less worth noting. The loss of the immediacy of a "live" teacher who is able to engage the child in meaningful conversation seemed to reduce the learning situation to the flatness of "content." The lived-through quality of the video lectures appeared as a green-screened or filmic version of a classroom. The child could only watch and listen. He finds himself merely paying attention to the content delivered. At times, the MOOC instructor appeared to be almost irrelevant or even absent, as the relational learning sphere for him was cut off.

For Douglas, the instructor appeared to be almost irrelevant to his learning experience and apparently slipped into the forgotten background. Still, a sharp contrast is evident between the prerecorded, backgrounded teachers and the uninteresting video scenes, and this child's overall perception of the MOOC being "amazing." Here, the subject matter itself – dinosaur paleobiology – was foregrounded. Despite the lack of teacher interaction, a child may be surprised at how much can be ultimately learned through the videos. And yet, we may wonder if their learning has already been re-oriented toward a different direction.

For a child, the MOOC video lectures may be "just … another DVD"

Zac, an eight-year-old boy, describes

> Dino101 reminds me of the show Zoboomafoo I watched early in my childhood. I loved it! I also liked Life in the Undergrowth and watched it for quite a few times. I watched Walking with Dinosaurs and many other DVDs, too. They inspired my interest in nature. Dino 101 is just like another DVD for me except I have to watch it online. (Zac, eight years old)

At here, Zac compares the MOOC video lecture with the DVDs being watched since childhood. Perhaps for children accustomed to discovering the world as mediated through the audio and visual television screen, a MOOC video lecture seems less similar to a class or "lecture" but more comparable to watching a DVD.

DVD is a disk storage stamped with digital data, here high-quality, pre-recorded audio-visual materials. It intends to be collectable and portable. At the moment one inserts the selected disk into a DVD player and leans back on a couch one enters into a present and re-presented world that is distanced from one's reality. For Zac, all the DVDs he has watched may invite him to partake of the wondrous world of nature and cultivate his interest to learn more. We can almost imagine an eight-year old boy fully absorbed – perhaps even captured – by the filmic scenes, either watching an animal DVD on TV or dinosaur MOOC video on the computer screen – with an entranced face, sometimes a big smile, sometimes a slack jaw with frown eyebrows.

Those of us who have experienced being fully absorbed in a movie may more easily recognize Zac's experience. To be a movie audience means to be immersed in the film's plot or subject while maintain as an outside observer. To enter into a world of movie or DVD, we may have to temporally forget about our surrounding everyday world. This sense of forgetfulness perhaps constitutes of a sense of ease, fun in the activity of watching. The physical, psychological distance from the life story in the movie may allow us to appreciate, sympathize, and perhaps gain some insights toward our own life. In contrast, as a student in a class, even when the teacher is talking, he or she still sits with attention even vigilance, mulling over the point just being made, or getting prepared for (avoiding) a foreseeable question. A student maintains an awareness, an active or passive readiness to incorporate the "live" subject and lived relationship – either with the teacher or peers – in to his or her world. Indeed, a class is the world where a student dwells: Even a distracted student would not consider him/herself "sitting here and watching my class." Yet sitting in front of a DVD under play, the world of a student may transform as a world of an audience. Experiencing a MOOC as another DVD may indicate that a child may get used to be an audience of the MOOC: almost fully "engaged" yet always from a distance.

With family, MOOC video lecture may become a pedagogical moment

The apparent distance from a MOOC video may be accompanied by or open for other pedagogical possibilities.

> 1 pm, right after lunch, on our couch, my mom and I are watching the MOOC video streamed on the TV while eating popcorn. It is a lecture about revolution theory. At some point, my mom says, "Wait a minute. There is something I want to talk about." I go to the computer, click the space button and pause the video. As usual, I am quite curious about what she has to say. Mom then talks about that when I was younger, I was trying to convince other home-schooled kids that chickens is evolved from dinosaurs. It annoyed their parents since they chose home-school for religious reasons. I almost forget this instance. Mom and I just keep discussing about science and religion. Until there comes a pause between us, mom says, "OK, I guess we can carry on." I hit the space button and continue watching the video. (Joe, 11 years old)

The MOOC, most especially its video lectures, may provide the occasion for some kind of "family movie time," when family members gather and watch together. With sweets and popcorn, children sit with parents in living room, watching, laughing, pausing, sometimes rewinding and discuss about the last scene. At first glance, this "MOOC time" can be a family's shared break, a form of entertainment for adults as well as for the little ones.

To "entertain" is "keep up, maintain, to keep (someone) in a certain frame of mind" (*Online Etymology Dictionary*, 2015). To be entertained, we have to be able to frame our own mind within the present task, such as video being watched, in order to temporarily ignore the outside of the frame – for we adults, perhaps the demanding task in everyday life. Yet for children who may maintain a more holistic, undivided view of the world, drawing a frame of mind that separates them from the outside world seems less possible. There may be no "outside world" yet – at least the "outside world" in adults' sense. Children may turn some ordinary life event as a significant moment of learning and growth. When it comes to family MOOC time, a child may look forward to a special mood that beyond the video itself. Here, Joe is anticipating that at some point, mom would make some meaningful comments.

"Wait a minute." After hearing this from mom, Joe stops the video. The screen freezes, the sound disappears, and a new conversation unfolds. Mother and son let their talk "spill over" the MOOC lecture time frame without worrying about digressing from their original structure and focus. They understand the pre-recorded MOOC video lecture is taking "a minute" to wait for them. When the pedagogical dialogue ends, in a brief moment of silence, they are reminded that the MOOC is still stopped there waiting. Joe hits the space button again to resume the video. Together, they continue to watch. With its stop and start features, a MOOC video lecture invite breaks of debrief or pauses of reflection. The video itself may open some pedagogical moments that would be not as possible in the uninterruptible flow of daily life. MOOC lectures, in the company of the thoughtful presence of a parent or teacher, may provide for a rhythm of "pause-resume, pause-resume" where each pause opens onto a pedagogical conversation or other activity together. For Joe, the most meaningful lessons in the MOOC may start whenever the video pauses and mom spontaneously begins to talk.

This time, Joe's mom connects this MOOC lecture with Joe's childhood story. She is showing him relations can exist between science and religion, between abstract theory and concrete life events. And yet, alongside the conversation, Joe may learn something else, too. Educator Mollenhauer (2014) once differentiated pedagogical representation from presentation. Pedagogical presentation is the primal form of upbringing, "the child being very directly confronted with the characteristics, actions, and objects of adult life and culture" (p. 20). Pedagogical representation, on the other hand, refers to the selection and teaching of human knowledge as abstract subject usually by schools and teachers. A central question for parents and teachers would be "what is the relationship between the representation and the thing that is presented" (Mollenhauer, 2014, p.53)?

The MOOC as an educational context may provide an easing of artificial boundaries between home and school and between the representative subject knowledge and a presentative way of learning and living a life. At here, the representative subject knowledge is bridged with an unreflected, presentative real-life event. Joe seems to be presented with an understanding that people may hold different believes; but more importantly, through his mom's attentiveness toward MOOC content and real-life event, he may be exemplified a thoughtful, reflective attitude that makes life-long learning ultimately possible – no matter within or beyond a MOOC.

A child may see in a MOOC what an adult may not

Many MOOCs now provide a variety of customized interactive learning objects. In the context of Dino101, students can manipulate and explore different aspects of dinosaur paleobiology, such as reassembling a dinosaur skeleton from scattered bones. In contrast with some previous interviews conducted by the research team (Adams & Yin, 2014), where the adult participants seemed to show a minimal interest in *Dino 101*'s interactive applications, the child participants demonstrated a genuine passion toward these course components. For example, JR describes his first encounter with a digital interactive "3D Fossil Viewer":

> In the middle of the video, a pause opens the link to "the 3D Fossil Viewer." It's totally 3D! A digital skull hangs above a gird line stage. I zoom in, turn left, right, and then up side down to get a handle of the skull. Some information on the right seems like its archive record telling me who discovered it and at where. There are different

> layers so I could see the bone as well as what the scientists think the muscle on the bone looked like. When I am circling it around and want to see muscle from the other side, my mom who also takes this MOOC says from behind my back: "Hey, what are you doing? Why does it take so long? It is not the real thing anyways and the other side looks the same." "No, they are totally different, you just can't visualize it!" (JR, 15 years old)

Hands dragging, turning, rotating the mouse, zooming in and out, what shows on the screen is a combination of digital lines, sides, shades, and color. This is even not a realistic picture or video of dinosaur skull, but a somewhat abstract resemblance of the "real thing" – as we adults may put it. Yet it seems that this 3D version of dinosaur fossil opens to an immediate and direct access to a young person. JR lets her eyes trace along the rendering of a digitalized shape and shade, not unlike what she might be doing when resting her vision on the contour of natural landscape or on the outline of an ordinary thing or gadget at hand. More, framed by the annotation and information on the side, she seems to be granted a key to unlock a different perceptual and hermeneutical world: a fusion of literal and imaginative layers and structures as well as some learnt perspectives such as "what the scientist's think the muscle on the bone looked like."

However, what seems so effortless and transparent for a child may turn out as somewhat tiring even opaque for an adult. As shown in this example, JR comments that she can "visualize" something while mom seems not able to. What is under question here is definitely not the adult's vision, but perhaps a different way of seeing realities. For a child, the digital may be a "real thing" as well. As "digital natives" (Prensky, 2001, p. 2), they may embrace invitation of the digital world as their native landscape, whereas the immigrant adult parents and teachers have to accustom ourselves to the new language and environmental system of digital. The digital skull captured by the child's eyes seems rather easily overlooked by the adult's eyes; it speaks to the child in a way that an adult cannot fully comprehend, perhaps cannot even hear at the first place – like a new-comer might be to some extent "blind" or "deaf" toward the total foreign aspects of a foreign land. But still, in a MOOC, the immigrant and native habitants are arranged to sit and learn the same curriculum together.

Children may "play" with their MOOCs

The Dino101 video lectures integrate interactive multiple-choice questions. When a question comes on the screen, the video is paused. The student has to respond – either to choose the right answer or to "skip" it. These questions invite the students to take a guess and their answer do not count toward the final scores; the answer will be explained in the later part of the video. Adult learners may appreciate the course designing team's thoughts and effort as to understand the "rationale" behind these pre-structured questions: to maintain the students' attention and engagement. We may pick the right answers as if to finish an assigned task; but if we are in a rush or dislike any interruption during a video lecture, we may simply skip it. However, this may not be the experience of a child learner.

> I wait for the questions to pop up. Then I make a guess. Excellent! It says that I am right then keeps going. It's as if I play a part in the video. I would never skip the question. I remember one time my mom downloaded the video for me when we were on a trip and didn't have the Internet. But the questions weren't there. I wouldn't watch them. The videos weren't the same. (Vincent, 10 years old)

Choosing the right answer for a child may not feel like filling into a pre-determined structure but a creative moment that makes a video alive. Then, he can push it forward so to "play a part" of it. The word "part" seems to suggest a relationship between the child and the course: He takes in charge of a particular role in order to make the video lectures to proceed as a "whole." For children, MOOCs can turn into a playground where to role-play and establish their own understandings of the meanings embedded in a video, a course, and a subject. Another child Joe recollects an instance about the "3D Fossil Viewer" which can help us clearly see this game-playing feature in children's MOOC experience:

> I am sitting watching a video lecture with my brother. In the middle, the 3D Fossil Viewer pops up: a T. Rex's jawbone! I move the mouse up and down, making the T. Rex move like a puppet. We rotate it to see from every single perspective. It has cartoonish layers where I can see the muscles. Then, the most exciting thing happens! My brother and me take turns to give it voice. "Ah … AH … AH … Oh … OH … OH …" We have it roar and bite, chase and fight! We could do this for hours if our mom didn't ask us to get off the computer. (Joe, 11 years old)

A young person may create meanings and relate oneself to what an adult learner may consider boring or dull or lacking in educational utility. While studying the jawbone's perspective and angles, Joe and his brother spontaneously set up the rule to play without even verbal communication with each other: to give it voice and make it fight! They not only give the bone flesh, but also grant it a life; or perhaps they themselves become the dinosaurs they just have learnt! Regarding the phenomenon of children's play, phenomenologist and educator Lengeveld (1984) wrote: "Through play we see how the things in this world need not have fixed meanings. That which in the 'open sense-making' is a pencil now suddenly is a bridge, a road block, a soldier, or a house" (p. 216). In a MOOC – an environment full of fixed meanings and rationalized arrangement that is likely designed for adult learners – the children may still be able to maintain an openness to create their own meaning, and therefore, to learn.

Conclusion

Our study suggests that MOOCs may provide children and youth with learning opportunities that are qualitatively different than those they may experience in a face-to-face classroom or other online learning environments, particularly in terms of supporting new relational configurations. For example, several of the children reported that for them, the MOOC instructor seemed to be almost irrelevant or absent. Such an experience appears markedly different from that reported by adults. Too, for some children, the relational sphere of the MOOC was anchored securely with the parent, who was participating with them. Here, the MOOC seemed to provide a powerful occasion for dissolving traditional boundaries between homeschool and formal school curriculum. Again, we find even at the same MOOC, children may encounter MOOC learning environments and objects entirely different from their adult peers. All of these unique features may provide MOOC provider and educator a clearer vision about this less explored area.

Currently, a wide variety of web-based learning objects and online learning environments are affording more flexible, student-centered approaches to learning in and beyond the K-12 school system. Open-access courses like MOOCs potentially afford significant but uncertain pedagogical possibilities. This research gathered much

needed descriptive evidence regarding what it is like for K-12 school-aged children to learn in a MOOC. Moreover, our research might have potentials to contribute an understanding how MOOCs may fit into the K-12 curricular landscape and better suit younger generation's needs.

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Notes

1. An earlier version of this article has been published in *Global Learn Berlin 2015*.
2. This and other indented paragraphs designate passages are taken from interviews with child–parent participants in this study. Participants chose their own pseudonym.

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