“We Took Pictures”: Children’s Meaning-Making in Physical Education
Abstract

Purpose: Studying learning in physical education in primary schools is complex and largely practical and embodied; not only involving the child, but is also closely linked to the lesson context. The aim of this paper is to understand teaching and learning in primary physical education through the use of photo diaries. Method: Participants were children (n=38) and their teachers (n=2) across a six-week period in two Irish primary schools. Data included children’s photo-diaries, photo-elicitation focus group interviews with the children, and interviews with their teachers. Results: Results highlight that photo-diaries supported children’s meaning-making processes about their learning, highlighting a variety of meanings grounded in the centrality of the body as performance of learning. Discussion/Conclusion: The value of photo-based approaches with primary school age children to access their meaning-making and influences on their understandings is highlighted.

Keywords

Photo-voice, Student voice, Primary physical education
A central purpose of primary physical education curricula worldwide is to support children’s learning towards a physically active lifestyle (Griggs & Petrie, 2018). If physical education is to be embraced by all and regarded as a site for inclusive, lifelong learning, then the meanings and values attached to movement by students are worthy of attention (O’Connor, 2018). Learning can be described as meaning-making resulting in a more developed and specific repertoire to act. In this way learning is “the acquisition of a complex set of predispositions to act. In this process, the world becomes more differentiated. It becomes, in other words, infused with meaning” (Biesta & Burbules, 2003, p. 37). Studying learning in general is complex (Quennerstedt, Öhman, & Öhman, 2011). Physical education learning in primary schools is exacerbated as it largely occurs through the medium of movement and is, to a great extent practical and embodied, not only involving the child, but also closely linked to the lesson context.

Learning outcomes in physical education relate to the physical, affective, and cognitive learning domains contributing to children’s holistic development and equipping them with the skills, knowledge, and dispositions for lifelong physical activity involvement. To gain a clearer understanding of how and what children learn from teaching, how they perceive or give meaning to instructional events must first be examined as children’s perceptions serve as the framework from which they interpret instruction and select learning strategies or cognitive processes to employ (Lee & Solmon, 1992)

From the limited data available, many young people, however, tend not to view physical education as a place to learn. Children’s perceptions reflect their experiences and how physical education is taught highlighting the absence of explicit learning outcomes. Worldwide (Dyson, 2006; Jones & Cheetham, 2001; O’Sullivan; 2002; Smith & Parr, 2007) participation in physical education is perceived by pupils as a break from the rest of school life, an opportunity for non-serious non-academic socialising that is about fun and enjoyment.
While studies have largely focused on secondary physical education, these discourses are evident in the limited information on primary school children (O’Sullivan 2002), though when comparing physical activity and physical education, Parker, MacPhail, O’Sullivan, Ní Chróinín, and McEvoy (2018) found that children indicated physical education was for learning whereas physical activity was for fun.

Since Williams and Woodhouse noted two decades ago (1996) that young people’s views were “a neglected dimension of research into [PE] curriculum practice” (p. 212), there has been increasing interest in young people’s own ideas and understandings, of the ways they engage with physical activity and physical education (Azzarito, 2013; O’Sullivan & MacPhail, 2010). From a physical activity perspective, studies seeking young people’s views have investigated, among other things, the role and significance of physical activity in the lives of young people (e.g., Collier, MacPhail, & O’Sullivan, 2007), the views children assign to physical activity (Patton & Parker, 2013), and the relationship between physical education and physical activity (Parker et al., 2018). Within physical education studies have examined the negotiation and construction of physical education curricula (e.g., Enright & O’Sullivan, 2010); physical education through children’s eyes (e.g., Dyson, 1995; Graham, 1995), and the value of instructional models for learning in physical education (e.g., Dyson, 2001; Hastie & Sinelnikov, 2006).

This literature, often through the use of visual methods, has positioned children as expert communicants of their own cultures, accurately capturing their voices as a reliable resource for understanding their formal and informal experiences (Thomson, 2008). Frequently young people have been asked to take photographs representing their experiences in the broader aspects of physical culture (e.g., Azzarito, 2012; Azzarito & Sterling, 2010; Patton & Parker, 2013). Few, however, have specifically addressed experiences in physical education (Enright & O’Sullivan, 2010; Oliver & Hamzeh, 2010; Treadwell & Stiehl, 2015).
and none, to our knowledge, have examined experiences in primary physical education. Thus
while valuable evidence can be garnered from listening to children’s perspectives, with few
exceptions, perspectives and experiences of primary physical education classes remain
largely absent in the current physical education literature (Cope, Harvey & Kirk, 2014;
Dyson, 1995; Graham, 1995; Parker et al., 2018).

Combining photographs with a journaling process provides an opportunity for
participants to “show rather than ‘tell’ aspects of their identity that might have otherwise
remained hidden” (Croghan, Griffin, Hunter, & Phoenix, 2008, p.345). Treadwell and Taylor
(2017) found photographs helped students reflect on their physical activity behaviors and
better understand issues related to their participation, suggesting that photo-diaries may
provide a viable and practical tool to gain insight into children’s experiences of physical
education and aspects that support their meaning-making.

Theoretical Perspective

Long accepted in physical education constructivist learning theories provide a useful
framework for explaining children’s construction of their meaning-making around learning in
physical education (Light, 2008; Rink, 2001). Although multiple definitions of
constructivism exist, constructivist learning can be construed as “a self-regulated process of
resolving inner cognitive conflicts that have often become apparent through concrete
experience, collaborative discourse, and reflection” (Brooks & Brooks, 1993, p. vii). In
constructivism, learning involves adaptation and change in the learner with learners
constructing their own way of knowing (Rink, 2001).

Three major tenets of constructivism have implications for this study (Rovegno &
Dolly, 2006). First, learning is an active process. From this perspective, children are not
passive recipients of knowledge, but instead, learners who are actively attempting to create
meaning (Rovegno & Dolly, 2006) through decision-making, critical thinking, and problem
solving in authentic and real situations (Munafo, 2016). Second, through creativity learners
draw on past experiences and prior knowledge to discover new knowledge. In the present
study, these past experiences would be situated in the physical education context. Third, this
perspective also accepts the premise that while learning is an activity that individuals must
carry out, it is also a social process “in which various cognizing agents/learners are
inseparably linked” (Munafo, 2016, p. 491). As such, knowledge is created through social
interaction and shared experience.

The use of visual methods to explore children’s meaning-making of their learning in
physical education adheres to the tenets of constructivism as these methods view children as
competent and capable of constructing valid meanings about their world and their place in it
that allow adults to better understand their experiences (Thomson, 2008). For example,
asking children to reflect on their learning in physical education in a photo-diary is eminently
relevant to them as they seek to understand, interpret, and think, about the role of physical
education (and by default, physical activity) in their lives. Visual methods encourage
children to bring their voice to their learning through creatively engaging with their lived
physical education experience. It is a pedagogy that encourages children to explore their
world, discover knowledge, and to reflect and think critically (Brooks & Brooks, 1993).

The purpose of this research was therefore to understand teaching and learning in
primary physical education through the use of photo dairies. Specifically, we sought to
understand children’s meaning-making of learning in physical education and the activities
that influenced these perspectives.

Methodology

Participants and Context

Ethical approval for this research was obtained from the Research Ethics Board of
both Dublin City University and Mary Immaculate College, Limerick; informed consent and
child assent was given by all participants. The research was conducted in two Irish primary (elementary) schools. Participants were two teachers and the children in their classes (n=38; 26 girls, 12 boys) aged 9-10 years.

St Mary’s Primary School is a Catholic, middle class, all-girls school in a large rural town in western Ireland. The teacher had over 20 years experience as a primary teacher, but was not regularly involved in teaching physical education as provision in the school was dominated by external providers. She reported that the children generally experienced a variety of physical activities and that, as a group, they enjoyed physical education. During the six-week period of the research the children experienced a different activity each week: basketball, modern and folk dance, games from long ago, hockey, and novelty games.

The second school, Orchard Lane, is a non-denominational school in a large rural town in the east of Ireland. The teacher had over 10 years of experience in teaching and her class was a mixed, multi-grade fourth and fifth class. She reported that the children participated in physical education weekly, and experienced a variety of content from the curriculum throughout the academic year, usually 4-6 weeks per content area, and that as a group they loved physical education. During the six-week period of this project, the children experienced the end of an athletics unit (1 week) and most of a games unit (5 weeks).

**Research Design**

Across a six-week period, children’s physical education experiences were examined using a combination of photographs and written entries in a journal – what we have termed a “photo-diary.” Design of the photo-diary was based on constructivist principles, aiming to promote personal responses from the children, fostering active engagement with their experiences, and allowing for both written and visual representations. Conscious that photographs by themselves offer multiple interpretations and cannot by themselves provide a complete narrative (Lemon, 2007) we combined the use of photographs with written
reflection in a visual diary (Chaplin, 2011). The cover page of the children’s diary included a space for each child to personalize their journal by depicting themselves in physical education. Next, using Vasily’s (2015) learning framework for elementary physical education, an uncomplicated explanation of learning in each of three learning domains was outlined in accessible language. The “heart” focused on the affective, thoughts and feelings about self and others. The “head” focused on the cognitive domain and included rules, strategies, and safety. Learning with the “hands” focused on physical skill learning. Separate pages for each lesson provided a space for the children to insert a photograph of their learning in physical education and a space to write a response to the prompt, “tell me about your picture and what you learned in PE today (head/heart/hands).” The last section of the diary included a page for final reflection on their learning in relation to head/heart/hands and consideration of aspects that helped and hindered their learning. Finally, the back of the diary contained a section for children to authorize use of the photographs they had taken in research outputs. Teachers reviewed the children’s diary entries on a lesson-to-lesson basis and recorded reflections in a teacher diary. The teacher’s diary began with a space to outline the content and purpose of the lessons they would be teaching. Then a separate page for each lesson outlined prompts for teachers to respond to as follows: “reviewing the PE diaries this week; highlighted to me that…; prompted me to…; and changed my plan/actions in the next class….” Paper copies of both diaries were provided to each school.

The project was introduced to the teacher and children in their classroom by a member of the research team. First, the children’s diary was presented. Examples of each learning domain (head/heart/hands) were shared and discussed with the class. A poster of the three domains was placed in the classroom for future reference. A clear-cut protocol for the use of digital cameras was outlined and cameras were assigned to pairs of children. Children
asked questions about the procedures of taking photos, selecting photos for inclusion in their diaries, and then writing about their photos in their diaries.

Data Sources

Data sources included: (a) children’s photo-diaries, (b) teacher written lesson reflections, (c) photo-elicitation focus group interviews with children, and (d) individual interviews with each teacher.

Children’s photo-diaries. Final data for analysis included 38 children’s photo-diaries. The diaries contained up to six entries per child, giving a total of 228 separate diary entries including 228 photographs. The use of this type of methodology involves the power of the camera being turned over to the participants to document the images they choose. Working with children in this manner “can provide another layer of insight into individual lives by enabling researchers to view the participant’s world through their eyes” (Phoenix, 2010, p. 99). In the results, these are referenced with a child’s initials and the word diary (i.e., MO diary).

Teacher Written Lesson Reflections. Each teacher wrote a one-page written reflection following each lesson giving 12 one-page post-lesson reflections for analysis. Generally, both teachers responded to all three prompts each week and also kept some supplementary notes about each week’s lesson. These are represented in the results by the letter T and the data source, i.e., T diary.

Photo Elicitation Focus Group Interviews. Pair and small group interviews with the children (n=38; 15 interviews) explored the pictures and narratives in their diaries, their learning in physical education, and their experiences of using cameras. The photo-elicitation interviews allowed children to discuss and share the meaning they made of their learning physical education, using the photographs and their diary narrative as a prompt to communicate with researchers as we sought to hear and understand what they were saying.
The interviews were open-ended with an orienting question about children’s feeling about the image taking process. Subsequent questions addressed the specific images taken, focusing on why certain pictures were taken and the meaning they held. Interviews were 15-25 minutes in duration resulting in a total of 75 pages of transcription. In the results, these are referenced with a child’s initials and the word interview (i.e., MO interview).

**Teacher Interviews.** At the conclusion of the initiative the classroom teachers participated in a one-on-one semi-structured interview (30-60 minutes duration). Questions focused on the influence of the dairies and their post-lesson reflections on their practice. These are represented in the results by the letter T and the data source (i.e., T interview).

**Data Analysis**

Data were analyzed inductively using an open and axial coding approach (Corbin & Strauss, 2008). Following familiarization with all data by each researcher separately, analysis took place in face-to-face meetings using hard copy data. Open coding involved looking for distinct concepts and categories within in the data. Axial coding engaged us in making connections between categories identified in the open coding process. First, the team reviewed and coded the photos and written text from each child. Interpretation of photo content was guided by the children’s written explanations with a focus on what the image depicted including consideration of objects, setting, participants, and actions (Ledin & Machin, 2018). For example, we noted the content of photos included group-based game activities and individual skill performance images. Through discussion, patterns within codes were identified and key messages within the data agreed. One of the key messages identified at this point was that in each of the two schools, the children’s photos were very similar to their classmates. To us, this suggested a common influence shaped the children’s meaning-making and photo choices about their physical education learning. Next, children’s interviews were analyzed in search of confirmation, explanation, and additional insight on the
key messages identified from the children’s photos. Again, a variety of understandings of physical education seemed to be reflected in photos, ranging from an emphasis on participation to one focused on skill learning. Then, teacher diaries and interviews were analyzed to provide further context and detail to illuminate the children’s experiences of physical education. Insight regarding the teachers’ approach was useful in contextualizing the meanings children represented in their photos. Finally, the children’s final written reflections were reviewed. These provided a summary of the children’s experiences and served to confirm our reading of the overall data sets. For example, the contrast between children’s abilities to reflect back on and describe their learning added weight to our thesis.

**Trustworthiness**

The trustworthiness of data analysis and interpretation was increased using two techniques: triangulation of data sources and researcher triangulation. The use of multiple data sources including teacher and children’s data from both interviews and photo reflection diaries supported identification of patterns across sources. Also, the face-to-face engagement of all three researchers in analysis of all data facilitated back-and-forth discussion supported a rigorous and thorough interrogation of key ideas and messages within the data set.

**Results**

The results are presented using two overarching themes: (a) varied meaning-making of learning in physical education; and (b) meaning-making of how they learned in physical education. Children’s photo-diaries were our primary data source to access how children’s understanding of learning in physical education was constructed. The photos provided a concrete representation of their experiences allowing them to share what was important in their physical education experiences. JN shared, “I wrote about the pictures and what happened in PE at the same time. That’s what I really did. I didn’t really decide. I really picked my best part in the whole of PE of what I learned” (interview). Children suggested
their photographs were an accurate representation of their meaning-making (see Figure 1). In addition, we drew on children’s writings and interviews, and the teachers’ data to explain children’s constructed meaning, and to explore factors that influenced their meaning-making.

Insert Figure 1 about here

**Varied Meaning-making of Learning in Physical Education**

Children’s meaning-making of learning in physical education varied in terms of complexity and focus. Fundamentally, children’s photo-diaries included a visual representation of activities in which they participated. For all children physical education was active and their photos represented a wide range of physical activities in an enjoyable environment. Yet, what resulted from these activities was quite different. Two sub-themes represent children’s meaning-making of their physical education experiences: (a) fun, and (b) participation with (out) learning.

*Fun.* In essence, the children captured the lesson activities in which they participated and the quality of those experiences. Almost every photo represented an enjoyable moment in activity. Photos demonstrated both children’s enjoyment of physical education, as evidenced by smiling faces and animated body language and their reasons for enjoyment, such as being with friends and engagement in novel activities.

Photos were often of groups engaged in games and collective activity (see Figure 2). The regular inclusion of friends and classmates in photos acknowledged the social role of friends in making their experiences more enjoyable as was frequent indicated, “I chose to pick this picture because…I worked great with my partners and I liked this lesson” (LG, diary). Interestingly, photos of groups engaged in activity were more commonly selected by children who represented physical education as participation in activity without a specific learning focus.

Insert Figure 2 about here
Engagement with new and different content also enhanced children’s enjoyment, “it is good to try something new” (DL interview). Children photos often represented new content, such as hockey and modern dance. Photos of engagement (Figure 3) in these new activities allowed the children to represent the importance of novelty in their physical education experience often in comparison to the past where, “We would usually just play little games and go inside. Our PE was not fun because we always do the same kind of things” (KH interview). For all, fun was an important quality of the physical education experience. For them the connection between fun with learning was obvious, “When you enjoy it, you want to learn about it” (ES interview).

Insert Figure 3 about here

**Participation with(out) learning.** In some cases, children’s photos were simply a visual “record of what you were doing” (EN interview) showing individuals and groups of children participating in a range of activities. These photos allowed children to share the meanings they took from these lessons, primarily related to engagement with a variety of content with children writing about their photo by listing the activities experienced during the lesson: “This week we done hopscotch, skipping, and queeny, queeny” (LC diary) or “one week it was dodgeball, one week it was unihockey, one week it was basketball” (DL; see Figure 4). Photo content and descriptions suggested their understanding of physical education was as a time of active participation. Physical education as a learning time was clearly not a priority, as one boy said, “we didn’t really pay attention to what we learned, we just did it and when it was over and done with we just forgot” (LS interview).

Insert Figure 4 About here

Alternatively, other children’s photos not only portrayed activities, but were an attempt to demonstrate visually what had been learned while participating in the activities. Not surprisingly, what children represented as learning in their photos varied. For some
children, responses were identified as “learning” but were more accurately a description of content that simply equated doing with learning as previously described. For others, there was a distinction between learning and doing, “what you did is more the stuff you did and what you learned is more like what you actually learned and what you remember” (SC interview). Still, many of these children explained their photos in very inexact terms that could be applied to almost any physical education lesson. Their responses were void of details related to learning from the lesson activities they had experienced. For example, while most children indicated they had learned new skills they did not represent the skill in their photo or name the specific skills they had mastered. These children struggled to identify learning in the psychomotor, cognitive, or affective domains. Their learning with the head, heart, and hands seemed vague and generic. LC wrote that, “We learned with the head by remembering. We learned by the heart by playing fair. We learned with the hands by moving” (diary). RA indicated “you had to concentrate for that game and then I learned with my hands with the Queanie, Queanie. Oh and I learned with my heart for, I got stuck on that one” (diary).

Lastly, there were children whose meaning-making about physical education had clear connections to what they had learned. Analysis of the photos chosen for their diaries revealed that most photos captured individual psychomotor learning or ‘learning with the hands.’ Their photos were intended to represent specific aspects of technique that led to enhanced performance (see Figure 5). Their photos provided a visual representation of their learning (see Figure 6).

By moving beyond descriptions of content to offer interpretations of their photos that emphasized the position of their hand or the intention of their action children illustrated an understanding of physical education in which learning featured. For example, AN explained
the importance of his learning to sweep the hockey stick, “if you hit it hard if it bounces off
someone’s stick it could go very far back into your own goals and if you sweep it you could
change direction very quickly to dodge enemy team members” (interview).

Representing learning with the head and heart within photos was more challenging
than learning with the hands. Despite this, children drew on their photos to describe learning
in the cognitive and affective domains. Beyond the recall of cues reflected when describing
their pictures, their diaries indicated learning about the use of skills. These descriptions and
examples were quite detailed, “I learned how to use my head when I am trying to shoot, but
somebody’s blocking me, you just move to the side” (EA diary). Some children were also
able to capture learning in the affective domain (see Figure 7) choosing photographs to
represent moments when they felt they had achieved ‘learning with the heart’ in a lesson.
Children’s photos of group-based activities allowed them to describe qualities of the
experience that were important to them related to learning with the heart, for example “my
team were cheering me on while I was playing. Lots of people were kind” (PO diary). A
photo of a ball being passed to a teammate represented learning related to “you should always
pass to your teammates cos there is no ‘I’ in team” (CG diary).

The children were perceptive about challenges in representing their learning. While
they often recognized learning had occurred, at the same time they had difficulty visually
capturing the learning, even in the psychomotor domain. In an interview PN shared,
It was kinda difficult cause sometimes you wanted to take a motion picture, like in
basketball if you were dribbling you want to take a motion picture, you have to click
the button, then you have to bounce the ball and the ball would kinda be in mid-air.
Despite challenges in capturing the totality of experience using photos, the children were successful in sharing the meanings they took from their physical education experiences with emphasis on active fun participation in physical activity with others.

**Meaning-making of How They Learned**

Taking, selecting, reflecting on, and writing about photographs helped children to make meaning of their physical education experiences, and, for some, was an opportunity to explain how that learning happened. Two sub-themes represent the influences on children’s learning experiences.

**Multiple influences on learning.** Some children were better than others in describing both what they learned and how they learned. The assorted meanings children made of their physical education experiences prompted us to examine in more detail factors that may have shaped these understandings. Children’s photos showed them actively participating but the work they, and others, did to promote their learning was not necessarily evident from solely looking at the photos. While photos allowed children to show what they did and their enjoyment of it and in some cases what they learned, photos were more limited in demonstrating how that learning happened and the qualitative nature of their engagement.

The photos did, however, provide a springboard for children to respond to a written prompt considering what had helped their learning and supported discussion of their learning in interviews. Children’s understandings of what influenced their meaning-making, included their own personal actions, their peers, and the teacher.

Children identified their learning process as active, “I learned it as I was playing. Every time as I did an action or anything I just learned something” (YN interview). Learning was synonymous with doing and enhanced by actions such as listening and concentrating.

Reviewing their own photos also an active process that helped children make sense of their experiences “when we stuck in the picture with glue we could look at it and remember where
we were and what we did” (LH, diary). As well as viewing their learning as a personal process, the children identified the valuable role of others in their learning.

The social and shared nature of learning was consistently emphasized as an important factor in their learning. For example, KK shared “all my friends helped me with my learning” (diary). Children also provided insight on how peers provided support, “my friends always gave me tips of how to do the things” (PN diary) and “if someone helped me and by watching other people doing it” (FJ diary). AH suggested her learning was helped by helping others, “that I was a team player and helping my friends out (diary). Friends were also able to accommodate learning by scaffolding the learning process in “child friendly terms” (see Figure 8). Observation of peers through the photo process may also have supported learning, for example, “I didn’t just learn from myself; I learned from others when I saw if they did something I would think if that could actually work on them it might be a good thing for me too” (YN interview). The shared nature of the physical education experiences, even though not always represented in photos, was consistently expressed in talking and writing about photos. The teacher did not appear in any photo, but in both schools her role was central in how children framed and interpreted their learning experiences.

Children’s meaning-making of learning mirrored teacher intent. Children identified the teacher as essential to their learning in physical education. The teacher supported learning by “explaining the rules” (NK interview) “going through how to hold the ball properly” (LN interview), and through “guidance, basically imitation” (AN interview). It is noteworthy that the teacher does not appear in any photo in either school. This may have been an intentional choice on the part of the teacher but may have shaped children’s ability to represent their understanding of learning in physical education.
Children’s suggestions when asked how they expected the teacher to engage with their diaries revealed understandings of their teacher’s purpose. Some identified fun as most important, “it could help her to know what we enjoyed, what exercises we liked” (EK interview). Others equated their teacher’s intent as helping them to improve, “she might see what were are not good at and what we are good at and what we need to work on better” (LL interview).

The teacher’s intent shaped children’s understandings of their physical education experiences in a number of ways. The children who identified their own actions as being what aided their learning held several things in common. They were the children who recorded the activities done, identified enjoyment as the primary outcome of physical education, and were unable to describe with any detail what had been learned in physical education; and, they were largely in the class of a teacher whose focus was on children’s enjoyable participation in physical education. This teacher’s strategy to deliver a variety of content where children engaged with new activities every week provided novelty of experience, which the children enjoyed. All of her diary reflections reported on the enjoyment of the girls. She noted “how much they love PE” (diary). This therefore reinforced her continuance with the introduction of new activities each week as her physical education programme planning strategy. This teacher outlined learning as an incidental by-product of fun participation in activities. She did not plan for specific learning or articulate learning goals for each lesson. Instead, she described ‘doing’ the activity of the lesson and identified objectives in broad terms such as “develop an understanding of the game, appreciate and enjoy, learn new skills” (diary). Her lack of structure and identification of specific learning intentions resulted in some children being unable to identify their learning and others inferring learning based on past experiences. Despite the lack of teacher direction, the children saw value from their participation, equating learning with doing was their reality.
In contrast, the other teacher took a more focused and structured approach to teaching physical education; learning was at the forefront. First, she identified learning outcomes for each lesson and used verbal cues to scaffold learning. As a result, the children used this language consistently in describing their learning (see Figure 5). The emphasis on learning in these children’s data is indicative of how the teacher planned the lessons and how she taught.

The teacher promoted a mastery climate valuing learning: “children like to be told how to do something properly” (T interview). If there was something she could not demonstrate she provided YouTube clips and videos so the children could see the skills demonstrated by ‘experts.’ Children valued the use of videos in supporting their learning. YZ commented, “Well, the teacher was going through how to hold the ball properly so she was teaching us how to do it” (interview). In more detail he described,

> When we were doing basketball and we were doing 3-on-3 games she went to her laptop and showed us a little tutorial of how to play and some others of basketball and dribbling. All of this and I think that this really helped us to do it. (interview)

The teacher provided additional support for children’s learning as the need arose and used the photo-diaries as a feedback mechanism to focus on specific aspects of her teaching and the children’s learning. She explained, “I was more aware of what I was teaching them and I think that lead to a more structured approach to PE which I think was more beneficial for the children” (T interview). She used the photo-diaries to channel the children’s attention on aspects of their learning. For example, prompting them to think about capturing their learning in the photographs and writing about their learning. The teacher noted, “I think getting them to reflect on the PE lesson helped them become more reflective ‘ok what did I learn, what do I need to improve on or what worked well’” (T interview).

The specific guidance from this teacher may, in part, explain the similarity in photos from children in her class where children demonstrated the same skill in their photos and
used the same cues to describe what was happening in the photos. It is noteworthy that the
children in this teacher’s class almost all identified their teacher as helping them to learn.
While photo-diaries did allow children to personalize their learning and how they learned, the
outcome of their learning reflected teacher intent.

**Discussion and Conclusion**

The purpose of this study was to understand teaching and learning in primary physical
education through the use of photo dairies. Specifically, we sought to understand children’s
meaning-making of learning in physical education and the activities that influenced these
perspectives. From one perspective the results shed light on children’s construction of
learning in physical education, while on the other hand the photo-dairies became a defacto
pedagogy tool allowing children “to creatively make sense of themselves and to reflect on the
ways they create their identities and their bodies, not only verbally but also visually”
(Azzarito, 2010, p. 158). Lastly, following Azzarito’s (2013, p. 1) call to include visual
images in research design in an effort “to understand and provide a more problematized
picture of the nuances and multifaceted embodied experiences of people,” the methodology
provided access to children’s meaning making. We draw on aspects of constructivist learning
to explore the value of photo-diaries to children’s construction of their meaning-making around learning in physical education.

First, for these children learning was active, social, self-regulated, and linked to past
experiences. Through images of performing and participating in physical activities the
practical and embodied nature of their experiences illustrated their understanding of physical
education as a ‘doing’ activity and emphasizing the body’s role in learning (Light, 2008).
Yet, the children’s construction of learning in physical education identified learning that was
not only physically active, but also cognitively and emotionally active integrating movement
content and cognitive processes (Rovegno, Chen, & Todorovich, 2003).
This construction of meaning in physical education occurred in an environment that was, first and foremost, fun. Fun represented a social environment that included friends and novel activities. Friends not only made the overall experience socially enjoyable, but shared in the learning of their classmates by providing feedback and assistance reflecting the active use of cognitive processes such as analysis, reflection, and critical thinking (Rovegno & Dolly, 2006). Yet, while friends shared in the experience, the role of the self in learning was highlighted. In essence, these children constructed learning in a group setting where individual and social processes occurred concurrently and interactively (Borko, Mayfield, Marion, Flexer, & Hiebert, 1997) emphasizing the notion that meaning making occurred through interactions with others and with the environment of the physical education space.

For these children the current active and social environment was juxtaposed against previous physical education experiences. In creating this juxtaposition children were able to identify ways in which the current environment had positive influences on their meaning-making or learning and that their previous conceptions of physical education learning (or lack thereof), might well have been inaccurate and incomplete. Interestingly while prior misconceptions have been identified as hard to change, for these children, the change was quite obvious and readily acknowledged. As a result, they were able to take learning beyond doing to a deeper understanding of what they were doing and why (Rovegno & Dolly, 2006). A word of caution is however warranted; the children who equated participation with learning considered each new activity a new learning opportunity, suggesting they had little appreciation for learning across time or what the development of deep and rich learning might entail.

Second, the photo-diaries became a pedagogical tool allowing children to actively engage with making sense of their experiences. The photo-diaries offered a scaffold for children to personally construct knowledge as well as a means to represent this knowledge.
Children were active taking photos, which formed part of their meaning-making about learning allowing them to be creatively and practically engaged (Thomson, 2008). Positioning the child at the center of the process recognized their role as expert on their own world and focused on their own personal meaning-making (Thomson, 2008). Jones, Santos, Mesquite and Gilbourne (2012) suggest that visual methods might be considered as ‘quasi-constructivist,’ suggesting reality is “not simply captured in a photograph, but chosen, interpreted and framed by the photographer” (p. 268). In this study, children actively constructed their images; they posed and took multiple images to represent their intent. In making these choices, photo-diaries allowed children to “speak for themselves” and may have been particularly liberating for children who found communicating their experiences through words more challenging (Thomson, 2008).

Writing about their selected image was an active process of constructing meaning from experience. The diaries were a record of their physical education experiences and while some children simply described what they did, for others, engagement with the diary promoted reflection regarding what they had learned and what was important to them. Connections to previous knowledge acted as a scaffold to build new understandings comparing current physical education experiences to past physical education experiences. The use of cameras in physical education was also novel and reflection on photos helped children gain new perspectives about their own participation. In particular, watching other children perform and taking their photos provided legitimate moments for children to step outside of physical participation to observe and make sense of experiences in new ways.

In another sense, the photo-diary processes promoted interaction with others, pair and group activity, and the application of knowledge as integral to learning. While the meaning-making about their learning ascribed to events was individual or personal, the social and shared nature of meaning-making was acknowledged. Photos accommodated consideration of
the factors that influenced children’s physical education experiences, such as friends, teacher approach and lesson context.

Lastly the use of the photo diaries gave others access to the children’s world (Thomson, 2008). As reported by others (Patton & Parker, 2009) we found that photos helped us to understand the nuances of children’s experiences. By communicating what was important to them in their learning, we were better able to appreciate what influenced the quality of these children’s learning experiences. Similar to others who have used visual methods to capture children’s perspective about learning to inform a teacher’s approach to physical education (Goodyear, Casey, & Kirk, 2014) the children hoped that their sharing would influence future teacher actions.

Within a constructivist frame, the influence of the teachers’ approaches on children’s meaning-making merits consideration to the meaning children constructed about their learning. One teacher was focused on providing fun learning opportunities; learning was a by-product of doing, and it was not predetermined what that learning might be. Thus, the meaning-making of physical education for some children in this class remained fixed on participation and enjoyment. Other children within the class, perhaps by drawing on past experiences, were able, to varying degrees, to identify learning from their physical education experiences. While it might be considered that this environment supports constructive learning, approaches such as this may serve to misconstrue constructivism. Authors (Clements & Battista, 2009; Rovegno & Dolly, 2006) are clear that a constructive approach is not undirected or unguided learning. Instead a teacher, who supports constructivist learning poses tasks that bring about “conceptual reorganization” by structuring the cognitive and social climate of the classroom (Clements & Battista, 2009, p. 7). A constructivist learning experience should be structured just enough to make sure the students get clear guidance and parameters within which to achieve the learning objectives, yet be open and free enough to
allow for the learners to discover, enjoy, interact and arrive at their own, socially verified version of truth (Clements & Battista).

Alternatively, the second teacher was intentionally focused on what the students knew, brought with them to the classroom, and how they were understanding (Rovegno & Dolly, 2006). This teacher adopted a range of strategies to focus on children’s thinking about their movement (Ennis, 1991). Almost all children in this class identified learning in each lesson that aligned with the teacher’s intention, and was similar to the learning identified by all their classmates. In this case, the photo-diaries provided children with an opportunity, to some extent, to personalise and make sense of their experiences as individuals beyond performance of a specific skill and knowledge of cues related to the skill. The information shared by the children allowed the teacher to support and accommodate individual learner experiences and address gaps in their learning. This teacher used the photo-diaries as an important source of feedback about student experiences and to make inferences about their progress in learning.

Ultimately, it is encouraging that photo-diaries can play a role in learning by allowing children to articulate their learning. Researchers have recognised that photos have “power to focus the eye (and the mind) and evoke emotions” (Freeman & Mathison, 2009, p. 110). Our focus was on an everyday moment of children’s lives, participating in physical education. Pope (2010) illustrates how photo-based research can add value to these moments: “the more we look, the more we see; the more we see, the more we learn; the more we learn, the more we understand” (p. 205). This observation is played out in the current project as the photo-diaries helped to focus the children’s eyes on themselves as learners and allowed for reflection on those learning experiences.

A number of interesting points emerged in relation to what photos could or could not represent. First, photo-diaries allowed children to communicate how they conceptualized fun,
an oft-elusive concept to pin down. Understanding the nuances of their experiences and what
influenced individual’s enjoyment can help teachers to develop learning environments that
reflect enjoyment. Second, for these children, the body and physical performance of skills
were privileged in photos. Affective and cognitive learning were much less represented.
While this may reflect the content of lessons and teacher intent, it also raises questions about
what can be captured in a photo. We explain this by suggesting that such learning is more
difficult to show in a photo and indicate value in combining visual methods with others, in
our case written reflections and interviews, to contextualize the images. While the photos
were a legitimate hologram of children’s’ learning and have merit as a stand-alone
representation of experience, allowing children to communicate their experiences in other
forms provided a richness to emerge in ways that avoided any imposition of narrative by the
researcher.
In the end, what is clear is that photo-diaries show considerable potential as a means
to support and enhance children’s meaning-making as learning in physical education. The
process of constructing diary entries supported children to engage with, reflect on, analyze
and share their meaning-making about their learning. The inclusion of visuals helped children
make sense of their learning in physical education in ways that positioned the body as central
to their experience. The design of photo-diary processes complimented and promoted
constructivist learning. Most importantly, photo-diaries supported these primary-aged
children to share their meaning-making, their interpretations of their experiences and their
learning on their own terms.

From a methodological perspective, the children in our research were aged 9-10.
While similar photo-based methods have been used in physical education with older children
(Azzarito, Simon, & Marttinen, 2016; Enright & O’Sullivan, 2012) and in out-of-school
contexts (Noonan, Boddy, Fairclough, & Knowles, 2016), few have been used with young
children. We suggest a shift is needed from children’s current understanding of camera use in physical education as a novelty to children using visual images, such as drawings and photos on a regular basis to enhance teaching and learning experiences. Such approaches allow access to children’s meaning-making about their learning and holds the potential for children to consider what was meaningful about those experiences (Beni, Fletcher, & Ní Chróinín, 2017).

Acknowledgement

The authors would like to thank sincerely the two reviewers who took inordinate care in providing useful and guiding feedback.

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