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Everyone is welcome under the big top: a multiple case study on circus arts instruction in physical education

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ABSTRACT

Purpose: This study aimed to explore the implementation and impact of circus arts instruction in physical education (PE) classes through a multiple case study design.

Data Collection/Analysis: This multi-site case study explored the implementation and impact of circus arts instruction in PE. Participant observation took place over the course of 16 hours of PE class time in a two-week period. Themes were created by collapsing common observations, following Braun and Clarke's six-step thematic analysis process.

Findings: Circus implementation in elementary schools revealed a wide array of benefits to both teaching practices and student experience based on four themes. The themes included: (1) Circus in action: a shift in pedagogy; (2) Teacher training in circus; (3) Facilities and circus equipment; and (4) Pedagogical strategies.

Conclusions: With the integration of physical literacy enriched pedagogical practices, circus arts instruction created a gymnasium space inclusive to all students by addressing a number of barriers often observed in PE related to sex/gender equity, and inclusion of different levels of ability (physical and cognitive). Our findings suggest that circus arts is one of the best known examples of a physical literacy enriched experience, with inclusion at its foundation.

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Introduction

As defined in the Canadian consensus statement 'physical literacy is the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life' (ParticipACTION et al. 2015, 1). One of the core principles that underlies the definition within the consensus statement is 'an inclusive concept accessible to all' (ParticipACTION et al. 2015, 2). In Canada, as well as many other countries, physical education (PE) pedagogy is being explored regarding its role in decreasing the risk of non-communicable diseases (Lu and Lode-wyk 2012), increasing physical activity levels (Bailey 2006), and increasing social competencies (Chung 2010), all factors that can be influenced by physical literacy (Cairney et al. 2019; Jefferies 2020). Beyond increasing the quality and quantity of active participation, PE has an opportunity to create a more inclusive space for all movers. Further, pedagogues have the potential to influence student valuation of and participation in movement (Jung and Choi 2016), making them a critical group to positively impact children's movement behaviors. For this reason, researchers and practitioners are actively investigating different pedagogical practices (e.g. non-linear pedagogy, linear pedagogy, constraints-based learning) in an attempt to shift away from a sport-centered PE curriculum (Ennis 2014;

Kilborn, Lorusso, and Francis 2015; Rudd, Strafford, and Davids 2020; Tocci et al. 2022). In this regard, a variety of investments have been made in Manitoba to create a more holistic and inclusive PE model that combines hegemonic practices with alternative practices, offering the highest minutes of PE in Canada, with PE mandated from kindergarten to Grade 12 (Government of Manitoba 2018).

One of the programs that has grown substantially over the past few years is circus arts instruction in PE (from two to 11 schools in Manitoba alone). Price (2012) suggests that circus in school ‘may intrigue not only those who tend to ‘opt out’ of PE but offer all children an option other than traditional sports, that has the potential to expand their abilities in physical skills, social skills, problem solving, creativity, confidence and sense of adventure’ (1). The multiple disciplines featured in circus (e.g. acrobatics- aerial and floor, balancing, juggling, and clowning) and the pedagogical practices typically used, allows for engagement and exploration regardless of one’s gender, ability, race, age, or interests. Kriellaars et al. (2019) have demonstrated the positive impact of circus arts instruction in PE, where physical literacy enriched pedagogical practices used by circus instructors has resulted in substantial increases in physical literacy, as well as being able to extinguish the gender gap in movement competence in elementary students compared to matched comparison schools. Further, studies conducted in New Zealand, France, Brazil, Spain, Hong Kong and several other countries around the world indicate circus arts instruction as an emerging option for a more inclusive PE experience (Chung 2010; Burkel 1969; Funk 2018; Ontañón, Duprat, and Bortoleto 2012). With this, there are many similarities in the inclusive and holistic approaches deployed in both physical literacy (Kriellaars et al. 2019; Stuckey et al. 2021) and circus arts (Tucunduva 2021) focused pedagogical approaches, but these have yet to be fully explored in PE settings. As such, the addition of circus arts instruction has the potential to positively impact physical educators’ pedagogical practices, and in turn, benefit a broader range of children and youth.

In 2016/2017, a partnership between the University of Manitoba and the Center for Circus Arts Research, Innovation and Knowledge Transfer (CRITAC) of the National Circus School in Montreal developed a circus arts instruction implementation project in Winnipeg, Canada based upon a three-year Social Sciences and Humanities Research Council (SSHRC) funded research project. The collaboration of these organizations allowed for a multi-disciplinary team to aid in the implementation of circus arts instruction in PE classes at multiple elementary schools. Considering the lack of information on the implementation of new practices in PE (Howie and Stevick 2014), and the importance of qualitative studies for a naturalistic analysis of the school culture (Jachyra, Atkinson, and Washiya 2015), this study aimed to explore the implementation and impact of circus arts instruction in PE classes in Winnipeg, Canada through a multiple case study design.

Method

Study design

An exploratory multiple case study design (Stake 2006; Coudriet 2013) was used to examine PE practices from an interpretive naturalistic perspective (Thompson 1983). This qualitative approach was implemented to attempt to preserve the natural environment within the PE context of each school (Lewis 2014). Therefore, this qualitative approach allowed us to observe the pedagogical process naturally, and the relationships that formed between teachers and students, the inclusive practices they developed, and the overall implementation of the circus arts instruction program. Ethical approval was obtained from the University of Manitoba’s Health Research Ethics Board and divisional approval was also granted.

Setting: schools, teachers, and participants

The three schools were all located in one school division spanning a large region of Winnipeg with very low to moderate family incomes. All schools were elementary public schools with kindergarten

to grade 5, two were English only and one was French immersion with a total enrollment of 644 students (about 200 per school). The nominal class size was 25. All three PE teachers were specialists with over 10 years of experience, and teachers completed the circus arts instruction e-learning training program at the National Circus School. Grades 4 and 5 were initially targeted for implementation, however, the implementation rapidly migrated to all grades within the first year. A school division-based Health and PE supervisor provided primary support for implementation, and the superintendent and all principals were engaged and supportive from the outset. The program has grown from the initial two K to 5 schools (400 students, three PE teachers with circus diplomas) in 2016 to 12 schools from K to 8 (about 3000 students, 14 PE teachers with circus diplomas) in 2022. This report is focused on the implementation and experiences for the initial two schools recruited in 2016 and a third that commenced in 2017.

Procedure

Participant observation (by two observers) took place during eight PE classes (three in school #1, three in school #2, and two in school #3), and three additional sessions of free practice during lunch time (once at each school), and three school-based performances resulting in a total of 16 hours of observation over the course of two weeks. PE class duration was between 30 and – 45 minutes, depending on the school. Both observers had extensive experience (> 20 years) in PE contexts, and both were knowledgeable about circus. The in-situ observations followed the guidelines of Anguera et al. (2017) and Woods (1996), and data were recorded in a field notebook (paper and electronic). Observations were documented during and immediately after each class, and notes were additionally reviewed at the end of the day. Further, information obtained through informal conversations with teachers was added to complement the observation notes.

In order to create an environment of empathy within the participant observation context (Jachyra, Atkinson, and Washiya 2015), the observers implemented the following strategy: for the first third of the class, the observers remained seated without any direct interaction. Gradually, children spontaneously approached the observers asking them about the circus or showing them the new skills they learned. In the remainder of the class, the observers circulated around the gymnasium, having short conversations/interactions with children and teachers, keeping their presence subtle and trying to avoid the sense that they might be evaluating activities or behaviors. Observations were conducted independently, then after the observations, the two observers conducted a confirmatory sharing exercise to consolidate observations.

Analysis

Guided by Bourdieu and Wacquant (1992), the data were interpreted using a critical hermeneutics perspective, presenting findings in a narrative form (Garrett 2016). Based on the six-step thematic analysis process as outlined by Braun and Clarke (2006), the data were grouped into four thematic categories: (1) A shift in pedagogy; (2) Teacher training in circus; (3) Facilities and circus equipment; (4) Pedagogical strategies. Themes were created by collapsing common observations, and decisions around defining and refining themes were based on consultations between the two researchers until agreement was reached.

Findings

From the start, the positive impact of circus arts instruction was apparent in these schools, and will be described below using the four themes (a shift in pedagogy, teacher training in circus, facilities and equipment, and pedagogical strategies). In all three schools, the administrators, PE teachers, as well as the school division's Health and PE coordinator played a critical role in the successful

implementation of the circus arts instruction in PE, and all continue to do so to this day as the program grows.

Circus in action – a shift in pedagogy

PE teachers explained that the implementation process was predominantly approached in a spirit of exploration, which also appeared to be reflected in student behaviors. The freedom for students to explore new circus disciplines allowed for a unique opportunity for all students to engage in a series of positive movement challenges and find their movement voice. Enjoyment and a deep appreciation for the activities was an important aspect observed during all sessions, in fact it was clear that children weren't just having fun by being distracted, but were indeed deriving pleasure from their engagement in competency progressions (learning). Active engagement by all students in the circus disciplines was visible from the beginning to the end of class, as you would imagine experiencing a good circus show.

During the circus classes, teacher interaction with students was constant and very active and engaged, providing support and an adequately safe environment for all students to engage in competency progressions in the circus discipline(s) of the day. Two levels of class organization were observed. The first level of organization was designed by the teacher, usually in the form of circuits (e.g. stations with different circus disciplines- trapeze, acrobatics, rola-bola, stilts, juggling, etc.). For the observers, it was like standing before the *Ringling Brothers Circus*' three-rings (Loxton 1997), trying to focus on some of the show's many attractions. The students circulated freely through the stations without any strict instructional intervention from the teachers, except the presence of wall-mounted progression charts. A second level of organization superimposed on the first, which was organized by the children themselves based on their interests and personal affinity. The child-led class organization allowed for a sense of ownership over their movement creations to be developed by each student, leading to a sense of belonging in the gymnasium space as they explored their own movement voice. The fluid connection between the two levels of activity organization became evident when we observed children spontaneously and autonomously helping and connecting with their peers constantly.

The freedom of exploration also led to a culture of 'can I show you what I can do?' where students would frequently come up to the teacher, to us as observers, and to their peers to demonstrate the new skills they learned. As observers, this further emphasized the simultaneous development of competence and confidence taking place, regardless of their starting point. We attributed the significant interaction and engagement to the creation of positive challenges for all (Jefferies 2020) where a level of challenge for every level of ability was present, and children were committed to progression not only based upon prescriptive increments (derived from the wall charts) but also involving artistic or creative progressions that were self-directed by the child. We believe this nested organization strongly fostered the child's agency for self-directed participation (Sorbring and Kuczynski 2018). For instance, on the first day returning from spring break, a student in the hallway pulled out a diabolo from their locker, and asked to show his PE teacher what he had learned. This child had had only one diabolo lesson on the day prior to spring break and went home and purchased their own apparatus, and self-learned using YouTube to create a full diabolo show. This child performed the act in the hallway during class break to the spontaneous applause of all children from various grades.

In multiple instances, educational assistants (EAs) and sometimes physical therapists (PTs) accompanied their students during a circus arts PE class. As this was a unique circumstance that the EAs and PTs had not been exposed to before, their initial response was good, but their approach was to engage their students through spectating others. During the initial exposure to the circus class, the EA and PT guided their students through the space allowing the students to observe their peers moving, but with no direct interaction/participation with the circus disciplines themselves. Later in the class, there was an opportunity to talk to the EA and PT and encourage them

to try a new strategy to engage their students within the class. In one case, in particular, the EA and their student (a child with a physical disability) decided to try Chinese plate spinning. Not only did the student become fully immersed in the activity and class, but also other classmates immediately began to gather and interact with this student, generating empathy and authentic connection between classmates that had not been previously observed, as emphasized by the teacher. It became evident that a circus implementation in the future should necessarily involve training for EAs and other support staff so as to be more inclusive for students with different needs from the outset. We observed in numerous instances where neurally diverse students (e.g. autism spectrum disorder) were able to participate in activities along with their peers and form connections that did not previously exist. In fact, all three PE teachers spoke of a new circumstance for students with different sensory needs whereby they found a sensory safe space and place to integrate movement with others.

Regular communication among teachers across the different schools was indicated as an excellent mechanism for knowledge exchange and learning. Successful practices and challenges experienced in class were discussed, creating a community of practice through 'WhatsApp'. The community of practice also led to the creation of a shared PE-specific circus progressions document for each of the major circus disciplines shared on the cloud for continuous updating. Additionally, the enthusiastic support from the division's Health and PE coordinator seemed to keep motivation high and supported teachers through the learning curves of implementation.

Teachers from the schools where the implementation process started, reported organizing shows inviting parents, school personnel, and the community to come to watch the circus performance. This public activity became an important opportunity for parental and community engagement with the school, as well as promotion of the impact of the circus arts instruction program. Showcasing the acts students had been working on to parents resulted in several comments along the lines of – what did you feed my kid in school to create such confidence? Also, beyond the gymnasium, music teachers became involved in the implementation process, expanding circus arts implementation among other teaching disciplines in the school leading to very unique and collaborative performances or shows in each school. The collaborative expansion of circus arts beyond the PE setting suggests a culture change within the schools related to the relationship between PE and other academic subjects, a connection minimally made before the implementation of circus arts. In one school, a self-written original musical was created involving circus and singing, which was performed for parents based upon a story of a child going to circus school. In another school, a big top production was produced and performed for parents, and finally in the third school a physical literacy uprising was undertaken tied to the parent/teacher night.

Active participation and commitment exemplified by the PE teachers was a remarkable aspect in all three schools. All PE teachers reported their strong belief related to the potential of circus arts instruction, despite them still being relatively new to circus themselves. Unsolicited, they all remarked on how circus was a great way to develop physical literacy. It is important to note that all the PE staff had substantial exposure in physical literacy professional development every year for five years prior to the implementation of circus.

Teacher training in circus

First, it is important to mention that all teachers involved in the circus arts implementation were PE specialists with over 10 years of experience, a unique characteristic to the province of Manitoba's education policies. These teachers participated in a 17-week e-learning program complete with a one week, intensive in-person training at the National Circus School in Montreal. This program is Canada's only diploma offered specifically for circus arts instruction. Every year since the inception of the program, two to four PE teachers from this school division are enrolled in the course, in the first year of implementation 50% of the costs were defrayed by the research grant, however in subsequent years all costs were borne by the division and teacher's stipends for teacher training. The

costs of the equipment and installation were also defrayed in the first implementation year, and all equipment and installation costs were borne by the division from 2018 to date.

The National Circus School training was an essential piece for the implementation process, offering teachers technical and pedagogical competencies specific to circus, resulting in dramatic enhancement of teacher self-efficacy as it relates to delivery of circus. On several occasions, PE teachers highlighted the relevance and importance of this training program, as none of them had previous circus experience. To gain a better understanding of the change in teacher confidence with implementation of circus skills, we undertook a stop light analysis (red = will not implement, yellow = would implement after experience, green = can implement now) of approximately 45 different circus skills before and after the teachers completed the National Circus School training. Before their training, teachers ranked almost all circus skills as red or yellow, whereas after the National Circus School training, all but approximately 10% of the 45 skills were now ranked as green, and the remainder became green after direct experience integrating the skills into their class. For example, aerials (e.g. silks and trapeze) were most commonly cited as red, but after teachers were taught the appropriate progression for these aerials, and after they attempted with their own students, the teachers remarked that they were then able to identify the adequate safety threshold. PE teachers often remarked that initially they had a safe as possible approach to circus where they adopted a surplus safety risk perspective, and then eased into a safe as necessary or adequate safety mode after the training.

Physical education teachers expressed on several occasions that this circus arts instruction training done at the National Circus School in Montreal represented a key if not essential starting point for the implementation process. Not only did this training provide them with the necessary competencies and confidence to deliver the skills, but it also provided teachers with documentation (course completion certificate) to accompany their newly acquired skills. However, the e-learning training and one full week of face-to-face training may require supplemental modules considering the teachers' lack of experience with circus instruction, and the rate at which their students were progressing beyond what was taught in the training. Although the internet and the community of practice became important resources, offering supplemental modules, drills, and other pedagogical tips, as teachers reported the need for continuing education in order to learn in more detail some disciplines (e.g. trapeze), or be exposed to more advanced progressions for disciplines they have already been exposed to. As a result, a formal dialogue between the National Circus School and school division has been initiated based upon this need.

Facilities and circus equipment

The majority of the circus activities took place in the gymnasium, but we observed a spillover effect, where students were applying the circus skills they learned in PE in different school contexts including hallways and other non-didactic spaces. The set of circus equipment acquired exclusively for the implementation process was, in itself, motivation for all. The equipment starter kit included: aerial silk (1), aerial trapeze (1), aerial hoop (1), runway foam mat (1–2), juggling balls (90–30 sets of 3), rola-bolas (8), spinning plates (8), unicycles and helmets (8), coiled springboard (1), docking mat (1), four-level stackable trapeze mat (1), flower sticks (8), indoor slackline (1), diabolos (8). Juggling rings (12), pogo sticks (6). Equipment such as the rola-bola, juggling clubs, diabolos, and unicycles were relatively unknown to the students prior to this exposure.

It seems that the quantity and variety of equipment was sufficient in all three schools, although teachers indicated that they would make some changes to the shopping list moving forward based on their experiences, especially as it related to quality of equipment, considering the continuous use over multiple classes per day (especially pogo sticks). The item most commonly requested by teachers not included in the starter kit was stilted. One of the very important elements that facilitated implementation was the ability of internal staff (e.g. maintenance) to affix aerial equipment to the ceilings. In one gym, a total of five fixed attachments were made. The training at the National Circus

School with professional riggers that the PE staff were exposed to, and access to the National Circus School staff for questions of rigging, fostered a relatively cost-effective and safe implementation of aerial rigging for silks, trapeze, hoop, cubes and ropes. This cost and uncertainty may have presented a barrier for many other jurisdictions.

The diversity of equipment also provided for integrated participation of neurally diverse with neurotypical students especially based upon the organizational structure of the classes typically used (described above). The teachers remarked that the integration of neurally diverse students provided many opportunities to explore pro-social behaviors, such as passing the spinning plate between students (possession and return tasks). Teachers also remarked that there were more authentic connections between students, as well as empathy developed by neurotypical students.

With the diversity of circus equipment and associated disciplines, this allowed all students to be exposed to basic skills in each category, allowing children to find their passion (their movement voice). With free time included as part of lesson plans, and with circus clubs, children could pursue their passions in circus activities. Interestingly, this created equal opportunities for children of both sexes to participate, as well, circus created a school environment where inter-grade interaction was commonplace. It was quite common to observe a significant interaction between male and female presenting students related to a shared passion for a circus discipline. This certainly aligned well with circus instruction fostering a gender equitable environment consistent with published findings (Kriellaars et al. 2019).

We also noted that not all resources (space and equipment) were used. Teachers dedicated more attention and time to the disciplines they felt they were better trained at (i.e. more comfortable with), although they allowed children to freely practice other disciplines where the teacher had a more limited knowledge (e.g. unicycle). Some of the initial equipment purchased (e.g. juggling clubs and rola-bola) were not easily adaptable for the range of students in an elementary setting (e.g. different size, shape, weight), making practice and progressions challenging at times for some students. Most circus equipment was designed for adult-sized people and there is a global need to adapt these pieces of equipment to children and youth.

Teachers reported that several of their students were so interested in the activities that they sought to acquire their own equipment (e.g. unicycle, diabolo, flower-stick) to be able to practice more at home. The increase in practice time has already allowed us to see results, with children riding unicycles competently or with positive progressions in basic skills on rola-bola, diabolo or Chinese plate spinning. In fact, circus lunch time programs (clubs) emerged in two of the schools, and this became a sought-after inclement weather indoor recess opportunity.

In a collective and participatory way, everyone helped in assembling and disassembling the equipment. As would be seen in artists after each show, the students did this without complaining, perhaps motivated by the idea that there would be another show soon. There were times that the level of student engagement was so high, that even after the teachers' request to finish the activities and put everything away, many were practicing a little more trying to delay the cleanup, behavior that clearly indicates individuals who are engaged and very motivated.

Pedagogical strategies

Three pedagogical strategies seemed to form the basis of the circus arts instruction implementation. As an introduction to circus arts and the disciplines, the initial classes were focused on a teacher directed, prescriptive teaching approach. Theoretical lessons, which include videos and circus projections, complemented this introductory phase as a tool for instruction on disciplines and adequate safety. After this introduction, and within three to five weeks, classes were frequently based on circus circuits (stations) with self-interest rotation. Following the recommendation from the National Circus School training, schools included pedagogical tips (small cards) on the gymnasium wall, providing illustrations on possible progressions (to make the skill less or more challenging), which were

constantly visited by the students. Schools also employed QR codes linked to YouTube videos with tablets for self-directed progressions as well.

Our observation of the circus circuit classes showed very high participation rates, at almost 100%. The circuit with different stations offered a self-training experience based on a pedagogy of discovery allowing for more autonomy of the students from teachers. The students under the teachers' supervision assembled the circuit stations, and after that, they would move from one station to another, usually freely, some already showing greater interest for a particular circus discipline.

The diversity of disciplines and progressions offered to children (e.g. acrobatics, juggling, balancing, aerials) seemed to be enough to cover all individual motivations and interests; a level of challenge for all abilities, and a type of challenge for all interests. After almost a year since the beginning of implementation, it is already noticeable that some disciplines have become more popular than others. The rola-bola, flower-sticks, stilts, and collective acrobatics (pyramids) were some of the most popular among students. For that reason, teachers indicated the need to increase their training in these disciplines, as they were beginning to feel that their initial training was not enough for the level the students were beginning to reach in these favorite disciplines. Two teachers even said that the students' greatest interest and motivation brings to them a good problem: the desire to learn more and continue to progress as a teacher. This is also where collaboration among peers became apparent. Students with a strong mastery in some circus disciplines (e.g. unicycle, rola-bola, etc.) acted as mentors in class, helping the teacher and motivating their peers with new challenges. In some way, these students acted as empowered leaders helping in the dynamics and progressions of the activities for others. This peer-to-peer teaching also extended to classmates with different physical or cognitive abilities, where students worked together to find ways for them to become engaged and perform the skills themselves.

Several children spontaneously commented that they prefer circus classes compared to other activities. Within the circus disciplines, they found more freedom to play and explore countless skills in a creative way, and this ownership of the movement certainly fostered commitment. The idea of having new incremental challenges every day became the principle motivation for students to stay engaged in improving from one class to the next. In fact, many children used their lunchtime to practice even more.

Overall, a high gender balance in class participation was observed consistent with that reported in a Brazilian circus study (Bortoleto et al. 2020) and a circus study in public schools in Canada (Kriellaars et al. 2019). Perhaps the only exception was to the aerial disciplines (trapeze and silk) that captured the interest of the girls in the class. We have seen children gain a level of mastery in some skills, then proceed to combine them with other skills from other disciplines (e.g. juggling on the rola-bola, or juggling on stilts). This combination of skills was partly strategic in the placement of equipment by the teachers (e.g. placing juggling balls next to rola-bola), but the skills combination also at times arose naturally as students explored new possibilities of sequences of movement or combination of movements across disciplines. Teachers didn't have to give permission to be creative, the positive fostering of creativity without judgment was readily accepted by the children. In fact, it appeared that both students and teachers began to view the equipment as affordances fueled by a creative pursuit of new ways, opening their minds to new possibilities and unconstrained by conventional use. These observations are consistent with a recent framework proposed by Richard, Holder, and Cairney (2021) about the role of fostering creative potential through movement. The teachers remarked about being freed up from prescriptive progressions, instead allowing for student self-exploration to guide progression. These classes shared many features that are promoted in non-linear pedagogy (NLP) research (Rudd, Strafford, and Davids 2020). In particular, circus provided for some of the key principles of NLP including task variability and task constraint where the student would necessarily be encouraged to modify the task, the environment or the way in which they perform the task (e.g. eyes closed).

Discussion

The aim was to explore the implementation of circus arts instruction in PE classes in Manitoba, Canada through a multiple case study lens. Overall, we identified various aspects that make circus arts instruction in PE a unique and impactful experience for all. Based on the themes; a shift in pedagogy, teacher training in circus, facilities and equipment, and pedagogical strategies, we suggest that circus arts instruction in public school PE classes is a highly inclusive approach to PE that necessarily allows ‘everyone to find their shoes, grow in their shoes and use their shoes’- Patrice Aubertin (CRITAC Director), regardless of their gender, age, or ability. The lower participation rates often observed during traditional PE (Metcalf 2018) compared to the increased level of student participation and engagement reported by teachers during a circus class is a critical finding, but not new. Previous studies have indicated the positive impacts of circus arts instruction on the inclusion of all students (Burkel 1969; El-Sherif 2014; Kriellaars et al. 2019; Bolton 2004), while still allowing for curricular outcomes to be met (Bolton 2004; Price 2012; Kriellaars et al. 2019). Not only did circus arts instruction in PE lead to a more inclusive PE experience, but it also resulted in a more collaborative school environment, where PE teachers were working with their colleagues (e.g. music and drama teachers). The formation of professional learning communities, as seen in this circus arts implementation, allows for improved teaching practices and student learning (Battersby 2019; Telford et al. 2020). Perhaps this is also responsible for the contagion effect where circus arts instruction has migrated to so many schools within the division. Similarly, teachers felt strongly supported by administrators (principals and superintendents) in their circus arts instruction implementation, which is found to be a critical aspect to successful implementation of novel ideas in the school context (Spohn 2008). This collaborative school community also extended beyond the teachers, where we saw parents becoming more engaged with school activities (e.g. winter concert) for the first time. Principals remarked that they had never observed such a high parental attendance at these events, so much so that it was standing room only! Previous research indicates the disconnect between parents and teachers when it comes to movement opportunities in the school context (Rickwood, Temple, and Meldrum 2011), the increased engagement we observed from parents and teachers through the circus implementation may help mediate this challenge and help to reverse a movement suppressed school culture.

Based on their training at the National Circus School, the teachers not only learned how to incorporate circus into their teaching, but also to deliver physical literacy enriched pedagogical practices. Physical literacy enriched pedagogy has broad applicability to other movement contexts which would necessarily result in increased intentional design in lesson planning, a greater level of inclusion in lesson plans, increased capacity to retain and progress students, and provides for a shift away from a solely technical movement based focus to include other necessary components of movement (e.g. psychological, creative) (Cairney et al. 2019; Stuckey et al. 2021).

Physical literacy enriched pedagogy practices apparent in the circus arts instruction implementation included opportunities for a level of challenge for every level of ability (Jefferies 2020), genuine connection, teamwork, and empathy among peers (Everley 2021; Malinin 2019; Richard, Holder, and Cairney 2021), opportunities for creative movement (Richard, Holder, and Cairney 2021), confidence/competence progressions (Stuckey et al. 2021), and high level of engagement (active participation) for all (Stoddart et al. 2021). To date, various successful physical literacy interventions exist within the school context (e.g. Coyne et al. 2019; Invernizzi et al. 2019; Kriellaars et al. 2019; Stoddart et al. 2021), providing early evidence of the potential of physical literacy enriched pedagogy exemplified by circus arts instruction.

Conclusion

Befitting the circus adage ‘everyone is welcome under the big top’, circus arts instruction in PE was capable of addressing some key equity issues by combatting the gender gap in motor competence,

by providing a level of challenge for a wide range of physical and cognitive abilities. This multiple case study of circus arts implementation offers a prime example of the activation of the physical literacy engine (competence→confidence→motivation→active participation) (Stuckey et al. 2021). Although there is still a need for further exploration, we believe that the physical literacy enriched pedagogy practices observed through circus arts instruction have the potential to positively impact various aspects of a child's wellbeing.

Future research should explore the potential carryover effects of the physical literacy focused competencies developed by teachers trained at the National Circus School, and their pedagogical practices beyond circus arts. Further, these promising findings have potential future research opportunities to explore whether this approach can be applied in other schools and grades, with other teachers. Exploration of CAI implementation in other schools will be critical to better understand the breadth of applicability of the approach and training.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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