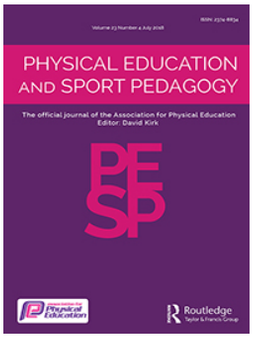

Physical Education and Sport Pedagogy

ISSN: 1740-8989 (Print) 1742-5786 (Online) Journal homepage: http://www.tandfonline.com/loi/cpes20

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To cite this article: Nalda Wainwright, Jackie Goodway, Margaret Whitehead, Andy Williams & David Kirk (2018) Laying the foundations for physical literacy in Wales: the contribution of the Foundation Phase to the development of physical literacy, Physical Education and Sport Pedagogy, 23:4, 431-444, DOI: 10.1080/17408989.2018.1455819

To link to this article: https://doi.org/10.1080/17408989.2018.1455819

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PHYSICAL EDUCATION AND SPORT PEDAGOGY, 2018
VOL. 23, NO. 4, 431–444
https://doi.org/10.1080/17408989.2018.1455819

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Laying the foundations for physical literacy in Wales: the contribution of the Foundation Phase to the development of physical literacy

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ABSTRACT

Background: The Foundation Phase in Wales is a play-based curriculum for pupils aged 3–7 years old. Children learn through more holistic areas of learning in place of traditional subjects. As such, the subject of physical education in its traditional form no longer exists for pupils under the age of 7 in Wales. In light of the role of physical education in developing physical literacy and in particular the importance of this age group for laying the foundations of movement for lifelong engagement in physical activity, the disappearance of physical education from the curriculum could be deemed to be a concern.

Purpose: The purpose of this study was to explore the Foundation Phase as a naturalistic intervention and examine its contribution to the development of physical literacy.

Participants and setting: Participants included year 1 pupils ($N = 49$) aged 5 and 6 from two schools in contrasting locations. A smaller group within each class was selected through purposive sampling for the repeated measures assessments ($N = 18$).

Research design and methods: A complementarity mixed-method design combined quantitative and qualitative methods to study the Foundation Phase as a naturalistic intervention. Quantitative data were generated with the Test of Gross Motor Development-2 administered to the sample group of children from both schools as a quasi-repeated measure, the physical competence subscale of the Pictorial Scale of Perceived Competence and Social Acceptance and the Leuven Involvement Scale for Young Children. Qualitative data were generated throughout the study from the analysis of video and field notes through participant observation. Data from the mixed methods were analysed through complementarity to give a rich insight into pupils' progress and experiences in relation to physical literacy.

Results: Overall analysis of the data from TGMD-2 showed significant improvements in the Gross Motor Quotient and Locomotor skills from T1 to T3, but no significant improvement in object control. Data from qualitative methods were analysed to explore processes that may account for these findings. Video and field notes complement the quantitative data highlighting that children were developing their locomotor skills in many aspects of their learning. Observations using

ARTICLE HISTORY
Received 6 July 2017
Accepted 19 February 2018

KEYWORDS
Physical education; physical literacy; motor development; early childhood; play; pedagogy

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the Leuven Involvement Scale indicated that children had high levels of involvement in their learning and apparent in video and field notes was pupils' motivation for movement. Paired sample *t*-tests ($N = 18$) conducted on the Harter and Pike perceived physical competence six-item score subscales (T1 and T3) indicated a significant difference in the mean perceived physical competence scores on the six-item scale between T1and T3. Qualitative data explored pupils' confidence for movement in many areas of learning.
Conclusion: The combination of quantitative and qualitative data indicates that the Foundation Phase is an early childhood curriculum that lays the foundations of physical literacy with the exception of aspects of the physical competence, specifically object control skills. Although these skills only contribute to psychomotor aspects of physical literacy they are strongly associated with later engagement in physical activity. The development of specific physical skills such as object control skills may need more specialist input with early childhood pedagogy teachers trained in motor development to see significant improvements.

Introduction

The Foundation Phase in Wales is a child-centred curriculum for pupils aged 3–7 years that advocates learning through 'first-hand experiential activities with the serious business of play providing the vehicle' (DCELLS 2008, 4). The introduction of this play-based curriculum in 2008 follows a worldwide trend within education systems which sees subject matter clustered into more holistic areas of learning that extend beyond traditional subjects; as such, physical education as a subject no longer exists in Wales for pupils under the age of 7 (DCELLS 2008; Macdonald 2003; Maynard 2007; Wainwright et al. 2016).

Research in the field of motor development highlights the importance of early childhood in the laying of foundations for lifelong physical activity (Barnett et al. 2009, 2016; Clark and Metcalf 2002; Stodden et al. 2008) and in light of the importance of physical education for the development of physical literacy (Hardman 2011; Talbot 2007; Whitehead 2010) the loss of physical education as a subject for all pupils in Wales under the age of 7 could be viewed as a cause for concern. However, the play-based nature of the curriculum means that physicality is central to all learning and many of the attributes of physical literacy may well be developed through this holistic approach to learning.

This paper explores the discourse around physical education and physical literacy. It highlights implications for the Foundation Phase in relation to physical literacy before reporting aspects of an in-depth study of the implementation of the Foundation Phase and its contribution to pupils' physical literacy. Findings are reported in relation to the attributes of physical literacy of 'motivation, confidence and physical competence and effective interaction with the environment' which 'are the three attributes that form the kernel of the concept and are mutually reinforcing' (Whitehead 2010, 14).

Physical education and physical literacy

The nature and purpose of physical education has and continues to be the focus of much debate (Brown 2013; Hastie 2017; Kirk 2010). A growing body of literature calls for learning in physical education to be authentic, relevant to learners and holistic in nature (Brown 2013; Haerens et al. 2011; Kirk 2010; Stolz 2013). Contributing to this debate is the concept of physical literacy (Dudley 2015; Jurbula 2015; Whitehead 1990, 2010, 2013), which Whitehead defines as 'the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life' (Whitehead 2016). Physical literacy is recognised in the literature,

research and policy as an outcome of physical education (Hardman 2011; Talbot 2007). Whitehead expresses the philosophical belief from existentialism and phenomenology that embodiment is central to human existence, which Bresler (2004, 7) defines as 'the integration of the physical or biological body and the phenomenal or experiential body'.

Although Brown and Payne (2009, 419) suggest 'the contribution of phenomenology to the physical education discourse is and remains on the margins', there is a growing discourse in the fields of physical education and philosophy concerned with embodiment in physical education, sport and the construction of the self (Birch 2009; Block and Weatherford 2013; Brown 2013; Brown and Payne 2009; Hopsicker 2009; Stolz 2013). Stolz (2013, 950) in particular is critical of the academisation of physical education, suggesting that this has led to a disconnect in physical education from its purpose 'to develop each person's whole being' and both Stolz (2013) and Whitehead (2010) draw on the work of Merleau-Ponty who argues humans do not view the world from outside, but are themselves part of it and as such are 'beings-in-the-world' (Merleau-Ponty 1962, 58). As such humans 'create themselves as they interact with their surroundings' and are 'forever in an active relationship with the world known as intentionality' (Whitehead 2010, 26). Whitehead (2010, 26) further explains that 'the intentionality in which our embodiment plays the leading role is known as operative intentionality'. This is of particular significance in relation to the nature of the Foundation Phase as a play-based curriculum, where children's operative intentionality is the means for them to learn about the world and their place as part of it. Indeed, young children at play is perhaps one of the most obvious examples of the innate drive to interact with the world where the relationship between perception and movement function inseparably as children construct their understanding of themselves (Merleau-Ponty 1962).

The Foundation Phase

The Foundation Phase is a play-based, holistic, child-centred approach to education for children aged 3–7, underpinned by childhood well-being (DCELLS 2008). Influenced by a range of international approaches such as *Reggio Emilia* in Northern Italy, *Te Whāriki* in New Zealand and *Forest Schools* in Scandinavia an appropriate learning environment is central to Foundation Phase provision. Curriculum documentation advocates the use of indoor and outdoor spaces which are exciting, fun, stimulating and safe, and which promote discovery and independence (DCELLS 2008). The 'use of the outdoors for learning' is one of four key features of the Foundation Phase, along with 'play and active learning' 'child-initiated learning' and 'focused adult led sessions' (Wainwright et al. 2016). These key features are evident across all learning which often sees literacy and numeracy activities taking place outside in the form of treasure hunts or other such activities in stark contrast to traditional learning at desks.

The outdoor environment as a valued resource for children's learning is well recognised (Maynard and Waters 2007; Waite 2010) with research focused on learning in the natural environment demonstrating increased levels of physical activity (Mygind 2007) and improved motor development (Fjørtoft 2004). Maude (2010) suggests there is overwhelming evidence for the benefits of both indoor and outdoor play for providing opportunities for children to develop awareness and understanding of their embodied dimension. As Broadhead (2004, 89) explains, for children, interaction with the environment through play is 'a holistic exploration of who and what they are and know' and it is how they explore who and what they may become. This understanding of play aligns with a monist philosophical perspective of 'viewing the person as essentially an indivisible whole', which is 'fundamental to the appreciation of the concept of physical literacy' (Whitehead 2010, 22).

Playful pedagogy

The Welsh Government recognises the importance of play as a way 'children become self-aware' and 'learn social rules' as well as being 'fundamental to intellectual development' (DCELLS 2008, 6).

Table 1. Cues that children use to distinguish between play and work.

Play		Work	
Emotional cues	Environmental cues	Emotional cues	Environmental cues
Voluntary	On the floor	Compulsory	At a table
Under child's control	Lacks adult involvement	Under adult control	Includes adult involvement
Easy	No adult evaluation	Hard	Includes adult evaluation
Fun	Can be continued focus on the process	Can be fun	Has to finish focus on the product
	Physical		Not physical

However, Wood and Attfield (2005, 5) emphasise that defining play is problematic as it 'is always context dependent' and can be in many different forms. As a play-based curriculum, the interpretation of play in the Foundation Phase is not clearly defined. Howard and McInnes (2010, 34) suggest that 'viewing playfulness, as an attitude of mind, rather than play, the outward act, may be the most helpful way of thinking about this elusive concept and of providing a theoretical basis for implementing a play-based curriculum' such as the Foundation Phase. They further propose that utilising a concept of play which is based on children's perceptions, highlighting playfulness as an approach and attitude to an activity may help to develop practitioners' understanding of play. Howard and McInnes (2010, 35) highlight how children make the distinction between work and play with clear cues illustrated in Table 1.

McInnes et al. (2009, 122) propose that it is not whether the activity is play or not that is the issue, but rather 'the playful approach and attitude that is taken to an activity'. Although the experiences in the Foundation Phase are in the main conceived, designed and introduced by teachers, it is the choices about how they engage with tasks that make the learning experiences playful. Maude (2010, 111) highlights the important relationship between play and physical literacy, as she explains that play 'facilitates the establishment of many of the other attributes that are characteristic of a physically literate individual, including motivation, confidence, environmental and interpersonal engagement, self-knowledge and self-expression'. The notion of playful pedagogy where children learn in a way that they perceive as play is seen in the Foundation Phase across all areas of learning, thus maintaining motivation and engagement in the task (Howard and McInnes 2010; Wainwright et al. 2016).

The links between play and high levels of involvement and intrinsic motivation have been well documented (Brock et al. 2009; Howard and McInnes 2010; Moyles 2010). By using a playful pedagogy teachers create an autonomy supportive climate (Hastie, Rudisil, and Wadsworth 2013). Deci et al. (1991) emphasise the significance of an autonomy supportive climate in determining the level of self-determination and intrinsic motivation. Motivation is strongly related to engagement and this concept is important to this study. Reeve et al. (2004) considered it to represent a behavioural pathway of motivational processes that contributes to students' subsequent learning and development and as such predicts underlying motivation, an attribute of physical literacy.

Physical development

Although physical literacy is far broader than the attribute of physical competence, literature from the field of motor development and health highlight the importance of early childhood for laying the foundations of physical development and the physical competence needed for later engagement in more structured physical activity and sport (Barnett et al. 2009; Barnett et al. 2016; Clark and Metcalf 2002; Stodden et al. 2008). Although there is some evidence that play in a natural environment will develop physical competence, it is a misconception that through just playing, physical competence will simply occur naturally (Altunsöz and Goodway 2015; Barnett et al. 2016; Gallahue, Ozmun, and Goodway 2012; Haywood and Getchell 2009). For children to realise the full potential of their movement vocabulary, they need developmentally appropriate structured opportunities with informed feedback (Altunsöz and Goodway 2015; Goodway and Branta 2003; Maude 2010). Although the Foundation Phase is a play-based curriculum featuring 'child-initiated learning' the curriculum

Table 2. Research design.

Phase 1				Phase 2				Phase 3
Feb.–May Yr1	June Yr 1	July Yr 1	Nov. Yr1	Dec. Yr 1	Feb. Yr 2 T1	July Yr 2 T2	Dec. Yr 2 T3	Jan. Yr 3
Documentary analysis	Pilot interview	Semi-structured interviews	Respondent validation	Pilot instruments	TGMD-2 Harter scale	TGMD-2 Semi-structured interview teachers school A & B Participant observation Leuven involvement Video	TGMD-2 Harter scale	Analysis of schools' data, with data from phase 2

does still retain 'focused adult led sessions' which despite the lack of physical education as a subject does give opportunities for the structured teaching for the development of physical competence (Wainwright et al. 2016).

From this literature, it could be argued that despite the loss of physical education in its traditional form, the play-based active nature of the Foundation Phase may still make a positive contribution to the development of attributes of physical literacy. The following section reports on data drawn from a larger study of the contribution of the Foundation Phase to the development of physical literacy.

Research design

To gain a deep understanding of the complexities of the Foundation Phase curriculum and its contribution to the holistic concept of physical literacy, a mixed-method pragmatist approach was required. The study combined quantitative and qualitative paradigms in a complementarity mixed-method design enabling the measurement of overlapping and also different facets of learning to yield an enriched and elaborated understanding of the Foundation Phase as a naturalistic intervention (Greene, Caracelli, and Graham 1989). Drawing on the view that 'epistemological purity does not exist', this study aligned to the view of Onwuegbuzie and Leech (2005, 275) who argue for the terms 'confirmatory and exploratory' in place of quantitative and qualitative therefore seeking to confirm whether outcomes in relation to physical literacy were being achieved and explore how they were being achieved. In so doing it was not concerned with whether the Foundation Phase was the 'cause' of pupil progress but rather explored pupils' experience of the Foundation Phase. This paper reports the findings from phase 2 of a three-phase complementarity mixed-method study. Phase 1 generated inductive data from documentary analysis and interviews to identify expected outcomes of the Foundation Phase related to physical literacy. Findings from phase 1 informed the selection of methods for phase 2. Phase 2 assessed whether and how the physical literacy outcomes were being achieved. Phase 3 explored the relationship between physical literacy and academic achievement. Table 2 shows the research design for the original study. Phase 2 findings only are reported in this paper. Other than the repeated measures, methods were used as and when possible to cause least disruption to the routines of the schools.

Participants

The study aimed to explore the experience of pupils in the Foundation Phase, therefore it was important that practice in the schools was a true representation of that curriculum. As such two schools were selected for the study on the basis of recognition of high-quality Foundation Phase provision by government inspectors and advisors. The schools were in contrasting locations although this was not a condition for selection. School A was a small rural school with a mixed socioeconomic

catchment area. School B was a large urban school with children mainly from low socioeconomic backgrounds.

Data reported in this paper were from a year 1 class in each school. The year 1 class in school A had 23 pupils (13 girls and 10 boys) in total, school B had 26 pupils (14 girls and 12 boys) in total ($N = 49$) aged 5 and 6. All pupils in the two classes were involved in the study and a further smaller group within each class was selected through purposive sampling for repeated measures assessments. The smaller sample group was selected through discussion with the teachers and support staff to obtain a mixed ability sample based on the teachers' judgment of the children's physical competence of top, middle and lower abilities. A total of eight pupils from each school were selected for the repeated measures assessments and two extra in case of absence ($N = 18$).

Ethics

The University code of ethics and BERA Ethical Guidelines for educational research (2004) were adhered to. Voluntary informed consent was sought for all participants, permission from adults responsible for the children and participant assent from the children.

Methods

In the absence of a physical literacy assessment for Foundation Phase age pupils at the time of the study, a range of methods were selected and piloted. The combination of data from the methods was used to confirm and explore pupils' progress in physical literacy outcomes identified in phase 1 of the study as physical competence and interaction with the environment, motivation and confidence.

Physical competence and interaction with the environment was assessed with the Test of Gross Motor Development, second edition (TGMD-2), video and field notes. The TGMD-2 was administered to the sample group of children from both schools ($n = 18$) as a quasi-repeated measure at Time 1 February, Time 2 July and Time 3 December. Administration of the assessment followed the standardised and established guidelines for each participant. Trials of the TGMD-2 were videotaped for coding. TGMD-2 is a criterion- and norm-referenced standardised test that quantitatively assesses the fundamental motor skill (FMS) performance of children between the ages of 3 and 10 years, consisting of 2 subtests measuring object control and locomotor skills (Ulrich 2000). Raw subset scores were converted to standardised scores and combined to give the Gross Motor Quotient (GMQ) which Ulrich (2000, 3) states 'is the best measure of an individual's overall gross motor ability'. Percentiles were calculated as a guide to the relative proficiency of children, however it should be noted that the percentile data were normed on a USA sample and it is not known how appropriate this sample is to Welsh children (there is no normed data in relation to Welsh children). The mean percentile rank overall and for School A and School B revealed that children were typically developing and the average child did not have delays in motor development (less than 25th percentile) in the mean percentile scores. The TGMD-2 provides a valid and reliable measure of fundamental motor skill performance and is a widely used instrument in motor development literature (Goodway and Branta 2003; Valentini and Rudisill 2004).

Video and participant observation field notes further explored pupils' physical competence and interaction with the environment. Video captured the context in particular when many different activities were happening simultaneously. Video observations took place over the year as and when it was possible to fit in with the life of the schools. During phase 2, 29 videos were filmed in School A and 37 were filmed in School B, giving a total of 89 videos.

Participant observation field notes generated data to glean greater understanding of pupils' experiences of the Foundation Phase. Self-reflection supported the use of field notes recorded both in situ and later to ensure 'a detailed record of both objective observations and subjective feelings', maintaining a high level of reflexivity (Spradley 1980, 58). Pages and lines in the field note

journal were numbered clearly in order to have a clear trail of all comments back to their source throughout the process of analysis. A total of 281 pages of field notes were recorded.

Pupil confidence was assessed with the Pictorial Scale of Perceived Competence and Social Acceptance (PSPCSA) for pre-school and kindergarten age children (Harter and Pike 1984) in conjunction with video and field notes (as outlined above). In this study only the physical competence subscale of the PSPCSA was used and although previous research suggests children of this age are inaccurate in their judgements of perceived competence (Goodway and Rudisill 2003), this scale has been used extensively in research with pupils of this age (Robinson 2011; Robinson, Rudisill, and Goodway 2009; Valentini and Rudisill 2004). The six-item physical competence subscale was administered to the sample group of children from both schools ($N = 18$) at Time 1 February and Time 3 December. Each item was scored on a four-point scale, where a score of 4 would be the most competent and a score of 1 would designate the least competent. The mean scores and standard deviations were calculated.

Pupil motivation was assessed using the Leuven Involvement Scale for Young Children (LIS-YC) video and field notes (as outlined above). The LIS-YC is part of the evaluation instrument for identifying engagement and deep-level learning (Laevers 1994). The LIS-YC five-point scale gives a score based on a set of observed behaviour or signals. LIS-YC observations were carried out throughout the study across phase 2 in both schools as opportunities arose in the normal day-to-day life of the Foundation Phase. The assessment was administered as per guidelines in the manual and observations were carried out in activities that were 'the normal course of affairs' (Laevers et al. 2005, 2). Sixty-one LIS-YC observations in total were carried in both schools with 35 different pupils.

Validity, trustworthiness and legitimation

As mixed-method research, this study aligns to multiple validities legitimation, where the use of multiple methods in combination required consideration of how validities were addressed and achieved for each method and in particular in the integration of methods to make the 'whole greater than the sum of its parts' (Onwuegbuzie and Johnson 2006, 293). Internal validity applied to all methods which Onwuegbuzie and Leech (2005, 289) define as 'truth value, applicability, consistency, neutrality, dependability, and/or credibility of interpretations and conclusions within the underlying setting or group'. However, in this study with such small numbers of participants in particular in the repeated measures tests ($n = 18$), external validity claims of generalisation could not be considered valid. In order to address dangers of bias in naturalistic methods, Walker (2012, 78) emphasises the need for 'constant attention to self-reflection and self-critique'. This was achieved throughout the study by the constant keeping of reflections in field notes both in the field and retrospectively. Peer debriefing was also used to aid the process of reflection. In particular during qualitative analysis, attention was not just given to confirming units of meaning but also identified disconfirming units.

Analysis of data

Several analytical strategies were used throughout the study for the integration of data from multiple methods. Typology development combined data from observations and field notes to give an 'explanatory variable for the statistical analysis' (Caracelli and Greene 1993, 235). Extreme case analysis identified examples from the analysis of one data type which were 'pursued via analysis of data of the other type' (Caracelli and Greene, 1993, 235). Data consolidation and merging jointly reviewed different data types to create qualitative narratives from observations and video enabling analysis with interviews that allowed for deeper insights from new data (Caracelli and Greene, 1993, 242). Qualitative data were analysed using the constant comparative method of inductive data analysis (Gray 2014).

Findings and discussion

The analysis of the qualitative and quantitative data found that the Foundation Phase made a positive contribution to the components of physical literacy of competence and effective interaction with the environment, motivation and confidence, with the exception of object control skills.

Physical competence and interaction with the environment

The analysis of data from TGMD-2, video and field notes found that pupils in the Foundation Phase had good levels of physical competence and showed a significant improvement in their locomotor skills. However, object control skills did not improve significantly.

The overall analysis of the data from TGMD-2 showed significant improvements in the Gross Motor Quotient and locomotor skills from Time 1 to Time 3, but no significant improvement in object control. A repeated measures ANOVA was conducted across the three time frames of the study (Time 1, Time 2, Time 3) with a Bonferroni adjustment of the alpha level built into the analyses, in order to adjust for multiple comparisons that took place.

The repeated measures ANOVA was undertaken for the: (1) GMQ, (2) locomotor SS and (3) object control SS for the overall group. The ANOVA with repeated measures for the GMQ revealed a significant multivariate main effect for Time, $F(2,16) = 15.35$, $p < .001$, Eta squared .66. A similar finding was found for the ANOVA with repeated measures for locomotor skills, $F(2,16) = 24.17$, $p < .001$, Eta squared .75. However, for object control skills there was not a significant main effect, $F(2,16) = 3.17$, $p = .069$, Eta squared .28. These findings identify that the significant improvement in the GMQ is related to the significant improvement in locomotor skills whilst object control skills did not show a significant improvement. The research design does not allow for direct attribution as pupils have only had experience of the Foundation Phase and so data from qualitative methods were analysed to explore processes that may account for these findings.

Video and field note observations highlighted that children were developing their locomotor skills in many aspects of their learning and interacting with a variety of environments. For example, a mathematical development session in School A showed how the pupils were developing their locomotor skills whilst engaged in activities as part of a maths trail:

> *After lunch is a maths trail – Easter egg maths trail, Mrs. Smith hides the questions outside around the grounds. Sarah and Ann have their clipboard and jog off to the steps to head up onto the grass. Jo and Cai have theirs and Jo points the way with his pencil "up here, up on the grass" he shouts, Cai has the clipboard under his arm and they run over to the wall and climb up with ease onto the grass. Peter and Dai run past, "where did you see it?" shouts Dai, "up here" says Peter, Dai heads up on the steps and they run across to the football posts near Jo and Cai.* (Field notes school A p72, line 15 – FNA72,15)

> *The children run between cards and find the questions, climbing over and running around the parts of the trim trail' (Video 7 school A clip a – V7Aa). 'They play climbing and swinging for a while then the majority of the class head to 'the mound' and play a running and chasing game up and down. (V7Ae)*

Although the lesson had been planned as an activity for mathematical development, the children were using locomotor skills throughout. Not only did the activity of a trail (in essence an early form of orienteering) encourage the pupils to run, but the use of the natural terrain and the obstacles of the trim trail meant that children were running, climbing, leaping and jumping, demonstrating the type of activities that Fjørtoft (2004) highlights as vehicles for motor development.

Field notes also identified occasions when pupils demonstrated object control skills such as during a free choice activity session '*Llion plays football, Megan plays with a hoop and target game. Iestyn is playing with a bat and ball whilst Elin is making a game with skittles a bean bag and ball*' (FNB 60, 14). The children played these activities independently with no intervention from the teacher. There were also opportunities to practice throwing skills in areas of the curriculum such as mathematical development where the '*children throw the bean bags into tens or units bucket – their partner must say what number they have made to get a score*' (FNA 101, 2). Planned whole class physical

development sessions using ball skills were also observed. However, teacher intervention was limited and did not include structured feedback in relation to developmental stages of skills, '*Sara's throwing is erratic, she throws over-arm too hard – Sue* (the teacher) *says she may be better underarm – she is much better*' (FNA 101, 17).

Literature highlights that the development of physical skills requires teacher input and does not just happen naturally (Goodway and Branta 2003). Fundamental motor skill development is complex. Teachers and coaches can manipulate different factors or constraints to influence the development of a new skill and 'promote motor development of children' (Gallahue, Ozmun, and Goodway 2012, 187). Limited teacher intervention as highlighted in field notes may have impacted on pupils' development of object control skills. The relationship between physical competence and physical activity is well documented (Barnett et al. 2016; Clark and Metcalf 2002; Stodden et al. 2008) and children proficient in object control skills are more likely to be physically active adolescents (Barnett et al. 2009). Therefore, these findings raise questions about the Foundation Phase and implications for lifelong physical activity.

Motivation

The analysis of data from Leuven Involvement Scale, video and field notes found that pupils were highly engaged in their learning and motivated to move in a variety of contexts. Leuven Involvement Scale observations assessed the levels of the pupils' involvement in their activities and as such contributed to the assessment of their motivation and engagement. The Leuven scale is scored from 1 to 5 with 1 being extremely low where the child's activity is simple, repetitive and passive, and 5 being extremely high where the child shows continuous and intense activity revealing the greatest involvement (Laevers 2000). Table 3 shows the scores for observations using the Leuven Involvement Scale.

The mean score of 3.7 indicates that children had high levels of involvement in their learning as can be seen in Table 4. 58.09% of all observations were scored in the high/very high category and only 16.1% were in the very low/low category. These findings were high in relation to previous research where post-test scores after an intervention to improve involvement were 3.47 (Laevers and Declercq 2011).

Observations were categorised in relation to teacher directed and child choice as shown in Table 5. A Chi-squared analysis was undertaken to examine if engagement levels were different in teacher selected task or child selected task. The categories of very low and low were combined and high

Table 3. Scores for observations using the Leuven Involvement scale.

	Total	Score 5 Extremely high	Score 4 High	Score 3 Moderate	Score 2 Low	Score 1 Extremely low	Mean score
No. of observations	56	17	16	14	8	1	3.7
% of observations	100%	30.4%	28.6%	25%	14.3%	1.8%	

Table 4. Percentage of observations in each category of the Leuven Involvement scale.

Category of involvement score	High/very high engagement 4 and 5	Moderate engagement 3	Low/very low engagement 1 and 2
Percentage of observations	59%	25%	16%

Table 5. Involvement scores and percentage per category.

	Involvement			
Task	Very low/low involvement	Moderate involvement	High/very high involvement	Total
Directed	24.1%	34.5%	41.4%	100.0%
Choice	7.4%	14.8%	77.8%	100.0%

and very high were combined in order to have large enough numbers of the Chi-squared analysis, although two cells were still below 5. The Chi-squared analysis found higher levels of engagement in tasks that the child selected with significance of $p = .021$. The data indicates higher levels of involvement for pupil directed tasks. This supports previous studies where autonomy support – defined as valuing 'self-initiation', 'children's choice, independent problem solving and participation in decision making' – is strongly associated with intrinsic motivation (Deci et al. 1994, 123; Ryan and Deci 2000).

Field note data complement these findings with observations commenting on pupil engagement across a range of activities. High levels of engagement were particularly evident in child choice activities as it was '*quite remarkable to see how busy, focused and engaged the children were during the free choice time*' (FNB 92, 11). The consistent theme with this curriculum was high levels of engagement by the majority of pupils most of the time. Even in teacher-led activities when children were less engaged, the levels of engagement were still high with 76.9% of observations for the teacher-directed tasks still in the moderate to very high categories. This may have been related to the playful nature of the tasks, as activities included cues that children associate with play (Howard and McInnes 2010). In particular tasks were often outside, fun and involved moving around.

The motivation for movement can be both extrinsic and intrinsic, but of particular importance to the development of pupils' physical literacy is 'embodiment-as-lived' and physical experiences for their own intrinsic worth (Brown 2013; Whitehead 2010, 2). This was evident throughout the children's learning. Video in School A showed,

> *Stuart, observing the children making boats for the stones to float in was very excited … He jumps up and down on the spot and skips excitedly saying "wow that would be impossible". His actions are a visible expression of his excitement and he skips off to another activity.* (V1, A)

In free play

> *Lily is doing yoga stance in the playground and Ann is on the grass alongside the trim trail, she is cartwheeling over and over again. Some of the other children are on the trim trail spinning around the rope or hanging from the bars. Children run in and out of the willows and they seem to be enjoying the freedom of just running as there does not appear to be any game that they are playing.* (FNA 67, 21)

The analysis of complementary data suggests that children consistently demonstrated movement responses in their daily activities. The nature of the curricula environment in which they were learning appeared to afford opportunities for children to respond in this way. Thus the Foundation Phase curriculum and children's responses to it 'resonate with embodied competences' with children knowing 'intuitively how to move' (Whitehead 2010, 51).

Confidence

The analysis of data from the Pictorial Scale of Perceived Physical Competence video and field notes found that pupils' perception of their own physical competence improved significantly between Time 1 and Time 3 and they were confident to move in a variety of contexts during many aspects of their learning. Paired sample *t*-tests ($N = 18$) were conducted on the Harter and Pike perceived physical competence six-item score subscales across the Foundation Phase (Time 1 and Time 3). The mean score at Time 1 was 3.14 equating to a child who thought they were 'pretty good' in the area of physical competence. The mean score at Time 3 was 3.34 also equating to the 'pretty good' category in physical competence. There was a significant difference in the mean perceived physical competence scores on the six-item scale between Time 1 (M = 3.14, SD = .43) and Time 3 (M = 3.34, SD = .36); $t(17) = -2.69$, $p = .016$.

Interestingly, pupils viewed themselves as 'pretty good' and their scores on the six-item scale improved significantly between Time 1 and Time 3. Previous research indicates that interventions to develop physical competence, when delivered in a mastery motivational climate, have a significant

impact on perceived physical competence (Logan et al. 2013; Robinson 2011; Valentini and Rudisill 2004). Although in this study there was no intervention, the Foundation Phase is a highly active play-based curriculum where pupils have high levels of physical activity. The autonomy supportive approach of the Foundation Phase along with these high levels of physical activity may have resulted in them perceiving themselves to be highly physical beings and as such see themselves as physically competent. These high levels of perceived competence are important in relation to engagement in physical activity and as such to the development of physical literacy.

Field notes show that children were highly engaged in physical activity across many areas of learning and across phase 2 of the study from Time 1 to Time 3. During a maths session outside '*Elin runs around saying she is doing shapes using the language "curved*"' (FNB 52,11). Pupils were active in their learning and happy to engage in physical activity, '*Sean and Llion climb into and out of the boat. Carter and Nicole play a chasing game*' (FNB 205, 21).

> *Tom and Carter run together, Tom says "amazing" they are in a quiet section and seem to be devising a game. Carter leads and Tom follows. They are playing some sort of pretending game … They progress the same game into a bigger area doing the sound effects as they climb, run, jump and crawl all around.* (FNB 169, 20)

The perception of physical competence is related to motivation to engage in physical activity (Stodden et al. 2008). Physical literacy is developed through engagement in physical activity and also contributes to engagement in physical activity. Therefore, children's perceptions about their physical competence are an important factor in the development of physical literacy.

Limitations of the study

Despite efforts by Welsh Government to implement the Foundation Phase in all schools in Wales, an independent stocktake identified that many schools are not implementing this play-based curriculum (Siraj 2015). Therefore, it should be noted that schools in this study were chosen specifically due to the recognition of high-quality Foundation Phase provision. The numbers of pupils in the samples were small and as such this limits the conclusions that can be drawn and the generalising of the findings to the wider population. More research is needed into the impact of this curriculum on children's physical literacy, in particular in light of future developments in Wales which will all subjects replaced with more holistic Areas of Learning and Experience similar to the Foundation Phase for all children (Donaldson 2015).

Conclusion

The Foundation Phase curriculum in Wales gave a unique opportunity to study the impact of a naturalistic intervention. Findings suggest that the holistic play-based Foundation Phase with its active embodied learning and use of the outdoors enabled pupils to interact with a diverse range of environments through many areas of learning contributing to locomotor skills, engagement in learning and perceived physical competence. The analysis of data from multiple mixed methods data suggested that the Foundation Phase as an early childhood curriculum lays the foundations of physical literacy with the exception of some aspects of the attribute of the physical competence. In particular, this study found that in terms of pupils' motor development there was no significant improvement in object control skills.

The physical play-based approach to learning afforded opportunities across many areas of learning for experiences that were traditionally delivered in physical education. However, although the Foundation Phase contributes to the development of physical literacy, the development of specific physical skills in relation to motor development such as object control skills may need more specialist input raising questions about professional development for early childhood teachers and practitioners.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Altunsöz, I., and J. Goodway. 2015. "SKIPing to Motor Competence: The Influence of Project Successful Kinesthetic Instruction for Pre-Schoolers on Motor Competence of Disadvantaged Pre-Schoolers." *Physical Education and Sport Pedagogy* 21 (4): 366–385.

Barnett, L., D. Stodden, K. Cogen, J. Smith, D. Lubans, M. Lenoir, S. Livonen, et al. 2016. "Fundamental Movement Skills: An Important Focus." *Journal of Teaching in Physical Education* 35 (3): 219–225.

Barnett, L., E. van Beurden, J. Morgan, L. O Brooks, and J. Beard. 2009. "Childhood Motor Skill Proficiency as a Predictor of Adolescent Physical Activity." *Journal of Adolescent Health* 44 (3): 252–259.

Birch, J. 2009. "A Phenomenal Case for Sport." *Sport, Ethics and Philosophy,* 3 (1): 30–48.

Block, B., and G. Weatherford. 2013. "Embodied Identities: Using Kinesiology Programming Methods to Diminish the Hegemony of the Normal." *Quest,* 65 (1): 31–43.

Bresler, L. 2004. *Knowing Bodies, Moving Minds: Towards Embodied Teaching and Learning*. Netherlands: Kluwer Academic publishers.

Broadhead, P. 2004. *Early Years Play and Learning: Developing Social Skills and Cooperation*. London: Routledge.

Brock, A., S. Dodds, P. Jarvis, and Y, Olusoga, eds. 2009. *Perspectives on Play Learning for Life*. Harlow: Pearson.

Brown, T. D. 2013. "A Vision Lost? (Re) Articulating an Arnoldian Conception of Education "in" Movement in Physical Education." *Sport, Education and Society,* 18 (1): 21–37.

Brown, T. D., and P. G. Payne. 2009. "Conceptualizing the Phenomenology of Movement in Physical Education: Implications for Pedagogical Inquiry and Development." *Quest (grand Rapids, Mich)* 61 (4): 418–441.

Caracelli, V. J., and J. C. Greene. 1993. "Data Analysis Strategies for Mixed-Method Evaluation Designs." In *The Mixed Methods Reader*, edited by V. Plano Clark, and J. Creswell, 229–250. Thousand Oaks, CA: Sage Publications.

Clark, J. E., and J. S. Metcalf. 2002. "The Mountain of Motor Development: A Metaphor." In *Motor Development: Research and Review*, vol. 2, edited by J. E. Clark, and J. H. Humphrey, 62–95. Reston, VA: NASPE Publications.

DCELLS. 2008. *Framework for Children's Learning for 3 to 7-Year-Olds in Wales*. Cardiff: Welsh Assembly Government.

Deci, E. L., H. Eghrari, B. C. Patrick, and D. R. Leone. 1994. "Facilitating Internalization: The Self-Determination Theory Perspective." *Journal of Personality,* 62 (1): 119–142.

Deci, E. L., R. J. Vallerand, L. G. Pelletier, and R. M. Ryan. 1991. "Motivation and Education: The Self-Determination Perspective." *Educational Psychologist* 26 (3): 325–346.

Donaldson, G. 2015. *Successful Futures – Independent Review of Curriculum and Assessment Arrangements in Wales*. Cardiff: Crown.

Dudley, D. 2015. "A Conceptual Model of Observed Physical Literacy." *The Physical Educator* 72: 236–260.

Fjørtoft, I. 2004. "Landscape as Play-Scape: The Effects of Natural Environments on Children's Play and Motor Development." *Children Youth and Environments,* 14 (2): 21–44.

Gallahue, D. L., J. C. Ozmun, and J. D. Goodway. 2012. *Understanding Motor Development: Infants, Children, Adolescents and Adults*. 7th ed. Boston: McGraw-Hill.

Goodway, J. D., and C. F. Branta. 2003. "Influence of a Motor Skill Intervention on Fundamental Motor Skill Development of Disadvantaged Preschool Children." *Research Quarterly for Exercise and Sport,* 74 (1): 36–46.

Goodway, J. D., and M. E. Rudisill. 2003. "Perceived Physical Competence and Actual Motor Skill Competence of African American Preschool Children." *Adapted Physical Activity Quarterley* 20 (3): 298–314.

Gray, D. 2014. *Doing Research in the Real World*. London: Sage.

Greene, J. C., V. J. Caracelli, and W. F. Graham. 1989. "Toward a Conceptual Framework for Mixed-Method Evaluation Designs." *Educational Evaluation and Policy Analysis,* 11 (3): 255–274.

Haerens, L., D. Kirk, G. Cardon, and I. De Bourdeaudhuij. 2011. "Toward the Development of a Pedagogical Model for Health-Based Physical Education." *Quest,* 63 (3): 321–338.

Hardman, K. 2011. "Physical Education, Movement and Physical Literacy in the Twenty-First Century: Pupils" Competencies, Attitudes and Behaviours." Paper presented at the 6th FIEP European Congress, Porec, Croatia, 18–21 June.

Harter, S., and R. Pike. 1984. "The Pictorial Scale of Perceived Competence and Social Acceptance for Young Children." *Child Development,* 55 (6): 1969–1982.

Hastie, P. 2017. "Revisiting the National Physical Education Content Standards: What Do We Really Know About Our Achievement of the Physically Educated/Literate Person?" *Journal of Teaching in Physical Education* 36: 3–19.

Hastie, P., M. Rudisil, and D. Wadsworth. 2013. "Providing Students with Voice and Choice: Lessons from Intervention Research on Autonomy Supportive Climates in Physical Education." *Sport Education and Society* 18 (1): 38–56.

Haywood, K., and N. Getchell. 2009. *Life Span Motor Development*. Champaign, IL: Human Kinetics.

Hopsicker, P. 2009. "Polanyi's "From-To" Knowing and His Contribution to the Phenomenology of Skilled Motor Behavior." *Journal of the Philosophy of Sport* 36: 76–87.
Howard, J., and K. McInnes. 2010. "Thinking Through the Challenge of a Play-Based Curriculum, Increasing Playfulness via Co-construction." In *Thinking About Play*, edited by J. R. Moyles, 30–44. Berkshire: Open University Press.
Jurbula, P. 2015. "What Is Physical Literacy, Really?" *Quest (grand Rapids, Mich)* 67 (4): 367–383.
Kirk, D. 2010. *Physical Education Futures*. London: Routledge.
Laevers, F. 1994. *The Leuven Involvement Scale for Young Children*. Oxford: Gecko publishing.
Laevers, F. 2000. "Forward to Basics! Deep-Level-Learning and the Experiential Approach." *Early Years,* 20 (2): 20–29.
Laevers, F., and B. Declercq. 2011. *Raising levels of well-being and involvement in Milton Keynes Preschool Settings*.
Laevers, F., J. Moons, M. Daems, G. Debruyckere, B. Declercq, K. Silkens, and G. Snoeck. 2005. *Sics [Ziko] Well-being and involvement in care – a process-oriented self-evaluation instrument for care settings*.
Logan, S., L. Robinson, E. K. Webster, and L. Barber. 2013. "Exploring Pre-Schoolers" Engagement and Perceived Physical Competence in an Autonomy-Based Object Control Skill Intervention: A Preliminary Study." *European Physical Education Review,* 19: 302–314.
Macdonald, D. 2003. "Curriculum Change and the Post-Modern World: Is the School Curriculum-Reform Movement an Anachronism?" *Journal of Curriculum Studies* 35 (2): 139–149.
Maude, P. 2010. "Physical Literacy and the Young Child." In *Physical Literacy Throughout the Lifecourse*, edited by M. E. Whitehead, 100–115. London: Routledge.
Maynard, T. 2007. "Outdoor Play and Learning." *Education 3-13: International Journal of Primary, Elementary and Early Years Education,* 35 (4): 305–307.
Maynard, T., and J. Waters. 2007. "Learning in the Outdoor Environment: a Missed Opportunity?" *Early Years* 27 (3): 255–265.
McInnes, K., J. Howard, J. Miles, G. and K, and K. Crowley. 2009. "Behavioural Differences Exhibited by Children When Practising a Task Under Formal and Playful Conditions." *Educational and Child Psychology,* 26 (2): 31–39.
Merleau-Ponty, M. 1962. *Phenomenology of Perception: An Introduction*. London: Routledge.
Moyles, J. 2010. *The Excellence of Play*. New York: McGraw-Hill International.
Mygind, E. 2007. "A Comparison Between Children's Physical Activity Levels at School and Learning in an Outdoor Environment." *Journal of Adventure Education and Outdoor Learning,* 7 (2): 161–176.
Onwuegbuzie, A. J., and R. B. Johnson. 2006. "The Validity Issue in Mixed Research." In *The Mixed Methods Reader*, edited by V. Plano Clark, and J. Creswell, 271–298. Thousand Oaks, CA: Sage Publications.
Onwuegbuzie, A. J., and N. L. Leech. 2005. "Taking the 'Q' Out of Research: Teaching Research Methodology Courses Without the Divide Between Quantitative and Qualitative Paradigms." *Quality and Quantity* 39 (3): 267–295.
Reeve, J., H. Jang, D. Carrell, J. Barch, and S. Jeon. 2004. "Enhancing Students" Engagement by Increasing Teachers" Autonomy Support." *Motivation and Emotion* 28: 147–169.
Robinson, L. E. 2011. "Effect of a Mastery Climate Motor Program on Object Control Skills and Perceived Physical Competence in Pre-Schoolers." *Research Quarterly for Exercise and Sport,* 82 (2): 355–359.
Robinson, L. E., M. E. Rudisill, and J. D. Goodway. 2009. "Instructional Climates in Preschool Children Who Are At-Risk. Part II: Perceived Physical Competence." *Research Quarterly for Exercise and Sport* 80 (3): 543–551.
Ryan, R. M., and E. L. Deci. 2000. "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being." *American Psychologist,* 55 (1): 68–78.
Siraj, I. 2015. "Key findings from the independent stocktake of the Foundation Phase and evidence from research." Children in Wales conference, January 20.
Spradley, J. P. 1980. *Participant Observation*. Belmont: Wadsworth.
Stodden, D., J. Goodway, S. Langendorfer, M. Roberton, M. Rudisill, C. Garcia, and L. Garcia. 2008. "A Developmental Perspective on the Role of Motor Skill Competence in Physical Activity: An Emergent Relationship." *Quest (grand Rapids, Mich)* 60 (2): 290–306.
Stolz, S. A. 2013. "Phenomenology and Physical Education." *Educational Philosophy and Theory,* 45 (9): 949–962.
Talbot, M. 2007. "An Independent Voice for Physical Education: a Precious Asset." *Physical Education Matters,* 2 (4): 6–8.
Ulrich, D. A. 2000. *The Test of Gross Motor Development*. 2nd ed.Austin, TX: Pro-ed.
Valentini, N. C., and M. E. Rudisill. 2004. "Motivational Climate, Motor-Skill Development, and Perceived Competence: Two Studies of Developmentally Delayed Kindergarten Children." *Journal of Teaching in Physical Education,* 23 (3): 216–234.
Wainwright, N., J. Goodway, M. Whitehead, A. Williams, and D. Kirk. 2016. "The Foundation Phase in Wales – A Play-Based Curriculum That Supports the Development of Physical Literacy." *Education 3-13* 44 (5): 513–524.
Waite, S. 2010. "Losing Our Way? The Downward Path for Outdoor Learning for Children Aged 2–11 Years." *Journal of Adventure Education and Outdoor Learning* 10 (2): 111–126.
Walker, R. 2012. "Naturalistic Research." In *Research Methods and Methodologies in Education*, edited by J. Arthur, M. Waring, R. Coe, and L. Hedges. London: Sage.

Whitehead, M. E. 1990. "Meaningful Existence, Embodiment and Physical Education." *Journal of Philosophy of Education,* 24 (1): 3–14.
Whitehead, M. E. 2010. *Physical Literacy: Throughout the Lifecourse*. London: Routledge.
Whitehead, M. E. 2013. "Definition of Physical Literacy and Clarification of Related Issues." *ICSSPE Bulletin – Journal of Sport Science and Physical Education* 65: 28–33.
Whitehead, M. E. 2016. "The definition of physical literacy." Accessed 23 June 2017. http://www.physical-literacy.org.uk/.
Wood, E., and J. Attfield. 2005. *Play, Learning and the Early Childhood Curriculum*. London: Sage.