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### Article

**Citation** (please note it is advisable to refer to the publisher's version if you intend to cite from this work)

**Foweather, L, Van Rossum, T, Richardson, DJ, Hayes, S and Morley, D (2018) Primary teachers' recommendations for the development of a teacher-oriented movement assessment tool for 4-7 year children. Measurement in Physical Education and Exercise Science. 23 (2). pp. 124-**

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1 **Primary teachers' recommendations for the development of a teacher-**  
2 **oriented movement assessment tool for 4-7 year children**

3 **Abstract**

4 To inform the development of a teacher-oriented movement assessment tool, this  
5 study aimed to explore primary school teachers' perceptions of assessing  
6 fundamental movement skills (FMS) within physical education (PE) lessons.  
7 Thirty-nine primary school teachers of PE, located in the United Kingdom,  
8 participated in an individual or group semi-structured interview. Findings signify  
9 that teachers perceive a need for an appropriate and effective movement  
10 assessment tool that is simple to use, quick to administer, and that provides  
11 valuable feedback to guide future teaching and learning. This is vital as teachers  
12 indicated that a lack of appropriate resources and a shortage of curriculum time  
13 restricts their use of assessment within PE. A movement assessment tool that  
14 aligned to the curriculum would be beneficial to teachers to better support  
15 children's learning and acquisition of FMS, as well as to enhance the teachers'  
16 own understanding of the process of assessing FMS.

17 **Keywords:** Fundamental movement skills, assessment, primary teachers, Physical  
18 Education

19

## 1 **Introduction**

2 Fundamental movement skills (FMS) are grouped into three sub-categories of skills:  
3 stability (e.g. one leg balance, walking along a line), object control (e.g. overhand  
4 throwing, kicking a ball) and locomotor (e.g. running, hopping, skipping) (Gallahue,  
5 Ozmun & Goodway, 2012). FMS are the foundation of more complex skills and  
6 movement patterns that are developed to use within organised and non-organised games  
7 and sports (Barnett, Stodden et al. 2016; Hands, 2012), and are considered to play an  
8 important role in the physical and social development of children through adolescence  
9 and into adulthood (Clark & Metcalfe, 2002). It is preconceived that children have the  
10 potential to be competent in performing FMS by the age of seven years old (Gallahue,  
11 et al., 2012; Payne & Isaacs, 2011), with children who are competent at performing  
12 FMS being considered to exhibit movement competence (Morgan et al., 2013). Seefeldt  
13 (1980) hypothesised that children who do not achieve a sufficient level of movement  
14 competence, failing to pass through the ‘proficiency barrier’, will be inhibited when  
15 engaging in sports and games. In recent years, a number of systematic reviews (Barnett,  
16 Lai et al., 2016; Catuzzo et al., 2016; Lubans, Morgan, Cliff, Barnett & Okely, 2010)  
17 have revealed a positive association between FMS competence and physical activity  
18 levels during childhood and adolescence. Of note, Foweather et al. (2015) reported that  
19 in early childhood (participants aged 3-5 years), FMS competence was positively  
20 associated with physical activity levels across the week. Similarly, in later childhood  
21 (participants aged 6-10 years), De Meester et al. (2018) found that children with high  
22 levels of FMS competence spent a greater amount of time each day being physically  
23 active. Thus, demonstrating that the ‘proficiency barrier’, described by Seefeldt (1980),  
24 may well exist and that an emphasis should be placed on developing FMS competence

1 from early childhood, to equip children with the skills to be physically active during  
2 childhood and into adolescence.

3         The need to address development of FMS competence within PE during early  
4 childhood is reflected in curriculum guidelines globally (Australian Curriculum  
5 Assessment and Reporting Authority, 2015; Department for Education, 2013; Ontario  
6 Ministry of Education, 2015; Society of Health and Physical Educators America, 2016).  
7 For instance, the most recent PE curriculum for the United Kingdom emphasises ‘pupils  
8 should develop fundamental movement skills.... mastering basic movements including  
9 running, jumping, throwing and catching, as well as developing balance, agility and co-  
10 ordination’ (Department for Education, 2013). It has also been recommended that  
11 primary school teachers become more involved in assessing children’s FMS to  
12 subsequently support their development (Morley, Till, Ogilvie & Turner, 2015).  
13 Furthermore, assessing FMS in early childhood would highlight those children with low  
14 levels of movement competence and allow for appropriate curriculum guidance or  
15 interventions to be introduced to improve movement competence (Lopes, Rodrigues,  
16 Maia & Malina, 2011).

17         Assessment within education is categorised in two forms: summative assessment  
18 and formative assessment (Hay, 2006). Summative assessment is a broader term for the  
19 Assessment of Learning (AoL) and takes a more formal judgement to assess what has  
20 been learned through the application of a written and/or verbal assessment method  
21 (Hay, 2006). Formative assessment is generalised as Assessment for Learning (AfL)  
22 and is the measuring process used by the teacher to feedback and modify future  
23 teaching to address the needs of the learner (Black & Wiliam, 2010; Hay, 2006).  
24 According to Hay and Penney (2009) assessment within PE should be viewed as a  
25 process through which learning can be promoted, with AfL being the principal form of

1 assessment. Further, they state that an integral element of the assessment is that it aligns  
2 with the curriculum and pedagogy. It has long been understood that teacher-led  
3 assessment is a key element in the Teaching-Assessment-Learning cycle (Carroll, 1994;  
4 Roberton & Halverson, 1984) by providing a teacher valuable feedback to improve  
5 standards of learning (Black & Wiliam, 2010). Therefore, assessing children's FMS  
6 competence could help teachers to support and enhance the development of their pupils  
7 (Herrmann, Gerlach & Seelig, 2015; Stodden, Langendorfer & Roberton, 2009; Tidén,  
8 Lundqvist & Nyberg, 2015).

9 FMS are typically developed during early childhood (Gallahue et al., 2012),  
10 with primary school potentially providing the optimal environment for this to take place  
11 (Morgan et al., 2013). However, typically, teachers of primary school physical  
12 education (PE) in the United Kingdom are generalist teachers, who receive minimal  
13 training during Initial Teacher Training (ITT) to teach PE (Harris, Cale and Musson,  
14 2012). This results in teachers who lack expertise and confidence in assessing children  
15 within a PE setting (Harris et al., 2012; James, Griffin & France, 2005; Morgan &  
16 Bourke, 2008; Morgan & Hansen, 2007; Ní Chróinín & Cosgrave, 2013), with teachers'  
17 reporting this as one of the hardest aspects of their job (Morgan & Hansen, 2007). Some  
18 primary schools in the United Kingdom now employ external sport coaches and  
19 specialist PE teachers, who, unlike generalist teachers, have completed a minimum one-  
20 year training course for teaching PE. However, a study examining secondary school PE  
21 teachers' perceptions of teaching FMS reported that even subject specialist teachers are  
22 low in confidence and knowledge in assessing FMS (Lander, Barnett, Brown &  
23 Teldord, 2015).

24 The limitations of existing FMS assessments for use by teachers in school  
25 settings are well reported (Cools, de Martelaer, Samaey & Andries, 2008; Giblin,

1 Collins & Button, 2014). Traditional methods for assessing children's FMS were  
2 typically designed for physical therapists and researchers to measure movement  
3 deficiencies (Cools, et al., 2008), deeming them unsuitable for use by teachers of PE in  
4 a school setting (Giblin et al., 2014). Further, the composition of existing assessments of  
5 FMS competence, such as the Bruininks-Oseretsky Test of Motor Proficiency, Second  
6 Edition (BOTMP-2) (Bruininks & Bruininks, 2005) that assesses fine and gross motor  
7 control, leads to limited curricular validity for the PE syllabus of children aged 4-7  
8 years old as they do not contain a component to assess competence of stability skills.  
9 The inclusion of a wide range of skills across existing assessments could be due to the  
10 initial purpose of each assessment and the context, and by whom, they are to be  
11 administered. For example, the Körperkoordinationstest für Kinder (KTK) (Schilling  
12 and Kiphard, 1974) was intended to assess gross motor co-ordination, thus does not  
13 contain any object control component. As Tompsett, Sanders, Taylor, and Cobley  
14 (2017) suggest, further investigation is required to define the format and content of an  
15 optimal FMS assessment for primary school teachers to use.

16 In recent years, a selection of movement assessment tools have been developed  
17 with teachers and practitioners in mind as the assessor (Canadian Assessment  
18 Movement Skill and Agility [CAMSA]: Longmuir et al., 2015; Motorische  
19 Basiskompetenzen [MOBAK]: Herrman et al., 2015). The CAMSA (Longmuir et al.,  
20 2015) is intended for children aged 6-14 years old and requires children to complete a  
21 movement based course including seven skills that reflect 'real world' abilities  
22 (Longmuir et al., 2015). The CAMSA is feasible, reliable and valid for use by  
23 Secondary school teachers of Year 7 girls PE (Lander, Morgan, Salmon, Logan and  
24 Barnett, 2016; Lander, Morgan, Salmon, Logan and Barnett, 2017). However, the  
25 feasibility and reliability of the protocol when administered by non-specialist teachers

1 of PE in primary schools has not yet been examined. Furthermore, the CAMSA's  
2 method of assessment, allowing only one child to be active at a time during the  
3 assessment process, poses a potential challenge for a primary teacher to conduct the  
4 assessment whilst managing a class of children. The MOBAK (Herrmann et al., 2015),  
5 an FMS assessment designed for teachers, aligns itself to the specifics of the primary PE  
6 curriculum, and reports to be a valid and appropriate movement assessment tools  
7 suitable for teachers (Herrmann et al., 2015). Despite these claims, it is not clear  
8 whether the design and validation of the assessment involved consultation with  
9 teachers, thus there is little understanding to the appropriateness of the selected  
10 assessment method for primary school teachers who have limited PE training and  
11 subject understanding. In order to provide teachers with a feasible FMS assessment tool,  
12 it was felt to be important to understand the challenges and issues faced by teachers to  
13 assess FMS in a school setting and to discover what their preferred method of  
14 assessment would involve.

15 Therefore, the purpose of this study was to examine the perceptions of primary  
16 school teachers in order to i) understand their existing practice of assessing FMS and ii)  
17 establish key recommendations for the development of a teacher-oriented FMS  
18 assessment protocol, aligned to the PE curriculum suitable for children aged 4-7 years  
19 old. This study formed part of a wider research programme to develop a movement  
20 assessment tool for primary school teachers in the United Kingdom.

21

## 22 **Methodology**

### 23 *Design*

24 Within this study, individual and group semi-structured interviews were conducted to  
25 explore primary school teachers' perceptions of assessing FMS within PE. Primary

1 schools predominantly in two large cities in the North of England were contacted to  
2 take part in this study, conducted between May and November 2015. Prior to  
3 commencing research activity, approval was granted by the ethics committee of  
4 (*institution and reference to be added following the review process*).

5

## 6 ***Recruitment and participants***

7 A stratified purposeful sampling strategy (Patton, 2002) was used to recruit participants.  
8 Schools were identified from Local Authority contact lists of the two participating  
9 cities, and from information provided by the research partner (the Youth Sport Trust).  
10 Invitation packs, containing a letter and participant information sheet, were sent via  
11 email to the headteacher of each school (n=104), with the request to share with their  
12 teaching staff. Teachers were asked to respond directly to the lead researcher via email  
13 or telephone. The lead researcher made follow up telephone calls to each school if a  
14 response was not received from the initial invitation. Upon accepting the invitation,  
15 potential participants were asked to sign a consent form and provide demographic  
16 information (length of teaching experience, role in school and gender). Using this pre-  
17 determined stratification criteria, thirty-nine teachers of PE from twenty primary  
18 schools across two cities in the United Kingdom were interviewed. The participant  
19 sample comprised: gender (female, n=27, male, n=12), length of teaching experience  
20 (Mean 8.1 years, SD = 6.4 years), teaching role (PE specialist, n=8; PE co-ordinator,  
21 n=12; generalist teacher, n=19), school location (urban, n=32; and rural, n=7) and  
22 school status (state, n=34; and independent, n=5).

23

24 Due to early difficulties with recruitment (cited reasons from teachers included lack of  
25 time available, problems caused by examination periods, and absence through illness),



1 the study was divided into two phases separated by the schools' summer holiday period  
2 in 2015. Phase One interviews were conducted in June and July and involved 17  
3 primary school teachers located in the North East (n=12) and North West (n=5) of  
4 England. Phase Two interviews were conducted between September and November  
5 2015 and involved 22 primary school teachers located in the North East (n=12), North  
6 West (n=9) and South West (n=1) of England.

7

### 8 *Semi-structured interviews*

9         Semi-structured interviews were used to explore the thoughts and experiences of  
10 the interviewee (Berg, 2009; Kvale & Brinkmann, 2009). The interviews were  
11 structured to examine two key research questions: 1) What are primary school teachers'  
12 perceptions of assessment within PE? 2) What do primary school teachers consider the  
13 most suitable method of assessing children's movement within PE?

14         Using the style described by Berg (2009), the interview schedule was  
15 constructed around the key conceptual areas of interest that had been identified to  
16 investigate the research questions (see Table 1). The stages of the interview schedule  
17 centred on 'essential' questions, with 'informal' questions included at the beginning to  
18 build rapport and focus attention on the subject of the interview (Berg, 2009). Probes  
19 and prompts, such as 'can you explain in more detail why you think this?', were used to  
20 elicit more information if a respondent's initial answer was unclear or incomplete  
21 (Gillham, 2005). To assess the effectiveness of the interview schedule, Gillham (2005)  
22 recommends conducting pilot interviews with a real sample of participants. Three pilot  
23 interviews were conducted with primary school teachers. Analysis of the data from the  
24 pilot interviews, and feedback from the pilot participants, resulted in the reduction of  
25 the number of scripted questions from sixteen to twelve and amendments to the wording

1 of some questions to language more understandable for teachers. These revisions  
2 focused the interview schedule on the areas of most importance, specifically Stage 5,  
3 and provided additional time for extra non-scripted probing questions to be used to seek  
4 additional, unexpected information (Kvale & Brinkmann, 2009).

5

6 *[Insert table 1 here]*

7

8 Participants were offered the choice of individual interviews or group interviews  
9 using the identical interview schedule. Group interviews were conducted with members  
10 of staff from the same school, and allowed multiple participants to be involved at  
11 convenient times during their school day (for example, lunch times and after school). To  
12 encourage participation within the group setting, participants were informed that they  
13 were free to contribute at any point (Fontana & Frey, 2008) and the lead researcher  
14 moderated the discussion to mitigate a dominant voice taking over (Berg, 2009).  
15 Fourteen individual interviews (Mean duration = 35mins, range = 34mins and nine  
16 small group interviews (Mean duration = 36mins, range = 39mins) were conducted.  
17 Small group interviews comprised two (n=5), three (n=3) and six participants (n=1).  
18 Individual and group interviews were conducted face-to-face at the participant's school  
19 (n=33), via Skype with video (n=4) and telephone (n=2). Offering Skype and telephone  
20 interviews reduced personal inconvenience, for example, in one instance, a participant,  
21 preferred to be interviewed from her home as she worked part time. As previously  
22 discussed by Iacono, Symonds and Brown (2016), interviews conducted via Skype with  
23 video were deemed as effective as having face-to-face interaction.

24 Following Phase One data collection, an initial analysis was conducted and key  
25 recommendations from teachers for an assessment protocol were formed. Following this

1 analysis, a storyboard (See Figure 1 for a sample of the storyboard, see Appendix A for  
2 the full storyboard) was digitally created to provide a visual representation of the  
3 process and content of the movement assessment tool as recommended by teachers in  
4 Phase One. Subsequently the storyboard was shown on a laptop computer to teachers  
5 during interviews in Phase Two to provide focus and stimulate the discussion (Cross &  
6 Warwick-Booth, 2016). The storyboard was first introduced to participants during Stage  
7 5 of the interviews, which focused on the format of the movement assessment tool. The  
8 preceding stages of the interview schedule remained unchanged from Phase One to  
9 retain consistency between the two phases and to allow comparisons across the  
10 interviews (Berg, 2009). Separating the interviews into two phases and creating the  
11 storyboard allowed the data collection in Phase Two to focus participants' attention  
12 (Hoepfl, 1997), which encouraged further recommendations for the appropriate design  
13 of the movement assessment tool.

14

15 *[Insert figure 1 here]*

16

### 17 ***Data analysis***

18 All interviews were digitally recorded (Sony IC recorder ICD –PX140), transcribed  
19 verbatim and subsequently managed within NVivo analysis software. The transcripts  
20 were initially read by the lead author and deductively analysed (Patton, 2002) using a  
21 qualitative thematic approach (Braun & Clarke, 2006) founded on the framework of the  
22 interview schedule. Following this early analysis, the lead author re-read the transcripts,  
23 allowing new themes and sub-themes to develop inductively from the data (Patton,  
24 2002). This deductive and inductive approach provided a thorough exploration and  
25 analysis of the research questions by comparing existing beliefs around teachers'

1 perceptions of assessment within PE with the new concepts that developed directly from  
2 the data (Boeije, 2010). Verbatim quotes have been included to provide contextual  
3 understanding and interpretation of the participants experiences and perceptions (Patton,  
4 2002). Single comments, illustrating the participants' individual connection to the  
5 research questions (Braun & Clarke, 2006), were considered as important as those that  
6 were repeated or agreed by others.

7

## 8 **Findings and discussion**

9 The purpose of this study was to explore primary teachers' perceptions of assessing  
10 children's FMS to inform the development of a teacher-oriented FMS assessment. To  
11 better understand the context of primary teacher-led assessment of FMS, it was also  
12 important to examine how participants perceive assessment within PE and discover how  
13 they include assessment within their own teaching. Therefore, the findings are presented  
14 under the headings of the two key areas of investigation: i) Primary school teachers'  
15 perceptions of assessment within PE; and ii) Primary school teachers' recommendations  
16 for an appropriate movement assessment tool to use in primary schools, which  
17 consequently formed the key themes of the analytical framework. Within each of the  
18 key themes, participants' experiences and perceptions are discussed within the emergent  
19 sub-themes (See Table 2).

20

21 *[Insert Table 2 here]*

22

### 23 ***Primary school teachers' perceptions of assessment within PE***

24 This section highlights the participants' perceptions of assessment within PE and  
25 discusses their current assessment practice within the subject. Participants' perceptions

1 were defined in the following areas; i) the role of assessment, and ii) access to  
2 assessments.

3

#### 4 *The role of assessment in PE*

5 Teachers recognised the value of assessment to support children's development in PE,  
6 yet they were also aware that not all assessment has the same influence, *'I really do  
7 want to feel that it's making a difference. I wouldn't want it to become something, sort  
8 of just paperwork, and think 'Well actually, how much is that going to help?''* (PE  
9 specialist, male, 13 years' experience). Participants also recognised the value of  
10 assessment for recording children's progress. One participant explained *'we have a tick  
11 list with perhaps three different criteria on it, and we just look to see where they are  
12 over a few lessons, so to see if they move or if they stay the same'* (Year 2 teacher,  
13 female, 3 years experience). Additionally, it was also recognised that assessment within  
14 PE will become more important to justify budgetary spending in the subject, as one  
15 participant suggested:

16 we need to get a focus on assessment in PE, again with Sports Premium  
17 funding, they want to know how the children are making progress and I  
18 think very soon we are going to be answerable for progress'. (PE co-  
19 ordinator, female, 30 years' experience).

20 Due to the absence of formalised or statutory assessment within PE (Department  
21 for Education, 2013), participants reported that, currently, the main purpose of  
22 assessment was to report to parents at the end of the year. Objective based mark sheets  
23 were used by teachers to assess competence in PE, with a number of participants using  
24 AfL strategies to evaluate and monitor children's development:

1 We're really into AfL..., and making those judgements as we're going.  
2 We want to respond to what we see - not think about it afterwards, and  
3 that's really important to us. (PE specialist, male 7 years teaching  
4 experience).

5 Crucial to observing these things is whether the children are able to do  
6 these things, that always tells me as a practitioner that developmentally  
7 something isn't right, which sometimes can mean there are actually  
8 implications. (EYFS teacher, female, 6 years experience).

9 The value placed by participants towards AfL indicates that a process-oriented  
10 scoring approach, measuring the quality of the child's movement, would be preferred  
11 for a teacher-oriented movement assessment tool. A number of previous studies have  
12 recommended this approach for enhancing children's learning (Black & Wiliam, 2008;  
13 Hay & Penney, 2009; MacPhail & Halbert, 2010; Tidén et al., 2015). Specifically,  
14 MacPhail and Halbert (2010) reported that secondary school teachers of PE improved  
15 the standard teaching, learning and assessment in their PE lessons after implementing  
16 AfL within their lessons. However, to be used effectively, this requires the assessor to  
17 have prior knowledge of what they are assessing (Tidén et al., 2015). Therefore,  
18 cautious steps must be taken when assessments focused on AfL are to be used by  
19 teachers who do not have in-depth knowledge of what they are assessing (Tidén et al.,  
20 2015).

21

#### 22 *Access to assessments*

23 Participants indicated that they use a range of sources to access information to support  
24 their PE curricular knowledge, including training and resources offered by their Local

1 Authority, bought in resources (e.g. Real PE, Create Development) and online resources  
2 (e.g. Youtube). However, participants reported a shortage of assessment tools that they  
3 can access to assess FMS:

4 We've got the PE coach doing a skills assessment at the end of each  
5 topic that he does, but in regard to tracking that across the school from  
6 Key Stage 2 anyway, or even maybe Key Stage 1, with the exception of  
7 Foundation Stage, possibly, I'd say there's something lacking. (Year 4  
8 teacher, male, 3 years' experience).

9 There is a gap in the market for this because it is, with assessment in  
10 general it's got to be simple. It's got to be effective and it's got to be a  
11 tool where you go back to it. And you say "yeah great I know that I need  
12 to now use that to help me plan". (Year 6 teacher, female, 10 years'  
13 experience).

14 These results are in agreement with the suggestion made by Giblin et al. (2014)  
15 that there are a shortage of FMS assessment tools available to primary school teachers.  
16 Considering that primary school should provide an optimal environment for children to  
17 develop FMS (Morgan et al., 2013), it is imperative that FMS assessment resources are  
18 designed for the specific needs of generalist teachers, who have lack confidence and  
19 understanding in assessing PE (Harris et al., 2012; James et al., 2005; Ní Chróinín &  
20 Cosgrave, 2013). Furthermore, the removal from the curriculum of national level  
21 descriptors (Department for Education, 2014), which were a guideline for assessing  
22 children's progress, leaves schools and teachers in a position requiring them to create  
23 their own assessment framework for children. These findings indicate that providing

1 teachers with more guidance and support in assessing PE may encourage more  
2 meaningful assessment to take place within the subject.

3

#### 4 ***Recommendations for an FMS assessment tool***

5 The previous findings revealed participants' experiences of assessing within PE,  
6 highlighting the need, and desire from primary teachers, for an appropriate method of  
7 assessing children's FMS. The following section discusses the key recommendations  
8 made for an appropriate method of assessing children's FMS in lesson time. This topic  
9 is discussed within the four emergent sub-themes that illustrated participants'  
10 perspectives for the movement assessment tool; i) available teaching time, ii)  
11 assessment functionality, iii) nature of the assessment, and iv) recording evidence of the  
12 assessment.

13

#### 14 *Available teaching time*

15 A key issue raised by participants was that they feel pressured within school by the  
16 shortage of available curricular time for PE, '*time is of a massive issue as our lessons*  
17 *are only 40 minutes long for a single lesson*' (PE specialist, male, 16 years' experience).  
18 Typically, other subjects, such as English and Maths, are given higher importance and  
19 take priority, '*we track English and maths really well, and we track writing and*  
20 *reading, but then the other things almost fall at the wayside sometimes.*' (Year 4  
21 teacher, female, 3 years' experience). These comments could be a result of assessment  
22 within core subjects, unlike PE, being a statutory requirement (Department for  
23 Education, 2013). To make assessment more attractive to primary school teachers to  
24 include within their current teaching of PE, participants stipulated that the movement  
25 assessment tool needs to follow a simple process and be quick to administer, with a



1 Year 1 teacher suggesting ‘*it just has to be easy. It has to not be time consuming and it*  
2 *has to tell staff what they are looking for. What they should be doing, what the children*  
3 *should be doing.*’ (female, 30 years’ experience).

4

#### 5 *Assessment functionality*

6 Existing FMS assessment tools are restrictive for use by primary school teachers (Giblin  
7 et al., 2014) and the interviews provided insight into participants’ perceptions to support  
8 the design of a movement assessment tool that suits their needs. It was suggested by  
9 participants that they want the movement assessment tool to provide valuable feedback  
10 that will facilitate a positive influence within their future lesson planning:

11 I suppose having an assessment tool that takes that into account – that  
12 you’re not just looking for the children you know. You’re breaking the  
13 assessment down. For example, if they can’t run straight or backwards,  
14 whatever it is, you have that process in place so the teacher can say  
15 ‘Right, this child can’t do this. I know to get them to here they need to do  
16 this, this and this’. (Year 4 teacher, male, 3 years’ experience).

17 Participants indicated that a lot of the resources and assessments they currently  
18 use are paper-based. Yet, perspectives of this practice were negative, with one  
19 participant reflecting ‘*we need to get rid of paperwork, and I know that’s what we’re*  
20 *doing at the moment but we don’t have any technological resources to help us*’ (Year 1  
21 teacher, female, 1 year experience). Using digital technology, such as an iPad, was  
22 recommended by another participant, who expressed ‘*it would be so much easier on a*  
23 *tablet for me, because it would be quicker to just sit there and just go through it*’ (PE  
24 *co-ordinator, male, NQT*). Graham, Holt/Hale and Parker (2013) have previously

1 suggested that the popularity of tablet devices could revolutionise assessment practices  
2 by reducing paperwork and increasing efficiency.

3           It was suggested by participants that including video demonstrations of the skills  
4 to assess would be a valuable support to them. Notably, having the facility to show  
5 video clips demonstrating the skill to the children was deemed important, *'you could*  
6 *project that onto a wall or whatever and show the children, so you've got that demo and*  
7 *you can press play, this is your demonstration and everything, this is your performance*  
8 *mirrored next to it'* (PE specialist, male, 16 years' experience). Embedding audio-  
9 visual clips within a digital resource would also provide support and guidance to  
10 teachers, *'having that there with a clip of what's expected, and then saying "this is what*  
11 *you need, these are your teaching points"'* (Year 4 teacher, male, 3 years' experience).  
12 Some participants suggested that being low in confidence in the subject deterred them  
13 from providing demonstrations to their class or that their demonstrations were not  
14 adequate. Therefore, including video content in the assessment resource would both  
15 support teachers understanding in effectively administering the assessment, as well as  
16 offer an alternative demonstration method so that children can be shown the movement  
17 skill performed correctly, thus potentially enhancing their learning opportunities (Chan,  
18 Ha & Ng, 2016).

19

### 20 *Nature of the assessment*

21 Despite previous calls for teachers to be more involved in assessing FMS (Cools, et al.  
22 2008; Morley et al., 2015), there is a shortage of research discussing how primary  
23 school teachers should assess children's FMS. The findings here describe teachers'  
24 recommendations for the outcomes of the assessment and the process that these would  
25 follow. Participants implied that the value of the movement assessment tool would be

1 improved if it positively impacted on their future teaching and the learning experience  
2 of their pupils. To achieve this, teachers indicated that they want to be able to record  
3 more than just the outcome of the assessment and that just saying ‘yes’ or ‘no’ for a  
4 child’s outcome is not enough.

5 I like it being able to just click on the name and say which criteria  
6 they’ve fulfilled so you’ve got a log next to each child saying what  
7 they’ve done and showing what level they are working at whether its  
8 above, at or below. (EYFS, female, 12 years’ experience).

9 Some sort of generic criteria that says their achievement is at this level,  
10 or they’re achieving but their achievement is at a basic level. (PE  
11 specialist, male, 18 years’ experience).

12 Furthermore, it is important that the objectives and expected outcomes in the  
13 assessment are related to the curriculum and clearly defined. One participant stated  
14 *‘sometimes the objectives are quite broad. For instance, ‘jumps off objects and lands*  
15 *appropriately.’ Well what does ‘lands inappropriately look like?’ What do they need to*  
16 *do not to do it?’* (EYFS teacher, female, 6 years’ experience).

17

#### 18 *Recording evidence of the assessment*

19 A significant feature of the movement assessment tool recommended by participants is  
20 that it needs to provide evidence of what the child has achieved and that it establishes a  
21 record of their progress. Again, it was suggested that an app-based assessment, utilising  
22 a simple recording process would be attractive to teachers.

1 Things I like are where it's there and it's almost quite clear and you go  
2 tick, so you almost have it recorded, you're not having to go away and  
3 process it or think about it. It can be within the lesson, it's not too  
4 onerous. (PE co-ordinator/Year 5 teacher, female, 9 years' experience)

5 Teachers believed that if the movement assessment tool displayed the  
6 assessment content and scores, this would reduce time-consuming paperwork. This is  
7 important to teachers as:

8 [we] haven't got a way of recording that because you have to remember  
9 it and then write it down later on. If it was a case of you walking around  
10 with your iPad in your hand and you're thinking "let me show you how  
11 to do that" or "you're really good at that". (Year 5 teacher/PE co-  
12 ordinator, female, 9 years' experience).

13 In addition to using the visual recording as evidence, participants highlighted  
14 that being able to record and replay the videoed performance back to the child would be  
15 advantageous in supporting the child's development.

16 The more different ways you can show how you want them to do it or if  
17 they haven't got it, to show them the right way to do it, then the more  
18 chance they have of picking it up because some will be happy watching  
19 me and some will be happy watching a video. (PE specialist, male, 11  
20 years' experience)

21  
22 He [the child] knew straight away and he was able to fix it straight away.  
23 Whereas I'd said to him a couple of times before, I got the iPad and as

1 soon as he saw it [his movement] on the iPad he sorted it. (Year 5  
2 teacher/PE Co-ordinator, female, 9 years' experience)

3 Hay and Penney (2009) suggested that in the domain of movement performance,  
4 feedback to students, supported by evidence, is vital to enhance learning. They further  
5 proposed that this evidence would best be provided in the form of a video recording of  
6 their performance, as well as written or verbal feedback. There is already  
7 acknowledgement that video recording is a useful tool to enhance learning (Graham,  
8 Holt/Hale & Parker, 2013), and using digital video for feedback and self-assessment in  
9 PE has been shown to enhance children's motivation and improve their skill  
10 performance (O'Loughlin, Chróinin & O'Grady, 2013). Furthermore, assessing  
11 movement skills from video can be simpler for an untrained assessor (Gard & Rösblad,  
12 2009) and the hand-held nature of the tablet enables the teacher to be mobile during the  
13 assessment and record the performance from different angles. Research on the use of  
14 digital app based technology within schools is limited. However, in a recent study,  
15 Browne (2015) indicated the advantages that teachers reported with using tablet  
16 applications within their teaching of PE, including the value of using tablets to record  
17 and analyse children's performance. The findings within this theme and the themes  
18 discussed earlier, suggest that assessments utilising digital technology would be well  
19 received by primary school teachers. The additional functions provided by digital  
20 technology to record and capture evidence of children's FMS could encourage teachers  
21 to use the movement assessment tool more frequently. This method of assessment could  
22 also be adopted for wider curriculum areas within PE, where evaluating performance  
23 and recording children's progress is also required.

## 24 25 **Conclusion**

1 These findings indicate that primary teachers recognise the significant role that assessment  
2 has in enhancing children’s learning. However, due to the shortage of movement  
3 assessment tools for primary teachers to use, participants in this study relied upon their  
4 own, sometimes limited, knowledge and expertise to implement assessment of FMS. In  
5 general, there is demand from primary school teachers for a movement assessment tool, so  
6 that they can enhance the learning environment for children and better support their  
7 development of FMS. Teachers recommended that an appropriate and effective movement  
8 assessment tool should be simple to use, quick to administer and provide valuable feedback  
9 to guide their future teaching and better support children’s learning of FMS.

10 The suggestion from participants to embrace digital technology through the use of  
11 tablet devices, such as iPads, supports the recommendations made by Graham, Holt/Hale  
12 and Parker (2013) and O’Loughlin, Chróinin and O’Grady (2013), who highlighted the  
13 potential advantages of using digital technology to optimise assessment opportunities in  
14 PE. Importantly, participants reported that video content would assist teachers who require  
15 additional guidance to conduct the assessment. Furthermore, digital technology allows a  
16 simple method of scoring and recording data, and does not demand the same attention after  
17 the lesson that would be required to maintain paper-based records. A digital app, providing  
18 video content and video capture, may enhance the child’s learning experience through the  
19 additional support provided to teachers to develop children’s FMS.

20 Initially providing teachers with an instructive, mechanical way of assessing FMS  
21 may assist in developing their confidence and competence to assess, allowing them to  
22 modify their engagement and usage of the movement assessment tool over time. In this  
23 way, teachers would maintain their freedom to exhibit and develop their professional  
24 practice. This aligns with the notion of assessment in PE being authentic (Hay and Penney,  
25 2009), enabling teachers to customise and refine how they incorporate the movement

1 assessment tool within their teaching to suit their children and the environment that they  
2 work within.

3           This study has assisted in developing a method for primary school teachers to  
4 assess children's FMS (Youth Sport Trust, 2017). Primary teachers have provided a  
5 comprehensive description of the processes and mechanisms of the assessment. However,  
6 due to their perceived low level of understanding of FMS and the shortage of literature  
7 discussing teacher-oriented assessment of FMS, seeking the opinion of experts of  
8 children's movement to generate the content of movement assessment tool (e.g. the  
9 number and type of skills required to assess FMS) is recommended to ensure the  
10 assessment provides a valid measure of FMS competence. If suitably aligned to the  
11 curriculum, this movement assessment tool could then be used by primary school teachers  
12 to enhance the learning environment for children to acquire and develop FMS, providing  
13 children with the skills they need to be more physically active throughout childhood and  
14 into adolescence (Barnett, Lai et al., 2016; Catuzzo et al., 2016; De Meester et al., 2018;  
15 Foweather et al., 2015; Lubans et al., 2010; ). Subsequently, future research should look at  
16 the impact of the assessment on teacher-led assessment and the consequential evolution of  
17 teaching practice and patterns of change in children's FMS competence.

## 1   **References**

- 2   Australian Curriculum Assessment and Reporting Authority (2015). *Foundation – Year*  
3       *10 Health and Physical Education*. Available online at:  
4       [https://www.australiancurriculum.edu.au/f-10-curriculum/health-and-physical-](https://www.australiancurriculum.edu.au/f-10-curriculum/health-and-physical-education/)  
5       education/
- 6   Barnett, L. M., Stodden, D., Cohen, K. E., Smith, J. J., Lubans, D. R., Lenoir, M., ... &  
7       Lander, N. J. (2016). Fundamental movement skills: An important  
8       focus. *Journal of teaching in physical education, 35*(3), 219-225.
- 9   Barnett, L. M., Lai, S. K., Veldman, S. L., Hardy, L. L., Cliff, D. P., Morgan, P. J., ... &  
10       Rush, E. (2016). Correlates of gross motor competence in children and  
11       adolescents: a systematic review and meta-analysis. *Sports Medicine, 46*(11),  
12       1663-1688.
- 13   Berg, B. L. (2009). *Qualitative Research Methods for the Social Sciences. 7th Ed.*  
14       Boston, MA: Pearson International.
- 15   Black, P. & Wiliam, D. (2010). Inside the black box: Raising standards through  
16       classroom assessment. *Phi Delta Kappan, 92*(1), 81-90.
- 17   Boeije, H. R. (2010). *Analysis in Qualitative Research*. London: Sage.
- 18   Braun, V. & Clarke. V. (2006). Using thematic analysis in psychology. *Qualitative*  
19       *Research in Psychology, 3*, 77-101.
- 20   Browne, T. (2015). A case study of student teachers' learning and perceptions when  
21       using tablet applications teaching physical education. *Asia-Pacific Journal of*  
22       *Health, Sport and Physical Education, 6*(1), 3-22.



- 1 Bruininks, R. H., & Bruininks, B. D. (2005). *BOT2: Bruininks-oseretsky test of motor*  
2 *proficiency*, Second Edition. AGS Publishing.
- 3 Carroll, B. (1994). *Assessment in Physical Education: A Teachers Guide to the Issues*,  
4 London: Falmer Press.
- 5 Cattuzzo, M. T., dos Santos Henrique, R., Ré, A. H. N., de Oliveira, I. S., Melo, B. M.,  
6 de Sousa Moura, M., ... & Stodden, D. (2016). Motor competence and health  
7 related physical fitness in youth: A systematic review. *Journal of Science and*  
8 *Medicine in Sport*, 19(2), 123-129.
- 9 Chan, C., Ha, A., & Ng, J. Y. (2016). Improving fundamental movement skills in Hong  
10 Kong students through an assessment for learning intervention that emphasizes  
11 fun, mastery, and support: the A+ FMS randomized controlled trial study  
12 protocol. *SpringerPlus*, 5(1), 724.
- 13 Clark, J. E., & Metcalfe, J. S. (2002). The mountain of motor development: A  
14 metaphor. *Motor development: Research and reviews*, 2(163-190).
- 15 Cross, R., & Warwick-Booth, L. (2016). Using storyboards in participatory  
16 research. *Nurse researcher*, 23(3), 8-12.
- 17 Cools, W., De Martelaer, K., Samaey, C., & Andries, C. (2008). Movement skill  
18 assessment of typically developing preschool children: A review of seven  
19 movement skill assessment tools. *Journal of sports science & medicine*, 8(2),  
20 154.

- 1 De Meester, A., Stodden, D., Goodway, J., True, L., Brian, A., Ferkel, R., & Haerens,  
2 L. (2018). Identifying a motor proficiency barrier for meeting physical activity  
3 guidelines in children. *Journal of science and medicine in sport*, 21(1), 58-62.
- 4 Department for Education (2013). *National curriculum in England: PE programmes of*  
5 *study*.
- 6 Department for Education (2014). *Physical Education Expert Group: Guidance on*  
7 *Assessment: National Curriculum*.
- 8 Fontana, A. & Frey, J. (2008). *The Interview: From neutral stance to political*  
9 *involvement*. Chapter 4 in *Collecting and Interpreting Qualitative Materials, 3<sup>rd</sup>*  
10 *edition*, edited by Denzin, N. K. and Lincoln, Y. S. Thousand Oaks, California:  
11 Sage Publications.
- 12 Fowweather, L., Knowles, Z., Ridgers, N. D., O'Dwyer, M. V., Foulkes, J. D., & Stratton,  
13 G. (2015). Fundamental movement skills in relation to weekday and weekend  
14 physical activity in preschool children. *Journal of science and medicine in*  
15 *sport*, 18(6), 691-696.
- 16 Gallahue, D., Ozmun, J. C. & Goodway, J. D. (2012). *Understanding Motor*  
17 *Development: Infants, Children, Adolescents, Adults. 7th Ed.* New York:  
18 McGraw-Hill Companies, Inc.
- 19 Gard, L., & Rösblad, B. (2009). The qualitative motor observations in Movement ABC:  
20 Aspects of reliability and validity. *Advances in Physiotherapy*, 11(2), 51-57.
- 21 Giblin, S., Collins, D., & Button, C. (2014). Physical literacy: importance, assessment  
22 and future directions. *Sports Medicine*, 44(9), 1177-1184.

- 1 Gillham, B. (2005). *Research Interviewing: The range of techniques: A practical guide*.  
2 McGraw-Hill Education (UK).
- 3 Graham, G., Holt/Hale, S. A., & Parker, M. (2010). *Children moving: a reflective*  
4 *approach to teaching physical education, 9th Ed.* New York, McGraw Hill.
- 5 Hands, B. P. (2012). How fundamental are fundamental movement skills?. *Active and*  
6 *Healthy Magazine, 19(1)*.
- 7 Harris, J., Cale, L., & Musson, H. (2012). The predicament of primary physical  
8 education: a consequence of 'insufficient' ITT and 'ineffective' CPD? *Physical*  
9 *Education and Sport Pedagogy, 17(4)*, 367-381.
- 10 Hay, P. (2006) *Assessment for learning in physical education*. In: Kirk, D., Macdonald,  
11 D. and O'Sullivan, M. *The Handbook of Physical Education*. London: Sage,  
12 p312-325.
- 13 Hay, P., & Penney, D. (2009). Proposing conditions for assessment efficacy in physical  
14 education. *European Physical Education Review, 15(3)*, 389-405.
- 15 Herrmann, C., Gerlach, E., & Seelig, H. (2015). Development and validation of a test  
16 instrument for the assessment of basic motor competencies in primary  
17 school. *Measurement in Physical Education and Exercise Science, 19(2)*, 80-90.
- 18 Hoepfl, M. C. (1997). Choosing qualitative research: A primer for technology education  
19 researchers, *Journal of Technology Education, 9*, 47-63.
- 20 James, A. R., Griffin, L. L., & France, T. (2005). Perceptions of assessment in  
21 elementary physical education: A case study. *Physical educator, 62(2)*, 85.

- 1 Iacono, V. L., Symonds, P., & Brown, D. H. (2016). Skype as a tool for qualitative  
2 research interviews. *Sociological Research Online*, 21(2), 12.
- 3 Kvale, S., & Brinkmann, S. (2009). Learning the craft of qualitative research  
4 interviewing. *Thousands Oaks: Sage Publications*.
- 5 Lander, N. J., Barnett, L. M., Brown, H., & Telford, A. (2015). Physical education  
6 teacher training in fundamental movement skills makes a difference to  
7 instruction and assessment practices. *Journal of Teaching in Physical  
8 Education*, 34(3), 548-556.
- 9 Lander, N., Morgan, P. J., Salmon, J., & Barnett, L. M. (2016). Teachers' perceptions of  
10 a fundamental movement skill (FMS) assessment battery in a school  
11 setting. *Measurement in Physical Education and Exercise Science*, 20(1), 50-62.
- 12 Lander, N., Morgan, P. J., Salmon, J., Logan, S. W., & Barnett, L. M. (2017). The  
13 reliability and validity of an authentic motor skill assessment tool for early  
14 adolescent girls in an Australian school setting. *Journal of science and medicine  
15 in sport*, 20(6), 590-594.
- 16 Longmuir, P. E., Boyer, C., Lloyd, M., Yang, Y., Boiarskaia, E., Zhu, W., & Tremblay,  
17 M. S. (2015). The Canadian Assessment of Physical Literacy: methods for  
18 children in grades 4 to 6 (8 to 12 years). *BMC Public Health*, 15(1), 767.
- 19 Lopes, V. P., Rodrigues, L. P., Maia, J. A., & Malina, R. M. (2011). Motor coordination  
20 as predictor of physical activity in childhood. *Scandinavian journal of medicine  
21 & science in sports*, 21(5), 663-669.

- 1 Lubans, D. R., Morgan, P. J., Cliff, D. P., Barnett, L. M., & Okely, A. D. (2010).  
2 Fundamental movement skills in children and adolescents. *Sports*  
3 *medicine*, 40(12), 1019-1035.
- 4 MacPhail, A., & Halbert, J. (2010). 'We had to do intelligent thinking during recent  
5 PE': students' and teachers' experiences of assessment for learning in post-  
6 primary physical education. *Assessment in Education: Principles, Policy &*  
7 *Practice*, 17(1), 23-39.
- 8 Morgan, P., & Bourke, S. (2008). Non-specialist teachers' confidence to teach PE: the  
9 nature and influence of personal school experiences in PE. *Physical Education*  
10 *and Sport Pedagogy*, 13(1), 1-29.
- 11 Morgan, P., & Hansen, V. (2007). Recommendations to improve primary school  
12 physical education: Classroom teachers' perspective. *The journal of educational*  
13 *research*, 101(2), 99-108.
- 14 Morgan, P. J., Barnett, L. M., Cliff, D. P., Okely, A. D., Scott, H. A., Cohen, K. E., &  
15 Lubans, D. R. (2013). Fundamental movement skill interventions in youth: a  
16 systematic review and meta-analysis. *Pediatrics*, 132, 1361-1383
- 17 Morley, D., Till, K., Ogilvie, P., & Turner, G. (2015). Influences of gender and  
18 socioeconomic status on the motor proficiency of children in the UK. *Human*  
19 *movement science*, 44, 150-156.
- 20 Ní Chróinín, D., & Cosgrave, C. (2013). Implementing formative assessment in primary  
21 physical education: Teacher perspectives and experiences. *Physical Education*  
22 *and Sport Pedagogy*, 18(2), 219-233.

- 1 O'Loughlin, J., Chróinín, D. N., & O'Grady, D. (2013). Digital video: The impact on  
2 children's learning experiences in primary physical education. *European*  
3 *Physical Education Review*, 19(2), 165-182.
- 4 Ontario Ministry of Education. (2015). *The Ontario Curriculum, Grades 1-8: Health*  
5 *and Physical Education*. Available at  
6 <http://www.edu.gov.on.ca/eng/curriculum/elementary/health.html>.
- 7 Patton, M. Q. (2002). Qualitative interviewing. *Qualitative research and evaluation*  
8 *methods, 3<sup>rd</sup> Ed*, London: SAGE.
- 9 Payne, V. G., & Isaacs, L. D. (2011). *Human Motor Development: A Lifespan*  
10 *Approach. 8th Ed*. New York: McGraw-Hill.
- 11 Robertson, M. A. & Halverson, L. E. (1984). *Developing Children – Their Changing*  
12 *Movement: A Guide for Teachers*. Lea & Febiger, Philadelphia, USA.
- 13 Schilling, F., & Kiphard, E. J. (1974). *Körperkoordinationstest für Kinder: KTK*. Beltz.
- 14 Seefeldt, V. (1980). Developmental motor patterns: Implications for elementary school  
15 physical education. *Psychology of motor behavior and sport*, 36(6), 314-323.
- 16 Society of Health and Physical Educators America (2016). *National PE standards*.  
17 Available at <http://www.shapeamerica.org/standards/pe/>.
- 18 Stodden, D., Langendorfer, S., & Robertson, M. A. (2009). The association between  
19 motor skill competence and physical fitness in young adults. *Research quarterly*  
20 *for exercise and sport*, 80(2), 223-229.

- 1 Tidén, A., Lundqvist, C., & Nyberg, M. (2015). Development and initial validation of  
2 the NyTid test: a movement assessment tool for compulsory school  
3 pupils. *Measurement in Physical Education and Exercise Science*, 19(1), 34-43.
- 4 Tompsett, C., Sanders, R., Taylor, C., & Cobley, S. (2017). Pedagogical approaches to  
5 and effects of fundamental movement skill interventions on health outcomes: a  
6 systematic review. *Sports Medicine*, 47(9), 1795-1819.
- 7 Youth Sport Trust. (2017) *Start to Move assessment tool*. Available at  
8 <http://itunes.apple.com/gb/app/movement-assessment-tool/id1253503754?mt=8>