Exploring primary pre-service teachers’ use of ‘assessment for learning’ while teaching primary physical education during school placement

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**Background:** Despite the consensus regarding the value of school placement experiences for primary pre-service teachers (PSTs) in teacher education programmes, challenges remain in PSTs’ ability to transfer the knowledge gained on assessment for learning (AfL) in their initial teacher education (ITE) programmes to the reality of the primary classroom. Furthermore, although there has been a significant growth of interest in assessment literacy and how this can impact teachers’ use of AfL to enhance teaching and support student learning, there has been no research relating to primary PSTs’ assessment literacy in enacting AfL in physical education.

**Purpose:** The purpose of this study was to examine the extent that primary PSTs demonstrate assessment literacy in their enactment of AfL while teaching physical education during school placement.

**Methods:** Participants included the teacher educator as researcher and four PSTs who were completing a two-year Professional Master of Education in primary education to qualify as primary teachers. Using a longitudinal action research approach, the teacher educator generated data through participant observer field notes, primary PST reflective journals and individual primary PST interviews. The approach to data analysis involved data reduction, data display and conclusion drawing. Verification took place after each phase using inductive and deductive data analysis, thematic data analysis and constant comparative analysis.

**Findings:** The use of teacher educator modelling, mentoring, and scaffolding with primary school students, during upskill sessions and in-situ during the PST school placements, enhanced the PSTs’ assessment literacy in the enactment of AfL in primary physical education to a greater extent than when implemented during the module with their PST peers. However, while greater student autonomy, more effective planning, and connections between curriculum, pedagogy and assessment were evident, AfL strategies such as self- and peer-assessment were not as evident in PSTs’ overall assessment literacy.

**Conclusions:** The teacher educators’ role in modelling and mentoring PSTs on school placement made a significant impact on PSTs’ delivery of AfL. Based on the findings of this study, opportunities for PSTs to practice AfL with primary school students during the physical education module developed higher levels of assessment literacy for
PSTs during school placement than was facilitated through theoretical discussion and content. This paper highlights the difficulties in developing PST critical engagement with assessment data and the rationale for PST reluctance around enacting self- and peer-assessment. While student relational dynamics could have impacted on this, it could be concluded that such AfL strategies require time to practice and develop. In addition, the duration of each block of school placement may not have facilitated PSTs with adequate time to implement peer and self-assessment.

**Key words:** assessment literacy, initial teacher education, primary school, school placement
Introduction

Much criticism remains surrounding the impact of teacher education programmes on pre-service teacher (PST) preparation for the reality of the classroom. The main purpose of school placement is to continue PSTs’ professional development in the context of the school setting (Hascher and Kittinger, 2014), and to transfer the different types of knowledge gained from initial teacher education (ITE) programmes to a setting that provides specific frameworks and support (Ball and Forzani 2009). Despite the consensus regarding the value of school placement experiences for PSTs in teacher education programmes (Langdon, Alexander, Dinsmore, and Ryde 2012), challenges remain in PSTs’ ability to transfer the knowledge gained in their ITE programmes to the reality of the primary classroom (Hadyn-Davies, Kaitell, Randall, and Spence 2010). One particular challenge identified by Darling-Hammond (2006) is ‘the difficult process of helping people learn to enact their intentions in complex settings’ (p. 41). The tendency for PSTs is often to abandon the pedagogical principles learned in ITE programmes and exhibit more survival strategies that enable them to overcome the inadequacies that a more experienced teacher may not possess (Shoval, Erlich and Fejgin 2008).

One specific area of concern related to PSTs’ transfer of knowledge is assessment and the level to which PSTs are enacting assessment principles in their teaching (Leirhaug and MacPhail 2015). Considered as integral to teaching and learning, assessment continues to remain a troublesome area with PSTs demonstrating low levels of assessment literacy and a lack of ability surrounding the application of theory into practice when on school placement (Darling-Hammond, 2006). The impact of assessment as an everyday practice to enhance teaching and learning has been the subject of increased research (Black 2013; Wiliam and Leahy 2015; DeLuca, Chapman-Chin, LaPointe-McEwan and Klinger 2018). Research has highlighted that many PSTs rely too much on summative approaches to assessment with little
consideration given to ongoing formative approaches (Lopez-Pastor, Kirk, Lorente Catalan, MacPhail, and MacDonald 2013).

There has been a greater appreciation for assessment in educational policy, which has been described as ‘viral and normative in the networks of educational policy makers across the globe’ (Looney 2014, p.234). It is also envisaged that such opportunities for more explicit attention to assessment in policy documents have the potential to develop higher levels of assessment literacy among teachers that enhances and supports teaching and learning (Alkharusi et al. 2011). Nevertheless, no empirical research that reports on PST enactment of AfL or assessment literacy of primary PSTs in teaching primary physical education is evident., highlighting a gap in the body of research conducted to date. This study investigates the extent to which primary PSTs in Ireland demonstrate assessment literacy in their enactment of AfL while teaching physical education on school placement. An overview of assessment literacy and AfL provides the framework that guides the enactment of AfL strategies in this study.

Assessment literacy

Mertler (2004) defines assessment literacy as the ability to identify effective assessment methods, select practices that ensure dependable data is retrieved on student achievement, and communicate assessment results in a manner that involves and motivates student learning. Stiggins (1991) explains that to be assessment literate requires an understanding of the quality of the assessment in relation to student achievement and using assessments that communicate clear, specific, and rich definitions of the achievement that is valued.

Given the considerable benefits to both teaching and learning of being assessment literate (Popham 2004), Stiggins (2014) advises that we cannot simply continue to ‘turn a blind eye’ to issues relating to lack of competence exhibited among practitioners in relation to assessment literacy (p. 72). Based on this perspective, efforts have been made in ITE to
improve PST assessment literacy (Volante & Fazio, 2007). Research highlights how the provision of courses directly relating to measurement and assessment in ITE programmes has resulted in PSTs displaying greater assessment literacy than in-service teachers (Alkharusi et al. 2011). The same authors state that such an approach must be coupled with experiences in authentic classroom settings for optimum gains to be achieved.

The conceptual assessment literacy framework (Hay and Penney, 2013) proposes four components, which are captured in Table 1. In order to display assessment literacy, one must show proficiency across each of the components, where each component is inter-dependent to the others, e.g., one must show assessment comprehension to demonstrate effective assessment application.

**Table 1.** Assessment literacy components proposed by Hay and Penney (2013)

<table>
<thead>
<tr>
<th>Component</th>
<th>Focus of Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment comprehension</td>
<td>This focuses on:</td>
</tr>
<tr>
<td></td>
<td>- teacher and PST knowledge and understanding of what assessment is</td>
</tr>
<tr>
<td></td>
<td>- teacher and PST expectations of when and how to use it</td>
</tr>
<tr>
<td>Assessment application</td>
<td>This focuses on:</td>
</tr>
<tr>
<td></td>
<td>- teacher and PST application of assessment in teaching</td>
</tr>
<tr>
<td></td>
<td>- implementation of assessment including the involvement and engagement of students in the assessment process</td>
</tr>
<tr>
<td></td>
<td>- how and when the PSTs apply AfL</td>
</tr>
<tr>
<td>Assessment interpretation</td>
<td>This focuses on:</td>
</tr>
<tr>
<td></td>
<td>- how teachers and PSTs make sense of, use, and act on assessment data that is collected through AfL</td>
</tr>
<tr>
<td></td>
<td>- how teachers and PSTS negotiate the social relations of assessment</td>
</tr>
<tr>
<td>Critical engagement with assessment</td>
<td>This focuses on:</td>
</tr>
<tr>
<td></td>
<td>- displaying a critical awareness of the impact or consequences of assessment</td>
</tr>
<tr>
<td></td>
<td>- challenging the ‘naturalness’ of assessment practices, performances and outcomes.</td>
</tr>
</tbody>
</table>
Given that no research is evident regarding PSTs’ assessment literacy in the use of AfL in teaching primary physical education, the literature pertaining to AfL will be discussed.

**Assessment for Learning**

AfL is integral to teaching and should be part of everyday practice by students, teachers, and peers that seeks, reflects upon and responds to information from dialogue, demonstration and observation in ways that enhance ongoing learning (Klenowski 2009). The Assessment Reform Group (2002) define AfL as ‘the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there’ (p.1). Such dynamic day-to-day interactions facilitate opportunities for teachers to transform their teaching into action plans that serve to progress student learning through engaging with the data gained through effective assessments (Hay and Penney 2013). AfL focuses on:

(i) embedding assessment within practice – where AfL is considered as part of instruction and not an added element (Wiliam 2011);

(ii) the alignment of curriculum, pedagogy and assessment - this aspect is based on the belief that each element is inter-dependant of the other (Penney, Brooker, Hay, and Gillespie 2009); and

(iii) the consistent placement of the students ‘inside the assessment process’ – this highlights the need for students to be involved in direct consultation regarding their learning with teachers and peers (Stiggins 2005).

In addition to the aspects of AfL mentioned Clarke (2009) proposes a number of AfL strategies that she considers key to the effective enactment of AfL. These are (1) provision of a sharing of learning objectives with students, (2) Co-generation of the success criteria between teacher and student, (3) Use of questioning aligned with the success criteria, (4) Observation guided by the success criteria (5) Feedback that highlights achievements and
refines focus for improvement in line with success criteria, and (6) the use of peer and self-assessment.

Assessment and Primary PE

Historically, the tendency was for physical education teachers to focus on the practice of how they assess rather than focusing on the impact of assessments they enact on teaching and learning (Hay 2006). Knowledge of how to apply theory into practice and the time required to conduct effective assessment have all been highlighted as key barriers to enacting formative assessment by physical education teachers (Ní Chróinín and Cosgrave 2013).

Some insights are evident in the research of teacher assessment literacy. Dinan-Thompson and Penney (2015) revisited the framework set out by Hay and Penney (2013) (see Table 1) and found that the majority of assessments used for teaching physical education in the primary school were skill and ability based, where outputs and comparative practices were common practices (Hay, 2006). Although teachers appeared to engage to some level with the elements articulated by Hay and Penney (2013), alignment to curriculum and pedagogy occurred sporadically (Ní Chróinín and Cosgrave 2013). Furthermore, while there is some evidence of peer assessment in primary physical education, assessments remain predominantly teacher-led and lack sufficient student involvement, a key element of AfL (Ní Chróinín and Cosgrave 2013).

A focus on accountability and greater emphasis on summative assessment by teachers has resulted in issues around teachers’ critical engagement with assessment data when engaging in formative assessments, such as validity of judgements and knowledge of what and how to assess (Dinan-Thompson & Penney, 2015). There remains a dearth of assessment specific research at primary school level. While Dinan-Thompson and Penney (2015) explored the assessment literacy of primary school teachers teaching physical education, there appears to be no research that explicitly investigates the assessment literacy of primary
PSTs enacting AfL while teaching physical education. Given the importance of assessment, and the implications for people across all education systems (Hay & Penney, 2013), this study aimed to investigate the assessment literacy of PSTs’ use of AfL in primary physical education and identify any potential ‘missing ingredients’ alluded to in the research on teachers (Dinan-Thompson, 2013). Acknowledging the need for greater understanding around curriculum, pedagogy and assessment (Hay and Penney, 2013), and the potential for ‘deeper pedagogic action’ (Dinan-Thompson, 2013, p.138), this research seeks to inform ITE programmes on issues encountered by PSTs.

**Assessment and primary PSTs in ITE**

Many primary PSTs indicate a lack of knowledge on how to effectively make judgements of student progress in physical education (Randall, Richardson, Swaithes, and Adams 2016). Furthermore, the knowledge of how to interpret and critically engage with the information remains a challenge for PSTs (Randall et al. 2016).

In one study, PSTs who were engaged in an assessment module for each year of their four-year programme consistently recorded low levels of confidence and self-efficacy in relation to assessment each year (Volante and Fazio 2007). In another study, Beziat, and Coleman (2015) found no significant change in the assessment literacy of primary PSTs who engaged in a classroom assessment module. These results differ from those of DeLuca and Klinger (2010) who found that primary PSTs who engaged in a module on assessment were significantly more confident in their assessment knowledge than those who elected not to complete the module. It may be that the conflicting results arise from variance in the approaches employed in the delivery of each module, providing little insight into the rationale for such results or into the effectiveness of assessment modules.

Despite this variance, calls remain for teachers to gain practical knowledge about assessment strategies and tools for assessment, through specific courses on classroom
assessment (Volante & Fazio, 2007). However, this may not be a simple solution to the problem. As indicated earlier, research has highlighted how PSTs are often unable to transfer their assessment literacy into their enactment of assessment practices (Ogan-Bekiroglu and Suzuki 2014; Wissehr and Siegel 2011). While PSTs recognised the need to align assessment with learning outcomes and instruction, and included a variety of assessment methods in their planned lesson, often the methods employed by the PSTs did not fully align with those presented by the PSTs in the planned lesson (Siegel and Wissehr 2011). However, no research exists to provide a rationale for the gaps in PSTs’ application of assessment methods. Given the evident deficit of research relating to the assessment literacy of primary PSTs teaching physical education, the importance of assessment, and the implications for people across all education systems (Hay & Penney, 2013), this study aims to address PST assessment literacy specifically in the implementation of AfL in the teaching of primary physical education while PSTs are engaging in school placement. Acknowledging the need for greater understanding around curriculum, pedagogy and assessment (Hay and Penney, 2013), and the potential for ‘deeper pedagogic action’ (Dinan-Thompson, 2013, p.138), this research seeks to inform ITE programmes on issues encountered by PSTs and identify any potential ‘missing ingredients’ alluded to in the research on teachers (Dinan-Thompson, 2013).

Methodology

This study is a longitudinal qualitative study using an action research approach (McNiff, 1998). Action research is ultimately about improving one’s practice by learning through engaging in research in the researcher’s ‘pedagogical space’ (Casey, Fletcher, Schaefer, and Gleddie 2018, p. 13) and the feeding of the knowledge gained directly into one’s practice (Elliott, 1991). McNiff (2002) describes action research as a continuous cycle and recommends ‘a systematic process of observe, describe, plan, act, reflect, evaluate and
modify’. Multiple cycles within the cycles of action research occurred throughout this study (Casey et al. 2018). These cycles occurred on both the micro and macro level. Micro levels of action research occurred throughout each individual lesson taught by the PSTs, and throughout each individual phase. This involved the teacher educator as the researcher applying the above noted stages of McNiff (2002) when completing data collection. Macro levels of action research occurred between each phase where the teacher educator evaluated, planned, modified and acted upon the approach to engaging the PSTs in upskill sessions, then evaluated the impact of this on their overall assessment literacy in the subsequent phase. The action research approach is detailed under the heading ‘Design’. Ethical approval was granted by the Research Ethics Committee in the university in which the principal investigator resided.

**Physical Education in Irish primary schools**

In Irish primary schools, generalist teachers are responsible for teaching the same group of students for one academic year and for teaching the entire Irish primary curriculum (12 curricular areas including physical education). The suggested weekly time allocated for physical education is sixty minutes (DES 1999). The Primary School Curriculum (DES 1999) advises that information gathered through assessment should be recorded to assist teachers in future planning and for communicating the progress of students with teachers, students, and parents. Recommended strategies include the use of learning intentions, observation with feedback, rubrics, performance tasks, and student self-assessment (NCCA 2007). It is advised that all students’ needs and abilities be facilitated through utilising a range of assessment tools. Despite this, little has been done in terms of provision of resources or in continuing professional development to support teachers in implementing effective AfL strategies in physical education at primary school level (MacPhail and Murphy 2017).
Participants and Context

The participants in the study are the teacher educator as researcher (first author) and four PSTs who were engaged in a two-year Professional Master of Education (PME) for primary teaching. PSTs (from the 60 PSTs enrolled on the programme) whose school placement schedule was able to accommodate the teacher educator’s availability for observations were identified. Acknowledging the time that the teacher educator could allow to feasibly visit schools, five PSTs were chosen for the study. All PSTs on the programme were invited to participate in the upskill workshops if they wished.

The teacher educator delivers ITE in primary physical education in an Institute of Education in Ireland. The PSTs had completed a nine-week module in primary physical education taught through an AfL philosophy where the six components of AfL noted earlier (Clarke 2009) were discussed and modelled by the teacher educator in the delivery of the module. While no explicit module on assessment is included in the PME programme, assessment principles and practices are blended into all modules of the PME programme. The teacher educator played a central role, through use of modelling, mentoring and scaffolding, that assisted in developing the PSTs’ assessment literacy and in the co-construction of knowledge with the PSTs in enacting AfL. Purposeful sampling (Patton 2002) was used to facilitate participant observation by the teacher educator while the PSTs were completing all school placement requirements. Pseudonyms are used to provide anonymity for the PSTs throughout the findings. Assuming a subjectivist epistemology, the teacher educator acknowledges how her role as a teacher educator may impact on the actions of the PSTs. The qualitative methods employed in this study were observation, dialogue and discussion that allowed for the PSTs’ perspectives to be represented based on their individual school placement contexts. Triangulation of the multiple data sources ensured trustworthiness was
achieved in this study. This involved the use of the teacher educator’s field notes, interview
transcripts and PST reflective journals.

*Design*

The teacher educator and PSTs were engaged in a seven-phase longitudinal study following a
nine-week primary physical education module in their first semester (Table 2).

Table 2. Summary of phases of the study

<table>
<thead>
<tr>
<th>ITE PE Prog</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
<th>Phase 6</th>
<th>Phase 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-week module</td>
<td>School placement</td>
<td>Upskill sessions</td>
<td>School placement</td>
<td>Upskill sessions</td>
<td>School placement</td>
<td>Upskill sessions</td>
<td>School placement</td>
</tr>
</tbody>
</table>

In year one of their programme PSTs undertook two three-week blocks of school placement
(phases 1 & 3), one in a senior class (9 to 12 year olds), and one in a junior class (4-8 year
olds). In year two they completed a four-week (phase 5) and a three-week (phase 7) block of
school placement as part of an overall ten-week block of school placement, (Table 2). Three
upskill phases aimed at developing the PSTs’ assessment literacy in the enactment of AfL
took place between each phase of school placement (i.e., phases two, four and six). All PSTs
on the programme were invited to participate in the upskill workshops if they wished.

*School placement (Phases one, three, five and seven)*

The teacher educator was a participant observer in each school placement phase (Table 3) for
each PST and maintained field notes throughout the observations. Post placement, one-to-one
semi-structured interviews took place the week after the PSTs completed each school
placement.

Table 3. Outline of school placement phases in this study.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Phase 1</th>
<th>Phase 3</th>
<th>Phase 5</th>
<th>Phase 7 (Block 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School placement</td>
<td>School placement</td>
<td>School placement</td>
<td>School placement</td>
<td>School placement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>(Block 1)</th>
<th>(Block 2)</th>
<th>(Block 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>3 weeks</td>
<td>3 weeks</td>
<td>3 weeks</td>
</tr>
<tr>
<td><strong>Data collection</strong></td>
<td>Field notes (R)</td>
<td>Field notes (R)</td>
<td>Field notes (R)</td>
</tr>
<tr>
<td></td>
<td>Post lesson debrief (R &amp; PST)</td>
<td>Post lesson debrief (R &amp; PST)</td>
<td>Post lesson debrief (R &amp; PST)</td>
</tr>
<tr>
<td></td>
<td>Semi structured interview (PST)</td>
<td>Semi structured interview (PST)</td>
<td>Semi structured interview (PST)</td>
</tr>
<tr>
<td><strong>Lessons taught</strong></td>
<td>Alice – 3/3</td>
<td>Nicola – 1/3</td>
<td>Jessica – 2/3</td>
</tr>
<tr>
<td></td>
<td>Alice – 0</td>
<td>Nicola – 5/6</td>
<td>Jessica – 0</td>
</tr>
<tr>
<td></td>
<td>Alice – 2/4</td>
<td>Nicola – 3/4</td>
<td>Jessica – 1/6</td>
</tr>
</tbody>
</table>

**Note:** R = Researcher

**Upskill sessions (Phases two, four and six)**

In advance of each block of school placement, the PSTs engaged in workshop-style upskill sessions (Steinert, Boillat, Meterissian, Liben and McLeod 2008) (Table 4). These workshops, which were informed by one-to-one semi-structured interviews, focus group interviews, field notes, and reflective journals, highlighted the extent that PSTs demonstrated assessment literacy in their enactment of AfL.

**Table 4.** Upskill content.

<table>
<thead>
<tr>
<th>Upskill phase</th>
<th>Phase Two (M)</th>
<th>Phase Four (M, MD, S)</th>
<th>Phase Six (M, MD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Defining assessment (C)</td>
<td>Debrief of experiences of PSTs</td>
<td>In school individual focused upskill (C, I, CE)</td>
</tr>
<tr>
<td>Exploration of forms of assessment (C, A)</td>
<td>Information sharing of what worked well (A)</td>
<td>Self and peer assessment (A, CE)</td>
<td></td>
</tr>
<tr>
<td>AfL and theory (C)</td>
<td>AfL and effective implementation (C, A, I, CE)</td>
<td>Sharing of PST strategies (I, CE)</td>
<td></td>
</tr>
<tr>
<td>AfL strategies (C, A)</td>
<td>Lesson modelling by teacher educator with students (C, A, I)</td>
<td>Use of video taken in Phase Four (A, I, CE)</td>
<td></td>
</tr>
<tr>
<td>Use of CEPEC Resources (A)</td>
<td>Small group work and video debrief (A, I, CA)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Implementation of AfL in lesson delivery (A)(S)

Self and peer assessment and exploring how PSTs could enact it based on teacher educator modelled lesson (C,A)

Note: AfL=Assessment for Learning; NCCA= National Council for Curriculum and assessment; PST= pre-service teachers; CEPEC = Colleges of Education Physical Education Consortium; C= comprehension; A=application; I=Interpretation; CE=Critical engagement; M=Mentoring; MD=Modelling; Scaffolding

Data Collection

Field notes

Data was generated through field notes captured while the teacher educator assumed the role of participant observer throughout all school placements (Phillippi and Lauderdale 2017).

The field notes recorded evidence of where and when the PSTs implemented AfL and identified potential opportunities for PSTs to use AfL in their teaching of physical education.

Factors that may have impacted on the inclusion of AfL in their teaching, e.g. behaviour management, were also recorded (Patton 2015).

Post lesson debrief

A short post-lesson debrief (Parsons and Stephenson 2005) took place after each lesson, where advice from the teacher educator relating to the PSTs’ enactment of AfL in their teaching was provided, including specific feedback and field notes on their use (or not) of AfL.

PST Reflective Journal

The PST reflective journal, guided by prompt questions (Denscombe 2007), provided an insight into PSTs’ experiences of using, or not, the AfL strategies proposed by Clarke (2009) while teaching physical education. Entries in the reflective journal were probed further during the semi-structured interviews.
Post-placement semi-structured individual interviews, conducted in phases one, five, and seven (Kvale 2006) explored PSTs’ backgrounds; experiences of teaching physical education on school placement; experiences of the ITE physical education module; use of methodologies; use of AfL strategies; demonstration of assessment literacy using the four components outlined by Hay and Penney (2013) (see Table 1). Each interview was audio recorded and subsequently transcribed. The PSTs read through their transcript to ensure their views had been captured accurately.

Focus group interviews took place in phases three and seven post school placement, where all of the PSTs involved met and discussed the successes and challenges of embedding AfL in their teaching of physical education. Focus groups provided a platform for variances in opinions on PST experiences while on school placement, and the complexities associated within each individual context.

Data Analysis
Three stages for data analysis involved data reduction, data display and conclusion drawing and verification (Miles and Huberman, 1994). Data analysis took place after phase three, phase five and phase seven using inductive and deductive data analysis across all data (interview transcripts, field notes, reflective journals) and constant comparative analysis (Lincoln and Guba 1985) from previous phases using the AfL strategies and theoretical framework. This allowed for developments in the PST’s enactment of AfL to be identified in line with developments in PST assessment literacy. The data was positioned within the relevant components of assessment literacy for each phase. Reflexivity was central to the data analysis process as the data emerged throughout each cycle of action research (rather
than upon cessation of the data collection process), where each phase of data collection
informed the subsequent phase in this study (Stake 1995).

The process of data analysis began after phase one, where the teacher educator read
the interview transcripts, reflective journals, and field notes, writing memos and notes to
inform phase two. The interview transcripts were read and all the data was grouped and
organised under specific themes and headings informed by the conceptual framework and
AfL strategies e.g. assessment literacy, PST use of feedback in physical education. The
transcripts from the focus groups and semi-structured interviews were examined in their
entirety, line by line, and key phrases that indicated challenges in enacting AfL and
developments in PST assessment literacy were highlighted manually. Next, the key phrases
were examined and codes assigned (data reduction). These codes were examined and
developed into themes (data display) using the conceptual framework. This occurred after
each phase of the study as data analysis served to inform the content of the upskill sessions.
Summary charts highlighting the extent to which the PSTs enacted AfL in their teaching of
physical education were created from data gathered during the teacher educator’s observation
and from the reality as experienced by the PSTs as expressed during interview.

The final phase of data analysis involved collapsing and synthesising all data across
the entire study using the conceptual framework of assessment literacy (Hay and Penney
2009). The data across all phases were collated for each PST and categorised under the four
components of Hay and Penney (2013) to track each PST’s enactment of AfL and identify the
extent of their assessment literacy with respect to AfL e.g. PST use of success criteria was
tracked in relation to whether the PST demonstrated assessment comprehension if they
emphasised the need for student involvement during the interview. Triangulation of the data,
in order to ensure reliability and credibility of the study, was achieved through the use of
multiple sources for data collection, affirmation by the PSTs of the interview transcripts and through sustained immersion in the field by the teacher educator (Creswell 2008).

**Findings and discussion**

The findings of this study are presented using four components of the conceptual framework of assessment literacy (Hay and Penney 2013). It aims to capture and present the complexities for PSTs in enacting AfL and highlight the most powerful data in representing the developments in PSTs’ assessment literacy in enacting AfL in their teaching of primary physical education during school placement.

**Assessment comprehension**

In the early phases of the research, the PSTs indicated that the purpose of assessment was to track students’ performance and to know ‘how they were getting on’ (Interview 1, Phase 1), demonstrating what Dinan-Thompson and Penney (2015) call a ‘narrow’, and somewhat superficial, understanding of assessment. The PSTs considered AfL as an added dimension to teaching that informed the teachers of progression but served very little purpose outside of that. The PSTs’ comments did not display the multi-direction relational system as highlighted by Penney et al. (2009) where quality learning experiences should be demonstrated within and across curriculum, pedagogy and assessment. An apparent gap in the PSTs’ assessment knowledge was in relation to the need for students to be involved in the development of their own learning (Annerstedt and Larsson 2010).

Assessment was predominantly linked to the performance and achievement of levels in skill development. No reference was made to how the use of AfL can contribute to pedagogy and allow students a level of autonomy over their own learning (Black and Wiliam 1998). By phase seven a shift in understanding was evident with the PSTs, who initially in phase one had viewed assessment as an added dimension in their teaching, considering AfL as an everyday practice and an embedded element of teaching (Klenowski 2009). This shift
began to emerge following phase two where upskill sessions, delivered by the teacher educator and informed by the data collected in phase one, included elements that sought to improve the PSTs’ knowledge and understanding of AfL.

Given that assessment practices should be integrated within methods and curriculum courses (Shepard 2000), the ITE primary physical education module adopted an integrated approach. The data obtained in this study showed that the module failed to adequately develop PST assessment comprehension across all forms of assessment. The focus was solely on AfL and did not facilitate PST understanding of other forms of assessment (such as summative assessment). This resulted in PSTs being unable to differentiate between each form of assessment, similar to previous research which showed that teachers were unable to provide evidence of assessment comprehension overall, or in relation to the purpose and benefits of AfL (Dinan-Thompson and Penney 2013). In phase four the teacher educator modified the approach used in the upskill sessions, following the observations and data generated across all sources, to further enhance the enactment and understanding of AfL in the PSTs’ teaching of primary physical education. To achieve this the teacher educator employed modelling, mentoring, and scaffolding with primary school students in the ITE programme.

The research showed that greater alignment between curriculum, pedagogy, and assessment (facilitated by AfL) and greater assessment interpretation enabled Monica to see the progression of each child and brought a sense of achievement and inspired confidence in Monica. She explained ‘I think when you have such clear objectives and you split them up so arms one week, then legs, you can really see what each child is achieving and it gives you such a sense of accomplishment’ (interview, P5). Similarly, Alice’s reflections not only emphasise greater assessment comprehension but also highlight the importance of interpreting the assessment data retrieved:
even observing two and three students you can see they’re not ready for that - let’s put that on to your next week. And you’re actually looking at the kids to understand are they ready for the next part and let’s focus on this. It also keeps it structured for you so I feel more relaxed because I know when they can reach these steps let’s move on to the next thing rather than just me racing through the lesson and trying to get stuff done that there is no point moving on if they hadn’t got it. (Interview, P7).

Referring back to the emphasis on AfL as an everyday practice (Klenowski, 2009), Alice’s reflections show greater assessment comprehension of the impact of AfL to facilitate more progressive planning future lessons. She explained; ‘I knew from observing and questioning them that I needed to go over certain parts, they knew also’ (Interview, P7). She demonstrated an acute awareness of the impact of AfL in facilitating amendments to the content throughout the teaching of individual lessons, thus providing optimum opportunities to enhance student achievement.

Assessment application

In phase one, the PSTs’ assessment comprehension did not demonstrate an awareness of the relationship required between curriculum, pedagogy and assessment, thus leading to low levels of assessment application. Reflecting on the field note observations and descriptions, the teacher educator planned for an increased focus on how to effectively align curriculum, pedagogy and assessment in later phases of the research. The PSTs initially taught stand-alone content that lacked progression from one lesson to the next, and the omission of reference to the learning objectives in lesson conclusions resulted in students receiving little consolidation of the learning encountered in the lesson. Engaging the PSTs in theory relating to assessment, generating awareness of how to plan progressive lessons and planning for enactment of AfL in their lessons in phase two resulted in small improvements to PST assessment application. However, the use of teacher educator modelling in phase four, had a greater impact and resulted in PSTs using AfL as a means of assessing student progressions and to ensure students progressed in their performance of the skills at a suitable pace. The teacher educator field notes evidence this, ‘Nicola has really interpreted the students’ levels
from the last lesson accurately and is now building on where they were instead of introducing new content’ (Field Notes, P5, L3). Similarly, Jessica commented, ‘Using it (AfL) let me see where they were struggling, before I would just have taught isolated content’ (Interview P5). This demonstrates that the need to plan for the implementation of AfL is clear and should be used in conjunction with pedagogy and curriculum (Hay & Penney, 2013).

Monica explained that inclusion of students in the assessment process was imperative, as the students ‘know what they did and that they can do it because we have talked about how to do it (reference to co-generation of success criteria)’ (Interview, P5). She further alluded, in the same interview, to how including them in the process informs them of whether they have achieved the learning objectives. Nicola highlighted the structure that embedding AfL in her practice provided and the improved focus for her and the students’ engagement that resulted from that. Similar to the findings of Ní Chróinín and Cosgrave (2013), Nicola explained that the co-generation and discussion of success criteria provided a scaffold and source of reference throughout her lessons in phase five stating how ‘it was useful for the children but also for me, I could glance up, but the children loved checking it’ (Interview, P5). Furthermore, the use of explicit success criteria facilitated more effective questioning of the students in line with the success criteria allowing her to direct them to the list they generated with her. The students began to ‘understand the scaffolding’, facilitated through greater student involvement in the assessment process, which promoted greater focus and understanding to the assessment tasks in phase five (Stiggins 2005, p.328). Nicola explained how giving students ownership of their learning facilitated greater levels of student engagement, and involvement. Alice discussed the impact of peer assessment on student autonomy;

Coming up with the criteria and then assessing themselves ‘what do I think I could do better?’ and also with their partner. It’s making them feel like the teacher and they feel more involved in the PE lesson I suppose (Monica, Interview, P5)
Acknowledgement of the role of students.

The teacher educator’s observations and field notes in phase one highlighted an approach where the enactment of AfL was predominantly teacher led and did not provide the student autonomy associated with AfL where the students are active agents in their own learning (Black and Wiliam 1998). The students were not involved in the generation of success criteria, but were informed of the learning objectives prior to the lesson, an element considered essential in the literature (Clarke 2009). In phase one, all PSTs shared the learning objectives with the students, but in a way that lacked explicitness in their articulation. This provided little direction for student learning throughout the lesson. The field notes informed the content planned by the teacher educator in the upskill sessions in phase two. In a bid to develop the PSTs’ assessment literacy, foundational knowledge of assessment and AfL was included as were examples of how to embed AfL in the teaching of primary physical education.

This progression could be seen where, in phase three, Alice continued to introduce the learning objectives prior to the lesson and adapted her approach in the provision of success criteria to facilitate the students. Although student autonomy through co-constructed success criteria remained an unobserved practice, Alice used questioning to evoke responses from the students through asking them when teaching the underarm throw to repeat and explain a rhyme ‘tick, tock, step and throw [swing arm forward, swing arm backwards, step into pass and throw]’ that she used to reinforced the success criteria regularly throughout her lesson (Field notes, P3, L2). While advancements in the PSTs’ assessment application were evident, the teacher educator continued to modify and refine the approach used in phases four and six. In phase six, the approach consisted of content that was specific to each individual PST, with a focus on the enactment of key components of AfL, such as self-assessment.

By phase seven, following the use of mentoring, modelling and scaffolding, Alice, Monica, Jessica and Nicola were aware of the role of the students throughout the lesson,
appreciating their involvement as key to the enactment of AfL (Black & Wiliam, 1998).

Comments such as ‘I couldn’t imagine not involving them in coming up with the success criteria (Alice, Interview P7), ‘they owned it and came up with all the points’ (Nicola, P7), ‘the girls really enjoyed coming up with the criteria for the sequence’ (Jessica, Interview, P7) highlight the need for the active involvement of the students and align with what Stiggins (2005) describes as placing the students inside of the assessment process.

Interestingly, the PSTs attributed the upskill phase four of this study, where the teacher educator employed mentoring, modelling, and scaffolding, to greater assessment application assessment comprehension in the enactment of AfL in phase five. The teacher educator noted great autonomy and student involvement in the enactment of AfL in her field notes in phase five (Stiggins 2005). Nicola reflected ‘it was like a penny dropped and I understood, I could see how I was supposed to be doing it. I didn’t get it until I saw it and then I done it with you (teacher educator) helping us’ (Interview, P5).

Facilitation of self- and peer-assessment

The use of self-assessment was not employed by any of the PSTs in phase one. Peer-assessment was used by Alice during phase one but lacked the reinforcement required to enhance student learning. Monica alluded to proposed plans for facilitating self and peer assessment but did not teach physical education again in phase one, so had no opportunities to enact such AfL strategies. All PSTs discussed the reluctance they felt in using peer-assessment. Jessica commented how she had reservations and feared that the students would not respond appropriately:

Yeah I don’t know…well not with these boys…they were a bit…rowdy at times so I don’t know how they would….they’d probably say mean things to their friends you know in peer-assessment….I would want to know them a bit better to make sure that I would pair them up with the right person I suppose’ (Jessica, Interview P1).
Although Hay and Penney (2013) emphasise that students require support to take on such new responsibilities for their learning, the dynamics between the students in Jessica’s instance impacted her reluctance to engage in peer assessment. Despite teacher educator mentoring in phase one, Jessica did not enact peer assessment in her teaching of primary physical education until phase seven. The teacher educator is conscious that her low level of assessment application of peer-assessment could be impacted by the fact that a three-week block may not provide sufficient time for PSTs to effectively introduce this strategy when they, nor the students, have any previous experience with peer assessment.

Throughout the physical education module, the PSTs were provided with opportunities to practice enacting peer-assessment with their peers, and were encouraged to highlight areas of achievement before providing explicit peer feedback on how the performance of their peers could be improved. Practicing the enactment of peer-assessment with one’s peers did not appear to prepare the PSTs adequately for the contextual factors that can prove challenging when working with students in the primary school. Wiliam (2011) advised that in order for peer-assessment to be implemented in a way that enhances student learning, students must be given optimum time to develop these skills. Similarly, time for PSTs to practice enacting peer-assessment, through scaffolded experiences in contexts outside of working with their peers during their physical education programme, may be more effective in the preparation of PST enactment of peer-assessment.

Alice demonstrated greater assessment literacy by phase seven where the learning objectives and success criteria were used to facilitate peer-assessment, with students having to identify areas of success and one area to improve on for their peers. Nicola employed self-assessment in her teaching including subjects outside of physical education in phase seven, finding it enhanced her knowledge of student learning. She explained how students ‘told me about their drawings’ and ‘as they were explaining they realised their drawings hadn’t got the
legs together in the pencil roll so they went and rubbed it out to fix the drawing’ (Interview, P7). She acknowledged how this further impacted on peer learning for other students describing ‘well when some children were explaining about their drawing you could see the others were listening as they started changing their drawings based on what was said’ (Interview, P7). This included demonstrating how, when AfL is enacted correctly, students can be both givers and receivers of feedback (Black & Wiliam, 1998) and act as resources for one another. Nicola indicated that students began correcting their self-assessment drawings of their performance of skills subsequent to discussions on the drawings. She further reflected how ‘they started asking for a new page as they were learning from listening to each other, going ‘oh eh I think I did mine wrong’ (Nicola RJ, P7).

Noteworthy in relation to the overall lack of enactment of self-assessment was the lack of opportunities to complete a college-based upskill session with the PSTs in phase six. All upskilling in phase six took place in the PST school placement context, which proved difficult as the PSTs had other school placement requirements to fulfil. An evident gap has emerged through engagement in this research with the teacher educator reflecting that greater emphasis on self-assessment during phase four and six, and overall in the delivery of the physical education module, may have led to more effective implementation of AfL by the PSTs. Acknowledging that knowledge develops over time (Hein, 1991), the teacher educator felt that insufficient access to the PSTs in phase six, and insufficient exposure to teaching physical education in phase five, impacted on the time required to model self-assessment.

**Assessment interpretation and critical engagement with data**

As alluded to earlier in this paper, all PSTs planned stand-alone lessons with little evidence of progression across the content taught in phase one. Low levels of assessment interpretation were evident in phase one. Hay and Penney (2013) emphasise that critical engagement with assessment involves the distribution of power through the enactment of assessment processes.
In phase two, advancements were observed in all of the PSTs’ assessment interpretation. Jessica, Monica, Alice and Nicola planned in a more progressive manner with observations being central to modifying the lesson learning objectives. In phase five, Monica outlined the amendments made in her assessment application when enacting AfL. Improved assessment application resulted in more focussed observations that consequently facilitated greater focus and the refinement of her planned learning objectives. Post lesson debrief discussions with Monica highlighted greater assessment comprehension for Monica that lead to greater assessment application;

They [students] found it hard to focus on the arms and legs at first, so I knew from watching them to focus my assessment on just the arms and then the second week I was like ‘ok now we’re going to focus on the legs’. It allowed me to plan and see what my learning objectives would be for the next lesson (Monica, Interview, P5)

The PSTs began to consider AfL as important for determining how to develop students’ learning and inform future teaching, indicating a change in their awareness of AfL, greater assessment interpretation and critical engagement with the assessment data. Comments by Monica, such as ‘Oh look, she has her arms stretched by her ears’, and ‘Where should her feet be? Is she doing that?’ (Monica Field notes, P5, L2), were recorded to highlight the integration of success criteria, questioning, feedback and peer-assessment that was evident in her teaching. Monica’s critical awareness had increased and a collaborative approach that enhanced teaching and learning was evident. Furthermore, Monica showed value in the dual responsibility in the provision of feedback and explained how this was facilitated by her questioning.

The PSTs began to acknowledge the enjoyment that students gained through active involvement in the assessment process. Alice and Monica described the increased levels of participation that peer-assessment facilitated where a collaborative and blended approach to the delivery of feedback was employed. Alice provided feedback that was informed by overall observations of student performances on a whole class level, and yet students received
individual feedback from their peers, which provided greater focus to levels of individual
achievement. Aligning with the teacher educator’s field notes, Alice commented ‘like they
didn’t want the lesson to end and they were so good at giving each other feedback. They kept
asking for one more throw to get it right’ (Alice Interview, P7, L2). The teacher educator
recorded Jessica’s reflections quoting her in the field notes:

when I went in and did it [teach PE] I was like yeah yeah and I wanted to teach that
next lesson then because I could see where they were at and wanted to see them pull it
into a performance. They also had ideas and wanted to share them. Like I could have
included them into the next lesson and they then would have seen that I took their
ideas on board. They’d get more involved then (Field notes, P7, L1.)

The PSTs began to see the value in enacting AfL to include the students, inform them of their
achievements and guide them towards the next stages of learning. Nicola, while initially
believing she had nothing to advance in the skill performance of one student experienced in
basketball, she began to see that her role was important for further development of his target
skill, acknowledging the positive response also received from the student. Despite the
evidence of critical engagement with the assessment data, greater opportunities presented
themselves for PSTs to engage students in reflection on enjoyment levels and the benefits of
the practices used. One possible limitation may have been that insufficient time was available
to engage the PSTs in development of this across the phases, considering the difficulties in
accessing them as a whole group due to advanced school placement commitments in phase
six.

Conclusion

This study presents individual experiences of five primary PSTs and the extent to which
they demonstrated assessment literacy in their enactment of AfL while teaching primary
physical education across four blocks of school placement.

The use of teacher educator modelling, mentoring, and scaffolding with primary
school students did have an impact on PSTs’ integration and transference of assessment
practices to the teaching of physical education. Furthermore, this lead to enhancements in
PSTs’ understanding of how to enact AfL in the teaching of primary physical education, thus
facilitating development in their assessment literacy. This study highlights the importance of
providing PSTs with opportunities to observe practices implemented in realistic contexts to
facilitate transference of these practices to their school placement. Opportunities should be
sought in relation to modelling AfL in contexts similar to school placement.

Further research that explores the most effective way in which ITE can instil
assessment literacy in PSTs would be welcomed. This could include examining the
experiences that PSTs have with assessment literacy in modules solely focused on assessment
and modules where assessment literacy is embedded across the subject-specific module
content. A related area for further research is how best to provide PSTs with the reality of
appropriately enacting assessment practices with school students, given that school
placements in Ireland occupy a relatively small proportion of ITE programmes.

The findings highlight that often PSTs are asked to engage students in practices (such
as peer assessment) that the students have never encountered. Insufficient knowledge of the
students’ abilities and dispositions resulted in some instances in PSTs introducing AfL
strategies that experienced teachers would not have supported. The reluctance by the PSTs in
the enactment of AfL, such as the fear of negative feedback in peer assessment, indicates the
importance of including greater opportunities to reflect on the complexities, rather than solely
focussing on the benefits, of employing AfL. When faced with contextual challenges, such as
insufficient exposure to teaching physical education, and relational dynamics among the
students, opportunities to develop some practices were not available or sufficient in a three-
week school placement. This implies that the time required to practice enacting peer-
assessment for both teachers and students, as recommended in the literature, was a factor that
resulted in its’ omission from PST practice. The need to develop relationships with the
students and identify context specific social dynamics among the students, was considered as
important for PSTs to effectively enact peer-assessment during school placement. This
highlights that further opportunities are required for PSTs to experience all AfL strategies
during ITE as well as extended school placements in which to explore the enactment of self-
assessment.

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