An investigation into the effects of short-course professional development on teachers' and teaching assistants' self-efficacy

Kyriaki Makopoulou[a*], Ross D. Neville[b], Nikos Ntoumanis[c], Gary Thomas[d]

[a]*School of Sport, Exercise & Rehabilitation Sciences, University of Birmingham, Birmingham, UK*

[b]*School of Public Health, Physiotherapy & Sports Science, University College Dublin, Dublin, Ireland*

[c]*School of Psychology, CurtinUniversity, Bentley, Western Australia, Australia*

[c]*School of Education, University of Birmingham, Birmingham, UK*

*Corresponding author:

Dr. Kyriaki Makopoulou

Lecturer, School of Sport, Exercise and Rehabilitation Sciences, University of Birmingham,

B152TT, UK

Tel: 0121415 8386, Email: k.makopoulou@bham.ac.uk

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Introduction

There is international recognition that improving the quality of teachers is central to improving student learning outcomes (British Council 2016, United Nations Educational, Scientific and Cultural Organisation [UNESCO] 2014). To raise standards of achievement in schools, therefore, teachers are expected to expand their knowledge and skills by engaging in Continuing Professional Development (CPD) (Department for Education [DfE] 2016, Jones and O'Brien 2014). CPD can take many forms, and it is now conceptualised broadly as any type of professional learning – from formal, day-long, short courses to informal collegial interactions or sustained Professional Learning Communities (Scheerens 2010).

Results from international surveys on the patterns of CPD participation suggest that teachers do actually pursue a wide range of CPD activities (Scheerens 2016) and that one-off courses (or workshops) feature prominently in their CPD profiles (Organisation for Economic Co-operation and Development [OECD] 2009). Because of the relatively low cost of delivery, short courses have the benefit of being accessible to a large number of participants. They provide opportunities for networking and knowledge exchange, not only with other participants, but also with external agencies and experts from whom they can develop new knowledge and insights (Lauer *et al.* 2014).

Despite their apparent practical benefits, research is equivocal on the lasting impact of CPD short courses. For example, in one of the original publications on teachers' professional development, Fullan (1991) argued that one-off, short courses represent only the front-end of the complex teacher change process. Since then, short courses have been criticised for failing to engage teachers in meaningful and impactful professional learning in a number of seminal publications (Borko 2004, Huberman and Guskey 1995, Kennedy 1998, 2016). One legitimate concern is that the content of short course CPD is too often standardised and transmitted without

due consideration of the specific contexts in which teachers work, and which largely dictate their professional learning needs (Patton *et al.* 2012). A 'deficit' approach to professional learning – which assumes that teachers' knowledge base is lacking and needs to be 'added to' or 'corrected' (Kennedy 2005) – is also considered particularly problematic (Sugrue 2015).

Whilst research has identified limitations in the ways short courses are organised and delivered, it has also been acknowledged that the quality of CPD implementation can vary significantly within and across programmes (DfE 2016, Higgins *et al.* 2016, Musset 2010, Wei *et al.* 2009). Moreover, despite a long-standing belief that short courses have limited impact on teachers' practices, recent publications (Gore *et al.* 2017) provide new evidence that 'CPD of moderate duration (one day in total) can have a considerable and lasting impact on teaching and learning' (Cordingley *et al.* 2015, p. 4). In other words, existing work suggests that it is erroneous to assume that all short courses are ineffective by default. Clearly, further research is needed to examine the *contribution* short courses can make to teachers' professional learning to inform CPD policy and the design of short course CPD programmes for maximum impact.

Study purpose

The present study sought to advance this line of inquiry by examining the impact of a national CPD Programme on participants' self-efficacy (SE) in England (herein 'the Programme'). Delivered in the form of a one-day, six-hour long course, the Programme was developed with the aim of improving the confidence and competence of school staff (teachers and other adults involved in the education of children) to deliver high quality inclusive physical education (IPE). The Programme was implemented over a three-year period (2013-2016) during which 434 courses were delivered to approximately 5500 school staff across the nine geographical regions in England. A large national faculty of tutors were involved in Programme delivery. The scale of the Programme thus offered a realistic setting within which to explore research questions about the

contribution and effectiveness of short CPD courses. The two primary research questions that underpinned the study were as follows:

1. Has participation in the Programme made a difference to teachers' efficacy beliefs regarding effective IPE?

2. What individual, contextual, and course-specific factors moderate CPD impact in the context of this Programme?

After consultation with Programme designers, it was decided that SE was the most valid construct for capturing Programme impact within the available resources and in recognition of research identifying positive links between teacher SE and teaching quality more broadly (OECD 2009, Zee and Koomen 2016) and differentiated instruction more specifically (Chao *et al.* 2017; de Neve *et al.* 2015). In the context of the present study, SE is defined as the degree of participants' confidence in their ability to organise and execute specific teaching task/s successfully (Depaepe and Konig 2018). A quantitative approach was adopted with the aim to collect evidence at different points in time (i.e., before and after) in order to understand the scale of the Programme's impact and the factors that moderated that impact. The conceptual framework developed for this purpose is explained in the following section, followed by a detailed account of the methodological approach adopted.

Conceptual framework: theoretical and empirical grounds

The research expectation underlying the present study was that course attendance would *contribute* to an increase in CPD participants' self-efficacy (SE) over time. It was therefore important to capture change in SE over time, and to account for any factors that might influence any observed change. To achieve this, an evidence-based conceptual framework, capturing a range of factors, was developed.

The framework was adapted from Ingvarson *et al.* (2005, p. 6) and incorporated three types of variables that research suggests are linked to CPD: individual, contextual and Programme-specific factors (Day and Gu 2007, Opfer and Pedder 2011) (see Figure 1). Specifically, whilst the quality of the CPD experience itself is a significant factor determining CPD effectiveness (Desimore 2009), research suggests that there are a number of individual and contextual factors that moderate, or interact to influence, professional learning and change (Opfer *et al.* 2011). In order to estimate CPD impact in this context, these 'moderating' factors needed to be taken into account. The composition of these individual, contextual, and Programme-specific factors are elaborated in further detail in the following subsections.

[INSERT FIGURE 1 HERE]

Individual factors

To account for heterogeneity in the ways in which participants engaged with the CPD (OECD 2007), five individual factors were included in the conceptual framework as potential moderators of Programme impact (as shown in figure 1).

Age and gender. Research evidence on the extent to which age or gender influences CPD participation and impact is mixed (Rutkowski *et al.* 2013, Gore *et al.* 2017). For example, there is some large-scale evidence that male and female teachers have similar patterns of CPD *participation* (OECD 2009). However, in a recent study (Gore *et al.* 2017), it was reported that the CPD programme evaluated had a greater *impact* on female teachers compared to male. Given the fact that our research focus was estimating CPD *impact*, and not simply observing patterns of CPD *participation*, it was decided that comparisons based on participants' demographic characteristics could offer useful insights on the relative effectiveness of the Programme and contribute to the relevant literature.

Experience (in years). There is some evidence that teachers at different career stages differ in their SE, pedagogical orientation and skills, attitudes to pedagogical change and CPD goals (Coldwell 2017; Louws *et al.* 2017, Maskit 2011). Some studies suggest that engagement in CPD peaks in the middle of the careers (Richter *et al.* 2011) whilst others do not find any differences in patterns of CPD engagement between beginning and experienced teachers especially when informal professional learning is concerned (Grosemans *et al.* 2015, Kyndt *et al.* 2016). Given this uncertainty of the existing knowledge base and the diverse cohort of school staff involved in the present study, it was important to examine the moderating effect of years of experience on CPD impact.

Sectoral differences. Recent studies (Murphy and de Paor 2017) have identified sectoral differences in terms of what teachers want and need to learn. This is particularly relevant in the English context where primary physical education (PE) is taught by generalist teachers, whilst in secondary schools PE specialists are employed. Existing research suggests that primary school teachers have very limited opportunities to learn how to teach PE in initial teacher education (Morgan and Bourke 2008). Perhaps as a result, they report lacking the confidence and subject knowledge to design and deliver high-quality PE (Harris *et al.* 2012). A recent report by school inspectors in England (OFSTED 2015) raised concerns about PE delivery in primary schools. This suggests that participation in CPD about PE might have different impact on primary and secondary school staff because of differences in their prior knowledge, experience and confidence. This factor was therefore included in the conceptual framework as a potential moderator.

Roles and responsibilities. Research also indicates that teachers and other school support staff (such as teaching assistants in the English context) have different CPD needs and are differentially prepared to facilitate inclusive education (Maher and Macbeth 2014, Vickerman and Blundell, 2012). Given this evidence – and given the fact that the Programme was open for all

school staff not just teachers – it was decided to examine the relative effect of the course on school staff with different responsibilities (teachers and teaching assistants).

Baseline self-efficacy (SE). There is a large body of research which supports the notion that SE is a key determinant of effective teaching (OECD 2009) and a key motivation belief influencing teachers' professional beliefs and actions (behaviours) (Durksen *et al.* 2017). This includes their 'effort, aspiration, planning, organisation, persistence and resilience' (Chao *et al.* 2017) as well as the extent to which they differentiate instruction (Dixon *et al.* 2014). Teachers' SE is also believed to be a variable in explaining professional learning participation and impact (Caena 2011). This means that there is an assumption that teachers with higher levels of efficacy seek – and engage in – more CPD opportunities. There is however very limited research on the effects of baseline SE on CPD participants' ability to develop new insights (i.e., learn), use new knowledge into existing practice (review or renew what they already do), or provide richer learning experiences to their pupils. In other words, it is still unclear whether more efficacious teachers engage with the CPD experience in different – and potentially more effective – ways than less efficacious teachers. Given the anticipated variability in course participants' starting points, it was paramount to measure and control their baseline SE.

Contextual factors

Contextual factors relate to participants' perceptions about the ethos and values of their school in relation to inclusion and professional learning culture. These were included in the framework as there is an established body of research demonstrating that specific institutional characteristics can have a significant (positive or negative) impact upon school staff's ability to learn and change (Bolam *et al.* 2005, Maughan *et al.* 2012). These features include the level of administrative support, the school ethos and culture about professional learning and collaboration, and the available physical space or resources. Embedded in these publications is an understanding that

when teachers work in schools that foster collaboration, they have enhanced opportunities for sustained, *in situ*, professional learning (Caena 2011). This leads to teachers feeling less isolated and experiencing a greater sense of confidence and job satisfaction (Markow *et al.* 2013). CPD in this context is understood as being a complex process which is contextually situated (Opfer *et al.* 2011) rather than a single event that can 'cause' or lead to positive changes irrespective of the context in which it is meant to be applied.

Programme-specific factors

Programme-specific factors focus on the nature and quality of course implementation. Contemporary theories of learning (e.g. constructivism, situated learning) provide useful insights on how to design and facilitate high quality professional learning experiences (Desimore 2009). It is widely believed that professional learning is more likely to occur when teachers have opportunities to engage actively in the learning process, work with and learn from other teachers, build upon, evaluate (scrutinise) existing practices, and make connections between new with existing understandings (Higgins *et al.* 2016).

In this context, researchers have started unpacking the 'pedagogy of facilitation' (Poekert 2011), and results suggest that effective facilitation involves tutors: (i) offering participants opportunities to explore alternative modes of teaching in meaningful contexts (Kennedy 2016); (ii) fostering conversations that are both affirmative and contradictory in order to introduce 'disequilibrium' (Patton *et al.* 2012, p. 530); and (iii) achieving an appropriate balance between theory and practice so that pedagogical innovation is promoted within a theoretical framework rather than in a vacuum. Meaningful engagement and learning can also be achieved by ensuring that learning activities are rooted in evidence of what and how participants do (Boud and Hager 2012) so that existing beliefs and practices are shared, articulated, discussed, reflected upon, compared to the new professional learning, and – when required – problematized and reviewed

(Timplerley *et al.* 2007). In the context of the present evaluation, it was therefore important to include the nature and quality of the professional learning experiences afforded to participants during the IPE courses as another potential moderator of Programme impact.

Methodology

The IPE Programme

The IPE Programme, funded by [insert funder here] and managed by [insert major partner here] , was rolled out in 2013. The 'inclusion spectrum', developed by Black and Stevenson (Stevenson 2009) in the UK, provided the 'theory of instruction' (Wayne *et al.* 2008) for the Programme. The main principle of the Inclusion Spectrum is that all students can be included and challenged to progress in their learning when teachers design the learning environment by including 'open' (all learners participate in activities that do not emphasise individual differences), 'modified' (provide differentiated instruction using the STEP tool) 'parallel' (ability groups) or 'separate' (temporary interventions aligned with the learning objectives of the lesson) activities – or through a process called 'reverse integration' where all pupils participate in disability sport (Stevenson 2009).

The content and structure of the courses were designed and reviewed centrally by experts on inclusion. The delivery was the responsibility of approximately 30 tutors consisting mainly of PE teachers working in secondary or special schools with tutoring experience, or independent consultants. Although variability in course implementation was anticipated, detailed couse material were produced and disseminated to ensure that the key deliverables were achieved across different contexts. Tutors were also invited to participate in 'tutor development days' approximately twice a year, during which course material was presented, explained and debated, practical sessions to illustrate examples of effective course implementation were included, and issues of concern were discussed.

Contemporary approaches to delivery, reflecting participant-centred CPD (Patton et al., 2012), appeared to underpin the philosophy of the Programme in different ways. For example, tutors were expected to facilitate discussions about theoretical and practical issues, provide hands-on and innovative practical activities to apply the inclusion spectrum into practice, support participants to develop effective inclusive pedagogies by having opportunities to 'design and modify' activities in practical settings, foster sharing of expertise, and engage participants in 'action planning' through reflection.

Research Design and Ethics

A repeated measures design was adopted to examine the contribution of the Programme to participants' self-efficacy (SE). Data were collected from the same population of participants at three points in time: Time 1 (T1) – at the start of the course to obtain baseline information; Time 2 (T2) – at the end of the six-hour course to examine immediate changes occurring as a result of participation; and Time 3 (T3) – three to six months following course participation to ascertain the longer term impact of the Programme. The timing of data collection was based on previous CPD research, which indicates that a minimum period of three months is necessary in order to provide participants with a basis upon which to gauge CPD impact (Ingvarson *et al.* 2005). Evidence obtained at T3 was perceived to be the most important impact data as research suggests that the effects of CPD programmes should be evaluated on the basis of whether these effects are maintained over time (Gaikhorst *et al.* 2017).

Full ethical approval was obtained by the Ethics Committee of the [add name of Institution here]. Participants were given a detailed letter explaining the nature and purpose of their participation and advised that each time they completed any inventory, they gave their informed consent to participate in the study. All participants also were given the opportunity to withdraw

from the study at reasonable intervals by contacting the main investigator of the study (first author).

Participants

A total of 5,500 partcipants were trained during the Programme, of which 1604 attendees were eligible for inclusion in the present study. This is because they were male and female teachers or teaching assistants, who worked in either primary or secondary schools – the population for whom the Programme was initially developed. Of these 1604, 1533 (T1), 1432 (T2) and 149 (T3) participants produced responses that were completed to the point of being eligible for inclusion in the analysis. The overall proportion of completers at T1 and T2 is, therefore, 96% and 85%, respectively. The proportion of completers is clearly smaller at T3 – 9%. Despite this attrition, it was still possible to examine the *relative* impact of the Programme across a sample that can be considered large for a repeated measures design (de Vaus, 2001). Furthermore, an analysis of completers (T3) vs. dropouts (T1 and T2) outlined in Table 1 shows that these two groups did not differ substantially on any of the subject characteristics of interest.

Whilst we would be cautious in stating that completers are T3 are representative of all participants who were eligible for inclusion at T1 and T2, this analysis of completers vs. dropouts does indicate that they provide a useful subsample from which we can derive practical conclusions. A full breakdown of subject characteristics of interest for completers is presented in Table 2.

Key outcome measure – SE inventory

Consultation with Programme designers and funders confirmed that self-efficacy (SE) was the most valid construct for capturing Programme impact. A bespoke, ten-item, inclusive PE practice SE inventory was developed for the purposes of this study by drawing upon existing validated

instruments (Block *et al.* 2013; Humphries *et al.* 2012). The development of a Programme-specific inventory was important in order to reflect the specific setting within which SE was being evaluated (Wayne *et al.* 2008). The inventory was developed through an iterative process between the research team and Programme designers. Initial items were derived from observation of two separate courses. These items were reviewed by Programme designers to ensure clarity and alignment with Programme expectations and subsequently piloted during four additional courses. The final inventory (Table 3) included statements about teaching task differentiation, pupil assessment and and pupil's independent learning.

A 7-point Likert scale ranging from 1 (*not at all confident*) to 7 (*completely confident*) was employed. T1 and T2 were administered as paper-and-pencil questionnaires which were distributed to participants by the course tutors on the day. T3 was administered by the researchers using an online survey. Principal Components Analysis (PCA) confirmed a single-component solution for the inventory. This component had an eigenvalue of 6.5, in comparison to the nine other possible components which had eigenvalues of <0.7. Alpha reliability for the inventory was acceptable, at 0.92, 0.92 and 0.91 at T1, T2 and T3, respectively.

Individual moderators – demographic inventory

To operationalise the conceptual framework (Figure 1), a demographic inventory was developed to capture individual factors (i.e., gender, age, years of experience, role) that are expected to moderate Programme impact based on previous research (Vaz *et al.* 2015). Participants completed this scale at T1. Gender and role were treated as categorical variables, and age was treated as continuous. Years experience (YE) groups were derived manually following a similar process to that outlined in Harris and Sass (2011), and were categorised into three groups representing high (>15), medium (5–15) and low (<5) levels of working experience.

Contextual moderators – 'about your school' inventory

To capture participants' perceptions about the setting in which they worked, a 13-item 'About Your School' inventory was developed drawing upon the *Index of Inclusion* (Booth and Ainscow 2002) and the broader literature on schools as learning organisations (Kools and Stoll 2016). The final inventory (Table 4), distributed at T1, captured participants' perceptions about the level of collegiality within their school and the opportunities which existed for cascading knowledge. Items related to the culture, ethos and available resources within school vis-à-vis inclusion, and the quality of inclusive physical education were also included. A 7-point Likert scale ranging from 1 (*not at all in agreement*) to 7 (*completely in agreement*) was employed. PCA confirmed a single-component solution (eigenvalue=5.0; other components, eigenvalue≤1.2), and alpha reliability was deemed acceptable, at 0.85.

Programme-specific moderators – 'opportunities to learn' inventory

Perceptions about Programme quality were elicited immediately following course participation (T2) with a 13-item 'Opportunities To Learn' inventory (Table 5), developed by building upon the *Quality of Professional Learning Index* (Ingvarson *et al.* 2003). Participants were asked about the extent to which they had opportunities to participate in activities that the CPD literature identified as critical to increasing teacher knowledge and skills (Desimore 2009); and the extent to which they intended to act on new knowledge. A 7-point Likert scale ranging from 1 (*not at all in agreement*) to 7 (*completely in agreement*) was employed. PCA confirmed a single component solution (eigenvalue=6.0; other components, eigenvalue ≤1.1) and alpha reliability was deemed acceptable at 0.92.

Statistical analysis

Data were analysed using linear mixed models (Proc Mixed) in the Statistical Analysis System (SAS Studio). Mixed modelling was adopted to account for the unequal variances that were present in the comparison groups, as well as the possibility of positive, negative, or even non-responders to the Programme. For the analysis of the main effects the Programme on participants' SE (T3 minus T1), differences were analysed between four groups based on the interaction of sex and school role: female assistants, female teachers, male assistants, and male teachers. For the analysis of additional moderators, the estimates were derived by sex but independently of school role. This resulted in estimates of effect for males and females across three *levels* for each of the four additional moderators (age, years experience, perceptions about inclusion and perceptions about course quality). Levels for age and years experience were as follows: Age, Group 1 <25, Group 2 =25-45, Group 3 >45; Years Experience, Group 1 <5, Group 2 = 5-15, Group 3 = >15. Levels for 'perceptions about inclusion back at school', and 'perceptions about workshop quality' were low, medium, and high groups. Cutoffs for group levels were set at ±1SD above and below the mean.

A Bayesian approach to estimation known as magnitude-based inferencing (MBI) was used to evaluate the effects (Batterham and Hopkins 2015). Uncertainty was expressed as 90% confidence limits (CL) and the magnitudes were evaluated against a smallest worthwhile threshold of ±0.5 units of the measure. It was reasoned that a half a unit change of the measure represented an appropriate smallest unit of change – an approximate 10% step-change along or difference between groups on the six-step Likert scale. The size of the effects was evaluated using the following scale: <0.5, trivial; 0.5-1.5, small; 1.5-3.0, moderate; 3.0-4.5, large; >4.5, very large (Hopkins *et al.* 2009). Magnitudes are interpreted based on the upper and lower confidence limits and are presented as qualitative probabilistic inferences derived from the following scale: <0.5%, *most unlikely*, 0.5-5%, *very unlikely*; 5-25%, *unlikely*; 25-75%, *possibly*; 75-95%, *likely*; 95-

99.5%, *very likely*; >99.5%, *most likely* (Hopkins *et al.* 2009). Inferences about Programme impact were deemed clear when the chances of benefit ($\uparrow$ SE) and harm ($\downarrow$ SE) was possible and most unlikely, respectively.Inferences for comparisons between groups were deemed clear when the chance of a positive and negative magnitude was possible and very unlikely, respectively.

Results

Baseline characteristics and main effects of the Programme

Subject characteristics at baseline (T1) and immediately after attending the Programmee (T2) are shown in Table 2. Participants began the Programme with a moderate sense of self-efficacy (T1 SE), and they were positive about the quality of the workshop they attended (T2). There were some small and moderate differences between groups for other subject characteristics of interest – for example, female participants were older and more experienced than males. However, on the whole, differences between groups were trivial and are, therefore, not shown.

Changes in the dependent were assessed immediately following Programme attendance (T2-T1 SE) and at follow-up (T3-T1). Whilst participants' SE increased when measured immediately after the attending the Programme (T2) (0.8, ±0.1: *most likely substantial*; standardised effect, ±90% confidence limits: *magnitude based inference*), this increased SE was not fully sustained over time when measured 3 – 6 months later (T3) (0.4, ±0.2: *likely trivial*).

Analysis of additional moderators

Baseline SE was a clear moderator of Programme impact. Results indicate that: (i) participants entering the Programme with an above average sense of SE (mean +1SD) experienced a trivial decrease in SE (-0.2, ±0.1: *most likely trivial*); whereas (ii) participants entering the Programme with below average sense of SE (mean -1SD) experienced a possible small increase (1.1, ±0.1: *possibly substantial*). These outcomes suggests that participants with a below average sense of SE

at baseline stood to benefit more from attending the Programme (1.3, ±0.2: *most likely substantial*). The effect of gender and role on these baseline SE outcomes were trivial for all comparisons and are therefore not shown.

Age was a clear moderator of Programme impact. Females aged >45 experienced a small increase in SE at T3 (0.6, ±0.3: *most likely substantial*), whereas outcomes for younger females (i.e., all other females aged <45 grouped together) were most likely trivial (0.3, ±0.1: *most likely trivial*). The opposite case was found for males. Males <25 were more likely to benefit from the Programme than females of the same age (0.6, ±0.5: *very likely substantial*); whereas it is possible that females aged >45 were more likely to benefit from the Programme that males of the same age (0.9, ±1.0: *possibly substantial*). Whilst outcomes for males >45 were trivial-sized (-0.3, ±1.0), there is some indication based on comparisons with the other groups (0.9, ±1.0: *likely substantial*) that they experienced a possible small reduction in efficacy beliefs as a result of attending the Programme.

Years experiece was a clear moderator of Programme impact. Programme attendance was associated with increased SE for participants in the middle of their career (0.7, ±0.2: *likely substantial*) (those with 5-15 years experience). Differences between males and females were trivial for all comparisons. Perceptions about inclusion back at school was a possible moderator of Programme impact for males only. Males working at highly inclusive schools stood to benefit more from attending the Programme than males who worked at schools lacking inclusivity (0.5, ±0.6: *possibly substantial*). Differences between females working at schools either lacking, having moderate or having high levels of inclusivity were trivial for all comparisons.

Course quality perceptions were clear moderators of Programme impact. Participants who perceived courses as either of moderate or high quality stood to benefit more than participants attending courses perceived as lacking quality (0.6, ±0.2: *most likely substantial*). In other words,

the impact of the Programme was trivial for participants who perceived the course they attended as lacking quality (0.1, ±0.1: *very likely trivial*). There was a possible gender dimension to the moderating effect of course quality. Attending both moderate and high quality workshops was associated with increased SE in males (0.9, ±0.2: *very likely substantial*). However, only females attending high quality workshops experienced substantial increases in SE (0.6, ±0.2: *most likely substantial*).

Discussion

The present study investigated the effects of a short, day-long, CPD course on participants' self-efficacy (SE). Results indicate that participants experienced a substantial increase in SE immediately following the course. However, this increased SE was not fully sustained by all participants over time (3-6 months following attendance). The *overall* effect of the Programme was thus trivial. This main finding confirms some of the arguments about the limited and unsustainable impact of short courses.

When examining the moderating effect of various factors on the impact of the Programme, however, it became clear that some participants benefitted more than others, and this was particularly the case for: participants initiating the Programme with a below average sense of SE; females >45 or males <5; those who were in the middle of their careers; and participants who perceived the specific CPD course they attended as of high quality. The finding that *some but not all* participants experienced a positive impact on their SE therefore verifies the claims that CPD effectiveness is dependent on a range of individual and programme specific factors (Day & Gu, 2007; Opfer & Pedder, 2011).

The moderating effect of baseline SE was a very clear outcome. Participants with a below average sense of SE prior to initiating the course experienced a small and sustained increase in their SE over time. This is in comparison to participants with an above average sense of SE, for

whom the outcomes of the Programme were most likely trivial. It could be argued that participants with a below average sense of SE were always going to benefit more – because there is greater scope for new learning and growth. However, this provides further evidence for the need to not only target short course participation (so those who need it most pursue the most relevant course) but also ensure that its implementation is not fixed / standardised but rather tailored to the specific needs of those attending it.

Results concerning the moderating effect of gender- and age-related factors were clear, albeit mixed, which is broadly in line with previous studies (Rutkowski *et al.* 2013, Gore *et al.* 2017). Our analyses indicated that there is a substantial interaction effect between these two variables, however, which shows that (in this context at least) age and gender are not independent moderators of CPD impact. Results also indicate that school staff with 5-15 years of experience benefitted most by attending the Programme. This is in comparison with school staff with <5 and >15 years of experience, for whom Programme attendance was associated with trivial effects. Both these findings again verify that more needs to be done to ensure that all participants have the opportunity to benefit from short course attendance, despite their individual characteristics and prior experiences.

The quality of the Programme, as perceived by participants, was a clear moderator of impact. More specifically, participants who benefitted most from attending the Programme were those who evaluated the quality of course implementation most positively. Participants who perceived the Programme negatively (or even neutrally) did not experience any long term benefits in their SE. These findings are in line with previous research, which indicates that when teachers value the CPD activity they have engaged in, they are more likely to report higher SE gains and to demonstrate greater commitment to change their practices (Rutherford *et al.* 2017). The present study provides further empirical evidence of the association between CPD *quality perceptions* and

impact in the context of a national Programme, implemented by a large number of tutors on a specific subject area (i.e., Inclusive Physical Education).

Practical implications

The main practical implication of this study is that CPD providers should resist the temptation to design activities for a 'generic' participant. Instead, a pragmatic attitude is required, which recognises the value of CPD as something personal, tailor-made, for each individual professional. To tailor provision to the individual in the context of this Programme, however, a significant shift would be required in the ways tutors structured the learning environment during short-course CPD (Author, 2018). Tailoring provision requires the ability to adapt, rather than standardise, CPD content; and for tutors to see their main responsbility as one of facilitating learning rather than simply transmitting pre-determined content (Patton and Parker 2014, Poekert 2011).

There is international recognition that to be effective facilitators, CPD providers need ongoing, high quality training in order to develop the conceptual and practical tools to do so effectively (Author, 2018; Patton & Parker, 2014). This proposition raises a number of questions that can be addressed with further research. For instance, how can tutors be best supported to develop and implement the skills of learning facilitation in the context of short courses effectively? What do tutor needs to learn to demonstrate such pedagogical flexibility and what other features are associated with great tutoring? Understanding current tutoring practices, preference and pedagogies, whilst also providing evidence-based recommendations to inform the education of CPD providers, is therefore an important immediate avenue for future CPD researcher which can inform policy and practice.

Limitations and future research

There are some limitations worth considering. The reliance on self-report is noteworthy. Similarly so, the fact that the study did not assess impact in the context of pupil outcomes. Future research should strive to combine self-report data with objective measures to provide more robust evidence of the impact of CPD on teacher *and* pupil outcomes. Following Kennedy (2016), we suggest using both *specific* (tailored instruments developed to capture unique programme effects) and *general* (standardised tests) measures of pupil achievement where possible. In relation to the conceptual framework, future research will benefit from incorporating additional factors into the model. For example, we expect that the moderating effects of age, gender and years experience can be be further elucidated by adjusting for differences in beliefs systems and preferences for the perceived motivational climate underpinning short-course CPD (Durksen *et al.* 2017).

Final thought

There is consensus that teacher CPD is generally not meeting the needs of teachers in many countries (Kennedy, 2016). The present study sought to evaluate the effects of a short, day long course on participants' SE in relation to Inclusive Physical Education (IPE). Results reported in this paper confirm existing research that short courses have the potential to be effective but this depends on the extent to which participants perceive the CPD experience itself of high quality. The fact that some course participants benefitted more than others underlines the need for personalised and tailored approaches to teacher CPD so that learning is maximised for all involved.

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Table 1.

Simple statistics for dependent and potential moderator of completers and dropouts at baseline, and magnitude-based inferences for the difference in means and proportions.

	Completers Mean[a] ± SD (n=149)	Dropouts Mean[a] ± SD (n=1455)	(Completers – Dropouts)	
			Difference[a], 90%CL	Inference[b, c, d, e]
Females[b] (%)	78	73	4.6, ±6.3	trivial**
Teacher[b] (%)	65	67	1.8, ±0.6	trivial***
Age[c] (y)	34 ± 10	36 ± 11	1.6, ±1.5	trivial****
Years experience[c] (y)	7.8 ± 7.0	8.5 ± 7.6	0.7, ±1.1	trivial****
Self-efficacy[d] at T1 (1 to 7)	5.3 ± 0.9	5.3 ± 0.9	0.1, ±0.1	trivial****
Self-efficacy[d] at T2 (1 to 7)	6.2 ± 0.6	6.1 ± 0.6	0.1, ±0.1	trivial****
Inclusion at School (1 to 7)	5.7 ± 0.8	5.7 ± 0.8	0.0, ±0.1	trivial****
Workshop Quality (1 to 7)	6.4 ± 0.6	6.3 ± 0.7	0.1, ±0.1	trivial****

[a]Data are means and proportions.

[b]Magnitude thresholds for proportions: <10%, trivial; 10-30%, small; 30-50%, moderate; >50%, large (Hopkins, 2010).

[c]Inferences for continuous variables were derived by means of standardisation (differences divided by between-groups SD). Magnitude thresholds: <0.2, trivial; 0.2-0.6, small; 0.6-1.2, moderate; >1.2, large.

[d]Magnitude thresholds for Likert scale variables: <0.5, trivial; 0.5-1.5, small; 1.5-3.0, moderate; >3.0, large.

[e]Asterisks indicate effects clear at the 90% level and likelihood that the true effect is substantial, as follows: *possible, **likely, ***very likely, ****most likely (Hopkins et al., 2009).

Table 2.

Subject characteristics for completers by sex and role at baseline (T1) and post-workshop (T2)

	Female Assistant	Female Teacher	Male Assistant	Male Teacher
	Mean[a] ± SD	Mean[a] ± SD	Mean[a] ± SD	Mean[a] ± SD
	(n=416)	(n=780)	(n=111)	(n=297)
Self-efficacy at T1 (1 to 7)	5.3 ± 1.0	5.2 ± 0.8	5.3 ± 1.1	5.5 ± 0.8
Age at T1 (y)	41 ± 11	34 ± 10	30 ± 12	32 ± 9
Experience at T1 (y)	9 ± 7	8 ± 8	5 ± 5	7 ± 7
School inclusion at T1 (1 − 7)	5.9 ± 0.8	5.7 ± 0.8	5.7 ± 0.8	5.6 ± 0.7
Workshop quality at T2 (1 − 7)	6.4 ± 0.7	6.3 ± 0.7	6.1 ± 0.8	6.1 ± 0.7

[a]Data are raw means and standard deviations.

Table 3.

SE inventory

How confident are you in your ability to:
Teaching task differentiation
Change a task if it is too easy so that a highly skilled student is challenged
Change a task to make it easier for a student who is having trouble achieving in this task
Give different tasks to different groups of learners (at the same time) to meet their diverse needs
Modify the space an activity is carried out to vary the challenge for different learners
Adapt equipment to support all students, including SEND students, to learn
Design competitive experiences that are inclusive of young people of all abilities
Assessment
Support all students, including Special Educational Needs and Disabilities (SEND) students understand where they are in their learning, where they need to go next and how to get there
Assess students' learning and use this information to further their learning
Pupil independent learning
Provide opportunities to all students, including SEND students, to be independent learners
Support all students (inc. SEND), who experience difficulties in carrying out a task, think about finding solutions themselves

Table 4.

'About your school' inventory

In your school:
Iterms related to level of collegiality
There is a strong collaborative culture and I often share good practice with colleagues
Teachers and support staff collaborate to improve existing inclusion practices
Item related to opportunities for cascade
There are opportunities to cascade knowledge to colleagues after CPD attendance
Items related to the culture, ethos and available resources vis-à-vis *inclusion*
Inclusion is a high priority for all (staff, governors, students, and parents/carers)
There are high expectations for all students, including SEND students
The school makes its buildings physically accessible to all people
Adequate equipment is available to cater for those with disabilities
Support staff are available for in-class support when required
Students 'at risk' are carefully monitored and steps are taken to ensure their presence, participation and achievement
Iterms related to the quality of inclusive physical education provision
The PE curriculum is developed taking into consideration the different abilities and needs of all students
The students in my class, including SEND students, have access to high quality PE
All students in my class, including SEND students, learn together regardless of their (dis)abilities
SEND students access a range of extra-curriculum PE activities

Table 5.

'Opportunities to learn' inventory

About the course experience:
I had opportunities to question existing perceptions about inclusion
I had opportunities to put ideas forward about effective inclusive teaching and learning
I had opportunities to share knowledge, experiences and ideas with other participants and the tutor/s
A good balance between theory and practice was achieved
The content of the workshop was 'innovative'; i.e., new ways to include all students in PE lessons were demonstrated and explained
The workshop was tailored to my needs – it answered my pressing questions about inclusion
The inclusion strategies identified are feasible
I intend to implement the new inclusion strategies in my PE lessons
I intend to engage with the online resources in order to expand/deepen my knowledge
I intend to cascade new knowledge to my school colleagues
I will recommend this workshop to colleagues
Overall, the workshop was worth the time away from my pupils