A practitioner's guide for outstanding cross curricular physical education teaching:

integration of technological devices

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The national curriculum as defined by the Department of Education (2013) should prepare pupils

at school for the opportunities, responsibilities and experiences of later life. The Active People

survey has recently reported 15.83 million people aged 16 years or over (36.1%) played sport for

at least 30 minutes at moderate intensity at least once a week from 2015 - 2016 (Sport England

2016). This statistic highlights that key principles in which everyone leaving education is

intended to learn are not being applied in reality. With reports finding 58% of women and 65%

of men being overweight or obese there is an abundance of support for this notion that learning is

not taking place (HSCIC 2016). The impact of physical education on the future generation is

becoming increasingly important with the results being evermore apparent.

Physical education incorporates opportunities for students to develop personal fitness and

promotes an active, healthy lifestyle. As physical educators we have seen the importance of

optimising devices such smart phones and tablets. These gadgets are becoming everyday tools

for the majority of the population (Kellems et al. 2015). Teachers are immersed in a dialect with

consistently used phrases such as: fifa, fitbit, i-pad, twitter, android, snapchat, instagram,

whatsapp. As these technologies have evolved so has the ability to continually and actively

engage students outside of the classroom (Thiele et al. 2014). Integrating technology into the

subject is not a matter of good practice and teaching but is essential for the survival and

legitimacy of the subject. As Jacobs (1989) proposed, this concept of mixing subjects is called

cross-curricular integration. Effective initial teacher training involves

infusing technology throughout the teacher preparation process (Roth 2014). This is increasingly

24 important considering this is part of the statuary requirements for newly qualified teachers (DFE

25 2012). Randall and Cale (2014) support this with the development of their learning map for

26 mentoring secondary physical education teachers. This map, which can be found on the AfPE

27 website reinforces the concept that teachers should use technology and social media to support

28 teaching and learning in physical education. This is a reciprocal process; the teacher is

29 implementing strategies to support the students but also to inform their own professional

30 development.

31 The Office for Standards in Education, Children's Services and Skills (2010) promote cross-

32 curricular integration, they refer to this concept as 'creativity in teaching'. They suggest creative

33 teaching should be supported with well-organised cross-curricular links that allow scope for

34 independent enquiry whilst also being accessible and relevant to all pupils. They draw attention

35 to the fact that not all teachers are exploring or demonstrating technical competence to promote

36 creative and independent work. This article sets out to promote the active use of technology for

37 physical education teachers within lessons.

38 Technology such as heart rate monitors, smart phones, tablets, QR codes, flip cams and

39 pedometers are known by many physical education teachers. Table 1 includes a variety of

40 strategies that we have collected for integrating technology in different units of physical

41 education. While this list is not exhaustive it does provide examples to illustrate strategies related

42 to cross-curricular integration. Within physical education lessons technology can assist all

43 students in many pupil centered activities but specifically those students with a disability

44 (Kellems et al. 2015). Further, this is a beneficial differentiation tool. As Clapham et al. (2015)

45 have found heart rate monitors and pedometers are tools to individualise instruction to meet

46 students' needs as activities are focused on personal time spent in their target heart rate zone and

47 how many steps they are accumulating during a lesson. By using these devices, students may feel

48 motivated to be physically active because they receive instant feedback about their level and

49 amount of physical activity during class. Furthermore, students are more accountable when using

50 these devices. They also allow the teacher to differentiate in both task and outcome.

51 A formative assessment strategy recommended by the Department for Education (2013) is

52 student evaluation. By allowing students to analyse their performances compared to previous

53 ones and demonstrate an improvement value is added to what is learnt. Teachers can enhance the

54 physical education curriculum by allowing students to use flip cams, tablets or personal smart

55 phones to record their own performances and self/peer evaluate.

56 Admittedly if one has never used some of these strategies it can be an overwhelming task; there

57 is a hesitance by some teachers and faculty members to change learning environments to

58 something alien (Rosenthal and Eliason 2015). However the pressure on physical education

59 teachers to integrate technology may increase as the digitally native students will begin to

60 demand the same technologies that stimulate them in their daily routines (Kretschmann 2015).

61 As a suggestion we promote one strategy at a time to be imbedded within ones lesson plan.

62 Become comfortable with the use of pedometers for example in a games lesson then move

63 forward with another technological device. Try not to view technology as something new or

64 foreign, think about what you use to help you in your continued professional development and

65 move on from there. Consider using statistics gathered from pedometers to attain numeracy and

66 literacy integration within physical education. Furthermore, collaborate with the information

67 technology department to share resources and ideas as well as promoting the use of personal

68 devices to save on those ever so stretching physical education budgets. Also liaise with child

69 protection officers to ensure you are adhering to your schools policies and protocols. Through

70   using cross-curricular integration we have a unique opportunity in physical education to provide

71   high quality lessons with relative ease for our students, physical education is our gateway. Good

72   luck!

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Types of Technology	Flip cams IPAD Smart Phones Fit bit – GPS watches/ I-Watches HR monitors Computer programs including Dartfish, SportCoach, Youtube, Coach's Eye Speed gaits High Cams Nintendo Wii strategy for non-doers with programmes such as Wii Fit, Wii Olympics X-Box
<u>Content Area</u>	ICT – Mobile Technology
Athletics National Curriculum Link: 'evaluate their performances compared to previous ones and demonstrate improvement'	• Analysing peer performance (**IPAD**): Using simple functions such as video record and apps such as **Coach's Eye** students can watch and re-watch their peer's performance. Students can then either use a pre-recorded "perfect example" or video the teacher at the start of the lesson demonstrating. Then compare and contrast performances. *A **video** of a "perfect example" could be given as an out of lesson warm up task to prepare the pupils for the lesson.* • Students could create a '**snapchat'** story of their progress throughout the lesson as a form of assessment. • Through mini-plenaries: ask students "**tweet**" questions they have in regards to developing their technique. Encourage pupils to screen shot elements of the video and tweet them seeking advice from other students or resources.
Basketball and volleyball National Curriculum Link 'use and develop a variety of tactics and strategies to overcome opponents in team and individual games'	• Tactical development: pose a tactical question in an **online forum** before the lesson for example; what would you do in a full court press? • Bring the subsequent conversation into the lesson and play out the scenarios discussed. *Example: Look at how the Lakers defend the New York Giants from a **youtube video***. • Was it successful? • How can we apply their defending principles in our team? • What techniques do they use for stealing the ball?
Dance and Gymnastics National Curriculum Link 'develop their technique and improve their performance'	• Create a music video (**Flip Cam**): After pupils choreograph a dance can use a flip cam to review and refine their work. The Flip cam should be used to develop their technique and to record a final version of the dance/gymnastic routine. Instead of a live performance pupils could make a music video or using the **app 'video star'**. • *Present and showcase the work the same way an Art Exhibitions does (Links to media).*
Sustained Running	• Assessment: Utilize the fitness apps that are embedded in the 21st

National Curriculum Links	Century. Pupils to use "**Map my Run**" or "**Nike Running App**" to track and monitor their progress.
'Continue to take part regularly in competitive sports and activities outside school through community links or sports clubs'	• Challenges: Teacher to set distance/time based challenges on the app, *Challenge the teacher - Who can run the most miles in 10 days.* • Differentiate through personal bests. Who can improve their distance each week? Award the difference made not the final result. • Use **mobile technology** to engage pupils outside of the classroom. Initiate a task in lesson time then allow it to continue outside of curriculum time. Learning needs to take place at a deeper level than just performing in a lesson. If they complete the challenges away from a compulsory setting the teacher can infer that the pupils are thinking about what you are teaching them an potentially making life long choices about physical activity. • Monitoring (**Heart-rate monitors**): Ask 3 different pupils to wear a monitor, set them the task of taking 5 recordings throughout the lesson. Each time they take a recording they must add it to a graph that the whole class can see. • Use the data from the 5 selected pupils to discuss what happens to the heart when exercising.
OAA – orienteering • 'take part in further outdoor and adventurous activities in a range of environments which present intellectual and physical challenges'	• Task Scaffolds: The teacher creates a series of **QR codes** that link to different places around the school site. Students use the QR code reader on a mobile device to read the QR code and solve the problem to find the next code. *Pupils can download an appropriate QR reader as an out of class activity.* • Apps such a '**Pokémon go'**, ask the students to collect an amount of Pokémon within a set time in a given area. *Always be sure of safety with outdoor activities or off site activity choices**
Football National curriculum Link evaluate their performances compared to previous ones and demonstrate improvement	• Organisation and communication: Using an **IPAD** to supplement a Sport Education model. Pupils can take charge of tracking and monitoring their points and team roles and responsibilities. The 'IPAD manager' in the team can create a team profile and upload results, feedback and comments before/during and after lessons. • Students self select a platform to record results that potentially they have knowledge from another curriculum area.

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121   *Table 1.*

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123   Recommendations for integrating technological devices into various sport units

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