

<b>Institution: University of Gloucestershire</b>		
<b>Unit of Assessment: UoA24</b>		
<b>Title of case study: Coaching the coaches: Impacting coach education to enhance movement competency and physical literacy in children</b>		
<b>Period when the underpinning research was undertaken: 2012-2020</b>		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Prof Mark De Ste Croix	Professor of Paediatric Sport and Exercise	2004 – current
Dr Jonathan Hughes	Senior Lecturer in Strength and Conditioning	2012 – current
Mr William Roberts	Senior Lecturer in Sport and Exercise Science (Coaching)	2017 – current
Dr Francisco Ayala	Visiting Fellow Visiting Associate Professor	2017 - 2019 2019 – current
Dr Paul Read	Lecturer in Strength and Conditioning Visiting Associate Professor	2011 - 2013 2019 - current
<b>Period when the claimed impact occurred: 2012-2020</b>		
<b>Is this case study continued from a case study submitted in 2014? Y</b>		
<b>1. Summary of the impact</b>		
<p><b>Professor Mark De Ste Croix, Dr Jonathan Hughes, Dr Francisco Ayala, Dr Paul Read, and Mr Will Roberts</b> research around the development of movement competency and physical literacy in young children has had a significant impact on people, practice and policy since 2012. The significance and reach of the impact are evidenced by the range of organisations who have adopted youth movement competency and physical literacy strategies into their education programmes for sport coaches, as well as the direct impact on players and staff at specific teams. The impact has dramatically changed how coach education is delivered in a number of countries, culminating in a range of interventions, training resources and introduction into formal coach education awards.</p>		
<b>2. Underpinning research</b>		
<p>The underpinning research for this Impact Case study was designed around a RE-AIM (Research, Educate, Adopt, Implement and Maintain) framework and is in three related areas. Each area has informed the design, development, delivery, evaluation and impact of two coach education programmes.</p>		
<b>1. Using artificial intelligence to understand injury risk in paediatric populations and development of a Physical Literacy framework</b>		
<p><b>De Ste Croix, Hughes, Read and Ayala's</b> work in this area is underpinned by a number of highly competitive research grants from FIFA and UEFA which has resulted in the most comprehensive set of published research in the area of injury risk screening in youth. In order to develop appropriate intervention programmes and subsequently influence coach education the team has conducted extensive world leading research using Artificial Intelligence (AI) to understand the causal link in injury risk and movement competency (REF 3). The research underpinning this case study demonstrated that the detrimental effects on physiological and</p>		

neuromuscular function is both age and maturation specific. This research has informed the design and development of a movement competency programme based on innovative statistical approaches compared to previous programmes which are designed on flawed prediction methods to identify risk factors. In Physical Literacy (PL), establishing an appropriate framework is essential in designing appropriate PL programmes. **Roberts** was one of the world-leading experts commissioned by the Australian Sports Commission to develop a PL framework (REF 1).

## 2. Developing and evaluating the effectiveness of movement competency and physical literacy programmes in youth

The AI research into risk factors allowed **De Ste Croix** and **Hughes** to design and evaluate a movement competency programme commissioned by the English Football Association (Reducing Injury in Sport with Kids – RISK). The efficacy of the intervention programme was high, showing significant improvements in movement competency and reduced injury risk in female football players (REF 4). BOING was developed in 2014, and was built on the development of the PL framework and the research of **Roberts**, demonstrating significant impact on children engaged in BOING. This evidence-based research led to Sport England and UK Coaching adopting BOING as a key driver for workforce development and impacting children's physical literacy. Given the efficacy of these programmes in developing movement competency, reducing injury risk and enhancing PL in youth and in order to enhance the reach of the impact on children, two coach education programmes were developed and their impact on coaches and children evaluated via commissioned research.

## 3. Coaching the coaches: Development, delivery and impact of coach education for youth sport

RISK and BOING have focused on developing coaches and PE teacher's knowledge, attitude and confidence to deliver movement competency and physical literacy to children in clubs, schools and community settings. Employing a RE-AIM framework, the impact of the programmes have been evaluated in terms of adoption, implementation and maintenance of new knowledge and confidence. RISK secured competitive ERASMUS funding to evaluate the impact of the workshop on 300 coaches' (delivering to 4,500 children) knowledge, attitude towards and confidence to adopt, implement and maintain movement competency training in their coaching, across 3 European countries (REF 6). Subsequently the England and Wales Cricket board (ECB) commissioned the research group to deliver and evaluate RISK to its coach educators and roll out as a compulsory element of the coach education provision to all level 1 and 2 ECB coaches. In 2019 BOING developed a coach education programme to share the games and pedagogical principals related to PL to 63 partners including 50% of all active partnerships in England. Sport England commissioned **Roberts** to deliver and evaluate the effectiveness of this programme to 1600 coaches (delivering to over 70,000 children).

## 3. References to the research

1. Keegan, Richard J, Barnett, Lisa M, Dudley, Dean A, Telford, Richard D, Lubans, David R, Bryant, Anna S, **Roberts, William M**, Morgan, Philip J, Schranz, Natasha K, Weissensteiner, Juanita R, Vella, Stewart A, Salmon, Jo, Ziviani, Jenny, Okely, Anthony D, Wainwright, Nalda and Evans, John R (2019) *Defining Physical Literacy for Application in Australia: A Modified Delphi Method*. Journal of Teaching in Physical Education
2. **Roberts, William**, Newcombe, Daniel. and Davids, Keith (2019) *Application of a Constraints-Led approach to Pedagogy in Schools: Embarking on a journey to nurture Physical Literacy in Primary Physical Education*. Physical Education and Sport Pedagogy
3. Oliver, Jon, **Ayala, Francisco**, **De Ste Croix, Mark**, Lloyd, Rhodri, Myer, Gregory and **Read, Paul** (2020) *Using machine learning to improve our understanding of injury risk and prediction in elite male youth football players*. Journal of Science and Medicine in Sport.

4. **De Ste Croix, Mark, Hughes, Jonathan, Ayala, Francisco**, Taylor, Luke and Datson, Naomi (2018) *Efficacy of Injury Prevention Training Is Greater for High-Risk vs Low-Risk Elite Female Youth Soccer Players*. American Journal of Sports Medicine
5. Pomares-Noguera, Carlos, **Ayala, Francisco**, Robles-Palazón, F., López-Valenciano, Alejandro, López-Elvira, J. L., Hernández-Sánchez, Sergio and **De Ste Croix, Mark** (2018) *Training effects of the FIFA 11+ Kids on physical performance in youth football players: a randomised control trial*. Frontiers in Pediatrics
6. **De Ste Croix, Mark, Ayala, Francisco**, Sanchez, S, Lehnert, Michal and **Hughes, Jonathan** (2020) *Grass-root coaches' knowledge, understanding, attitude and confidence to deliver injury prevention training in youth soccer: a comparison of coaches in three EU countries*. Journal of Science in Sport and Exercise.

#### 4. Details of the impact

The research undertaken by this group has demonstrated a clear impact on children's injury risk, levels of physical activity and building social and emotional confidence by introducing these skills to children. In order to develop the reach of the impact on the end-user (children) a strategic direction of the research since the 2014 REF was to develop coach education workshops (for all coaches and PE teachers, from grassroots through the elite pathway) and evaluate their effectiveness, whilst impacting on a range of workforces beyond football (which was the focus in 2014). Ongoing work with individual clubs has led to enhanced impact and reach beyond those clubs. A good example of this is how Bristol Bears Rugby club have upskilled their own coaching workforce but have also modelled the injury prevention programme for rugby in and around Bristol within their feeder schools, clubs and coaches (see **Van Klaveren** Testimonial). National and International organisation buy-in was central to the success of the impact on workforces, and is evident in the wide range of sports and community organisations who have adopted these practices (e.g UK Coaching, Sport England, English FA, England and Wales Cricket Board, GB Hockey, Czech Football Federation, Czech Handball Federation, Murcia Football Federation and Australian Sports Commission).

#### Impact on Children:

The extent of the reach of the impact of BOING on children is the development of 63 strategic partners, including 50% of all active partnerships in the UK, community projects (e.g., the Change Foundation, Street games, LEAP) with over 3200 members and 29,000 unique visits to the website means that over **70,000** children are 'BOINGing'. An example of effective partnership working is with the Girl Guides in the UK, where BOING games and pedagogical principles have been embedded in packs for over 500 Girl Guide centres, with over 50,000 young girls receiving access to BOING. Both RISK and BOING have been delivered to over **3000** coaches, PE teachers and community volunteers in a number of European countries. This additionally equates to around **45,000** children being newly exposed to movement competency training and physical literacy. During the recent pandemic BOING was one of the promoted programmes (Join the Movement Campaign) by Sport England to enhance children's physical activity and social and emotional well-being. The impact of BOING on schools and teachers: "I would recommend all Physical Educators in schools to check the program out to see how it could benefit their pupils, staff and school as a whole"; parents "Boing is an exciting and simple way of getting children active, whilst learning transferable skills without them realising they are doing it as they are having so much fun"; and coaches "Boing..has challenged and inspired us as a group of coaches", across the UK is evident. However, the impact of BOING on children is most striking: 'At the end of Boing I feel like congratulating myself for joining in' (child 1); 'I have learnt how to trust people. At the end of Boing I feel energised (child 2)' (see **BOING website**)

Since developing and evaluating the effectiveness of a football movement competency training programme for the FA in 2014, (REF 1) the research has continued to impact female youth players. Over **600** girls in the FA advanced coaching centers (ACCs) have received movement competency training, some for 6 years, and the FA have seen a reduction in injury incidence 'I'm seeing the difference that it can make to injury rates in the girls. The impact of the programme is proven..'(**Lawler-Edwards**). In terms of reach, upskilling coaches beyond the Impact case study

(REF3) Page 4 ACC into county clubs in the south west of England, has meant circa **1,800** youth female players are receiving movement competency training that has been shown to reduce injury rates.

RISK has also had an impact on physical education in schools, on both the workforce and children. After being approached by a Director of Sport to develop a movement competency aspect to a gifted and talented programme, the upskilling of the PE workforce in the school meant staff developed confidence and competence to integrate the programme into all PE lessons and extra-curricular sport. The impact this has had on children across the school is evident in the testimonial of **Phillips**: “What we have found is there's no question that there's been less injuries within the groups that are part of the programme and there's certainly evidence that they are more proficient in their movement”

#### **Impact on Coaches and their practice:**

Both BOING and RISK have significantly impacted on coaches in terms of knowledge, attitude towards and confidence to deliver movement competency and physical literacy to children. In evaluating the impact of the RISK workshop on 300 coaches in 3 European countries, coaches were adopting and implementing their newly gained knowledge. Establishing adoption is crucial in evidencing that the impact of the workshops go beyond knowledge gain and is evidence of coaches changing their practice. The impact of the change in coach practice is also evidence of an impact on the children receiving the movement competency training and reducing their injury risk. The impact of the adoption of BOING continues to be evaluated via commissioned research from Sport England, with 1600 coaches, and has already indicated a significant impact in increasing knowledge, attitude and confidence to delivery physical literacy through play. The reach of the impact of BOING via partnership with Sport England is evident: “opening up the minds of coach educators and coach developers and system builders within some of our partner organisations..it's having a growing impact from the individual up to the coaches, the coaching system and then obviously the wider sector.” (**Kitson and Armstrong**). A strategic partnership with UK Coaching is further evidence of the reach of the workforce impact of both BOING and RISK. The work with UK Coaching is based on organizational influence in terms of the strategy of developing youth sport coaches to positively impact on youth sport: “It's influencing and shaping what we do...to support the wider coach development workforce.” The impact that UK Coaching workshop delivery of BOING has had on coaches is extensive: “had a huge impact on the coaching craft and coaching practice of many coaches...People engaging in it and finding confidence and passion.” (**Hartley and Davies**). The reach of the impact from the workshops is evident in the range of organisations noting the development in their workforce, including GBHockey “By providing access to this support for coaches..we are seeing real change in the way coaches approach the support of young people.” (**Guise**)

RISK has developed the FA workforce in the SW of England and here has been impact beyond the ACCs with grassroot coaches at local clubs being upskilled by ACC coaches. The growing reach of this programme means that circa **120** clubs and coaches have been directly impacted by gaining new knowledge and changing/enhancing their practice. **Lawler-Edwards** notes: ‘upskilling the staff...what is important is that the staff continue to coach those techniques....that's something that's impacted on the staff’. After being commissioned by the ECB to evaluate the impact of the workshops on circa 60 coaches the ECB invited all registered coaches (n=**7000**) to attend an online version of the workshop in early 2021: “The impact of Mark running a number of workshops for us to spread out through the country has just increased coaches knowledge, attitudes and beliefs around how their own coaching impacts on players physical movements” (**Ahmun**). **Ahmun** notes the impact on the ECB workforce in terms of enhanced knowledge, confidence and adoption of the programme: “coaches are now more aware that they can have an impact on a young athletes ability to move...”

#### **Impact on Organisations:**

The physical literacy research of **Roberts** was used to develop the Australian Physical Literacy Framework, commissioned by the Australian sports commission. The impact of this framework across the Australian sports sector has been extensive, by influencing all National Impact case study (REF3) Page 5 Sports Organisations participation programmes/planning and the products they develop. This includes the national sports plan 'Sport2030', national funding of a new school programme 'Sporting schools plus', and a change in the national physical activity policy 'MoveitAUS' to a physical literacy model. **Comis** notes the extensive impact on the workforce across Australia's sport and PE sector based on the adoption of the framework by organizations: "workforce development both in the sports sector with coaches and coach development, but also in the education sector with teacher training, in physical education." The reach of the impact of this framework is evident in its adoption in framing a physical literacy evaluation project in 8 European countries and its adoption by Sport New Zealand.

The RISK research also impacted on the FA in enhancing and developing the workforce by creating new roles at each ACC: "it has impacted as all ACC's now have their own Sports therapist and or S&C coach. This is not part of the criteria but the research made them see a gap in the provision and wanted to offer this" (**Lawler-Edwards**). The impact of this programme led to **De Ste Croix** being a founder member of the FAs Research in Women's Football group, with the strategic remit to impact on the FAs new four-year strategy, titled '**Inspiring Positive Change**'.

In order to establish the recognised impact of RISK on coaches and children the intention was to influence policy change in the coach education content of coaching awards/pathways to incorporate movement competency training and physical literacy. The clear impact on coaches in the commissioned research of the ECB has led to the development of changes in the compulsory elements of cricket coach education in England and Wales with a youth movement competency module being introduced into the compulsory level 1 and 2 cricket coaching awards: "embedding that in policy, definitely....it is a massive step forward in moving the whole process forward." **Ahmun** summaries the impact of the RISK project by stating: "it's had a real big impact...a key driver to improve the physical literacy of the young players.."

Another example of embedding BOING into NGB coach education strategies is with GB Hockey. As a governing body, they are embedding BOING in the coach education pathway as a central tenet of all coaches exploring contemporary pedagogical principles. **Guise** states "We are excited to explore how we integrate Boing into our coach development offer through our formal governing body awards because we are seeing real change in our coaching workforce and the communities they work with."

#### 5. Sources to corroborate the impact

1. **FA: Senior Talent Technical Coach** - Sarah Lawler-Edwards
2. **ECB: National Lead for Strength and Conditioning** - Rob Ahmun
3. **Sport England: Development Manager Coaching and Professional Workforce; Strategic Lead for Workforce Transformation** - Sion Kitson and Stuart Armstrong
4. **GB Hockey: Head of Coach Development** - Stuart Guise
5. **UKCoaching: Senior Coach Developers** - Marianne Davies & Tom Hartley
6. **Sport Australia: Director of Physical Literacy and National Participation** - Pierre Comis
7. **Bristol Bears Rugby: Athletic Performance Coach** - George Van Klaveren
8. **Director of Sport: The Kings School Gloucester** - Andy Phillips
9. **Project Manager Girlguiding** - Louise Barks
10. **BOING Website** (<https://www.boingkids.co.uk/research.html>)