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Tēnā koutou katoa,

Welcome to the first edition of
Physical Educator for 2018.

After a constructive summer break, a significant amount of work and development has been happening around the PENZ head office. CEO Richard Van der Jagt has produced a clear outline of the progress and goals for this forward movement of PENZ, through his report and detailed strategic plan. President Margot Bowes informs us of changes within PENZ, in our 'Movers and Shakers' section, as we learn more about colleagues we have bid farewell, others we have welcomed and who has been moving around within the sector.

The catch phrase 'Academic subjects' is a term that is regularly banded about in the media, often without clarification or sound research. This term and its implications, is challenged and explained by Dr Susannah Stevens, in an informative article with an academic's focus on the holistic perspective of education and what this means for our young people.

As the winter codes are beginning to gain momentum, we have some timely research by Lee-Ann Taylor and Patrick Lander surrounding our adolescent netball players. Dr. Dennis Slade provides some more valuable resources to add to your year plan, with an inquiry based approach to athletics, focusing on processes and not comparative performance. Dr Slade presents an in-depth examination of this approach; complete with a detailed layout of how to set up the equipment and environment for successful application.

With the 60th PENZ conference being held in Dunedin in just a few months, bookings are essential to secure your spot for this special event, so now is a good time to remind your department.

We wish you all the best for the Term break and hope it offers some time to refresh and recharge.

Ngā mihi nui

Maree Cotter



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'Academic subjects' - It's time to change the record.

Written by Dr Susannah Stevens Physical Education New Zealand

A response to *The New Zealand Herald* article on the NCEA debate and the question "How can physics and tramping be valued equally?" published on the 4th March 2018.

You may have read the article in *The NZ Herald* commenting how students of NCEA want credit parity across subjects. It opened with the question "How can physics and tramping be valued equally?" The writer of the article, to his credit, identified some great points about the need for a wide curriculum and a more holistic education; which was great to read. However, the topic, the title, and the continued use of the terms 'academic' vs. 'non-academic' left an unpleasant ring in the ear. We have heard this record before and the tune is starting to sound a little flat and repetitive. Nevertheless, it is not surprising that this reoccurring topic has been dragged up yet again. In fact, The NZ Herald themselves wrote about it on the 10th of December 2017. Minority subjects, such as physical education (PE) and outdoor education (OE), have historically struggled for validation as 'credible' subjects in education and continue to do so (Booth, 2009; Culpan, 2005; Hokowhitu, 2004; Kirk, 1992; Pringle, 2010; Stothart, 2005).

It would be easy to launch into a justification for the importance and educational value of what *actually* happens in the Health and Physical Education (HPE) learning area. Arnold's (1979, 1994, 1998) three categories of movement meanings (primordial, contextual and existential)

would be a good place to start. Specifically, the focus on learning 'in' movement, 'through' movement and 'about' movement, rather than a more traditional physical education that historically focused on just the latter. These theories significantly influenced the development of New Zealand's physical education practice and curriculum and continue to influence teachers today (Culpan, 1998, 2000, 2004). It would be easy to justify HPE by its underlying concepts - employed to educate our students how environmental factors impact on our decision making, access to resources, success in life, health and overall wellbeing. We could additionally justify PE or OE by explaining that 'knowing' and creating knowledge through moving, such as throwing an object to understand force summation, helps to make sense of the learning itself (Meyer, 2000). Or by acknowledging the importance of this moving body constantly engaging and interacting with the environment to allow for growth and learning, shaped by the complexities of the milieu, constructing a worldly view (Burkitt, 1999; Lundvall and Maivorsdotter, 2010).

We could go further and discuss how western, neo-liberal privileging of the written 'academic' text still exists in schooling where our bodies

are treated 'as the excess baggage of pedagogy' (McWilliam, 1999, p. 133). Therefore, indicating that the very nature of a debate between physics and tramping actually reinforces a traditionally western human body dialogue; which views the body separately from the mind, enabling it to be controlled and objectified (Bordo, 1993; Kenny, 1970). This is an out-dated perception that correspondingly, has led to considerable work that opposes this view of the body (Dagkas & Quarmby, 2012; Foucault 1979, 1980; Markula & Pringle, 2006; McLaren, 1991; Merleau-Ponty, 1962; Sartre, 1957; Shilling, 1991, 1993, 2004, 2008, 2010; and Tinning, 1997).

However, this constant need to justify the existence of our subject area is getting tiresome. We are sure most 'minority' or 'un-academic' subjects would probably agree with us on this matter. Alas, it would seem our societal desire for performance, competition and a singular definition of success continues to navigate our thinking and decision making process when it comes to education. So instead of advocating for the importance of HPE, and comparing subjects, how about we talk about the bigger issue here? Perhaps it just comes down to the fact that the acronym 'PASS THEM'L'¹ is just not as

¹ The author has created an acronym based on all 8 of our NZ learning areas represented in the New Zealand Curriculum; Health and Physical education, the Arts, Social sciences, Science, Technology, Health, English, Mathematics and statistics and learning Languages.

catchy and appealing as 'STEAM'².

The article in *The NZ Herald* spoke of things being 'equal', which could be defined as;

- i. being the same in quantity, size, degree, or value.
- ii. people having the same status, rights, or opportunities.
- iii. being uniform in application or effect; or without discrimination on any grounds.
- iv. being even or fairly balanced (Oxford University Press, 2018).

The real trouble here is the difficulty in measuring and labelling value, and the obsessive desire for society to have a sense of 'sameness'. However, this is incredibly difficult to achieve when our students don't all have the same access to resources, the same history, cultural upbringing, life experiences, wellbeing, finances, and environments. So with this in mind, wanting and expecting the 'same' can actually be unfair. Would we expect all of our students at school called *Martin* to be the same, simply because they were called *Martin*? This seems quite ludicrous when you read it. Yet, expecting two students that have the same name to be the same, is similar to expecting the same thing from two students who simply share an age or an NCEA level. NCEA may not be perfect, but it does allow for learner difference, and it would be disappointing if we circled back to a bell curve to teach us how 'successful' we are.

The comparison of subjects is not the central issue here, rather the constant need for hierarchy, control, and standardisation in education. Moreover, it is the de-professionalisation of teachers and educational professionals to make sound judgements when it comes to observing this learning.

It is, as Brancaleone and O'Brien (2011) suggest, the convenience and attractiveness of measuring the performance of a learner rather than capturing information to develop the learning process itself. For example, the simple act of labelling some subjects at school 'academic' continues to entrench this archaic paradigm of performance. This is evident in the way society readily and enthusiastically compares tests for the *Programme for International Student Assessment (Pisa)* to see how our NZ students can match up to their international counter parts. If only we injected the same level of enthusiasm into the bigger picture of education; such as working towards UNESCO's sustainable development goals (UNESCO, 2018). Which by the way, if you were not aware, do not mention physics or tramping once.

There is no doubt that learning skills like language, literacy, and numeracy improve our quality of life; but how those skills are learned, expressed and used are innately part of our creative, moving bodies (Stevens, 2017). Our 'intelligence' is greater than a brain, conveniently transported around by a 'body shaped' vehicle. For example, the feeling in a surgeons fingers are just as important as her ability to manage time, understand her emotions in theatre, recall her anatomical knowledge, or work in a team. Likewise, a bomb disposal technician doesn't separate their skills into subject areas or assessments. Take a moment to think how ridiculous this would be with a clock counting down from 59 seconds...

Ok, think Jess, think...breathe... I've just got to keep my nerve, people are watching (Drama). I can work alongside Greg, whilst he holds this wire and assesses

the societal impact of this stress on our wellbeing (Health and Physical Education). I'll be fine... Breathe... I think if I can reduce the odds, the probability of it going off will be reduced (Mathematics) and I know that it's dark, but my fingers remember what to do in this situation (Photography)... Breathe... If I can just follow the exact steps needed for the desired outcome (Food technology) and make sure I position myself to think about trajectory, mass and force if it goes off... (a special shout out for Physics there).

You see, to assume one subject is better than other, or 'worth' more is simply uneducated or naïve. Even physics and tramping are one in the same to a curious scientist:

The leg is a physical pendulum. The most important characteristic of any pendulum is the frequency of its free oscillations... When you walk your legs perform forced oscillations under the action of your muscles. The characteristic feature of forced oscillations is that their amplitude depend not only on the size of the force but also on the frequency with which it varies (Urusovky, 2000, p20).

Yet, both subjects are simply useless without a contextual understanding of how they can contribute to the development of a human being in a culturally responsive educational setting that is relevant for the student learning within it. Teachers and educational professionals understand this because this is *learning*, not credits. So perhaps just let us, or more to the point, just *trust* us to do our jobs. Both the physics and the tramping student are being

² Science, Technology, Engineering, Arts and Math, otherwise known as STEAM is an international popular focus in schools to best prepare students for the future.

supported in ways that perhaps they are unaware of, the teachers selection and use of appropriate pedagogy or emotional intelligence for example.

Regarding the comments published in *The NZ Herald*, made by the school students who want things to be equal at their school – It is absolutely brilliant to see students having conversations that confront the norm, are critical, and challenge educational policy and practice. This is critical thinking, is an important part of the inquiry process and shows a level of intelligence that we do not measure in an end-of-year school examination. It is fabulous that students are passionate about learning, want to do well and would love to be rewarded for their hard work. However, if a student in one of our schools whole-heartedly believes that they deserve ‘more credit’ than another student because of a context, an interest or a talent, then perhaps we have failed as educators, parents and human beings. We have effectively taught them to argue for an outdated, traditional hierarchy of western subjects.

‘Academic subject’ is an old-fashioned title that needs to be dropped from education, and it would be great if we could change the record. Then again, what would I know? I hold a PhD, but I am pretty sure most of my credits at school came from participating in ‘day tramps’.

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Movers and Shakers:

Existing and new members – **Margot Bowes**



Lisette Burrows

Professor of Community Health

Lisette has joined the Faculty of Te Huataki Waiora Faculty of Health, Sport and Human Performance, as a Professor of Community Health. She has come to Waikato from the University of Otago's School of Physical Education, Sport and Exercise Sciences. Lisette is a past president of PENZ, a holder of the Sir Alexander Gillies Medal and served on the Board of PENZ for 10 years.

Her research explores the place and meaning of health and physical activity in young people's lives, canvassing social justice issues as they relate to health promotion 'initiatives'. She has published extensively, including work on gender, ethnicity and disability in school-based physical education and young New Zealanders' constructions of health and fitness. Her work is firmly grounded in the community, and she has explored how policy and practice impact on young people and their families across cultures.

Jo Colin

Sport New Zealand (SNZ)

Jo Colin has been the Young People Lead, Expertise and Capability at Sport New Zealand for the past three years. During this time Jo has worked hard with and for PENZ to ensure that:

"We can change lives if we offer young people innovative and high quality PE, physical activity and sports. I believe all kids deserve the chance to experience that."

In December 2017, Jo returned to the UK to take up a newly created role of Head of Children & Young People (Programmes) at Sport England.

Jo's last email to PENZ stated that:

"It has been a real pleasure to work with and for you over the last 3 years to help drive a system that ensures all kiwi kids get fun and quality opportunities and experiences."

Thank you again for your energy, time, support, passion and commitment to the work I have been developing and leading. I hope you'll continue to lead the movement for all Kiwi kids to get the best possible experiences that ensure they develop a life-long love of being active."

PENZ wishes to acknowledge the partnership and work that Jo did to ensure that quality Physical Education is understood, valued and experienced (The PENZ Vision).



Ben Dyson

Associate Professor returns to the USA

After eight years at the University of Auckland, Faculty of Education and Social Work, Associate Professor Ben Dyson has recently accepted a position at the University of North Carolina at Greensboro. Ben will be replacing Cathy Ennis at the University of North Carolina.

Ben is the recent past Editor of the Journal of Teaching in Physical Education. He is internationally recognized as a leading researcher in Physical Education in two related areas of scholarship: research on innovative curriculum and pedagogy in schools and Cooperative Learning as a pedagogical practice. Since 2006 he has been a Fellow of the Research Consortium of the American Alliance of Health, Physical Education, Recreation, and Dance. In 2017, he was elected Chair of the Physical Education Special Interest Group of the American Education Research Association. Ben has been the University of Auckland's representative on the PENZ Academic Advisory Group and a regular attendee and presenter at the PENZ National Conferences.



Nichola McCall

Board Member and Deputy Principal

Ko Atuanui te maunga, ko Hoteo te awa, ko Kaipara te moana, ko Mahuhu-ki-te-rangi te waka, ko Ngati Whatua te iwi, ko Ngati Rongo te hapu, ko Puatahi te marae, ko Nichola McCall toku ignoa.

Nichola McCall is of Ngati Whatua decent and has recently completed a Masters in Professional Studies where her dissertation was titled Nga wawata o te whanau - Decolonising Education at Manurewa High School. She has enjoyed 10 successful years working

at Manurewa High School and is currently 2IC of HPE and has recently been appointed as a permanent DP at Manurewa HS.

Her areas of interest include creating and supporting spaces where Maori Indigenous knowledge and practices (as defined by whanau, hapu and/or iwi) are validated and legitimised in order to re-frame and re-claim positive Maori self-representations. She is passionate about all students having access to Te Ao Maori (the Maori world view) and developing their bicultural skills through our HPE programmes.

Nichola leads the Māori Advisory Group to the Board and is on the Awards Committee.



Katie Spraggon

Board Member and Deputy Principal

Katie Spraggon is currently Deputy Principal at Manurewa High School. She has been at Manurewa High School for 12 years and Head of Health and Physical Education for three years before taking on a Deputy Principal role. She is currently studying towards her Masters in Educational Leadership through AUT where she is researching curriculum development, design and change leadership. She is also a member of the Auckland



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PENZ branch where she has been involved with developing the Graduate Mentoring Programme alongside other experienced teachers from a range of schools. She has strongly advocated for Health and Physical Education in the school curriculum and the opportunities that it affords our learners.

Katie believes in integrative thinking and leadership which challenges and re-imagines what is possible for learners both in the classroom and beyond. She is excited about the opportunities that exist through PENZ and looks forward to the opportunity to drive further developments and initiatives that nurture and grow communities now and into the future.

Katie leads the Awards Committee supports the Māori Advisory Group.



Joe Morrison

Independent Board Member

Joe Morrison was co-opted onto the Board of PENZ at the December 2017 Board Meeting. Joe holds a BPhEd and an MPhEd (Biomechanics) from Otago University. He is the founder of 'Siliconcoach' and is an Inductee on the Wall of Fame, at the School of Physical Education at the University of Otago. Joe brings a wealth of experience and expertise to the Board. He has an entrepreneurial outlook and brings over 20 years of commercial experience including expertise in digital technologies to enhance learning. He has an in-depth understanding of major software developments and how to foster their commercial success. Joe has been a CEO of three companies and is now interested in using his skills, as an

independent director for PENZ. Joe started his formal training as a Director recently and says that he is excited by the role that Directors can play in the success of an organisation. Joe trains and participates in endurance challenges such as: walking the Te Araroa Trail, MTB events, 1/2 Ironman's and adventure races. Welcome, Joe.



Romana Puchegger

Romana Puchegger is an Austrian-born researcher who recently submitted her PhD thesis in the context of Health and Physical Education (HPE) at the University of Auckland. As a former HPE, Psychology and Philosophy teacher in Austria and researcher in New Zealand, she now focuses on the complexities of teaching moments of HPE teachers' and the influence of the socioeconomic setting.

Furthermore, Romana worked for the University of Auckland in the Educational Leadership Department for the last two years where she was constantly involved in educational support services, such as Community of Learners (CoLs) projects. When she is not glued to her computer or out in the practical field she enjoys yoga, cross-fit, running with her dog and snowboarding. Recently, Romana started to work for PENZ as Subject Advisor for Auckland, where she supports the professional development of HPE teachers.



CEO Report and Strategic Plan

Richard Van der Jugt

Welcome to the first term of 2018. In October 2017, the board was presented with a revised draft strategic plan. In broad terms this plan outlines the mission, vision and strategic priority areas (the “When and What” we focus on) of the organisation for the next three years. This can now be viewed on the PENZ website and has already lead to several important changes of focus for the organisation.

A key outcome of last year’s audit, internal investigations and this year’s strategic plan was to address the lack of automated processes around payments processing, online bookings and resource availability. As a result, a major over haul of our IT capability took place over the Christmas/New Year period.

The IT review was a large undertaking and involved moving the entire PENZ website to a new platform with minimal disruption or loss of information. Two new dedicated websites (subsites) were created. The first subsite is specifically related to Conferences and Workshops, with specialist features including, attendance, payment options, notifications, and an annual events calendar to assist members with professional development and planning.

A second website (subsite) is a dedicated e-commerce platform which allows products and services related to the Health and Physical Education (HPE) sector to be bought and sold. The community will eventually be able to collectively rate and comment on products and services in much the same way as mobile applications are currently rated.

A new members data base has been developed which links with all three websites to a Customer Relationship Management System (CRM) system. This has been put in place to assist subject advisors and head office with membership support, marketing and the project management of contracts.

We are currently investigating a Learning Management System (LMS) and Content Management System (CMS) to enable the community to better protect our intellectual property and store and share resources with other members.

This development has been a huge undertaking and has been in addition our normal preparation. Over the next four weeks we will continue with user acceptance testing, updating the main site and populating the e-commerce site while we fine tune each system.

An important part of the new strategic plan is the ongoing development of our capability to support members. In 2018, we will look to expand the number and specializations of Regional Subject Advisors located throughout the country. The role of Regional Subject Advisors will be very diverse, but the key objective will be a local point of contact for members in addition to leading national initiatives for the sector.

We are still looking to fill the Waikato/Bay of Plenty Region representative, but we have recently appointed Romana Puchegger (PhD pending) to the Northland/Auckland position. As our newest subject advisor. Her focus will be supporting PENZ membership, in addition to leading the role out of the primary based MoveWell initiative in conjunction with ACC. Romana has a strong international background in teaching HPE in years 11-13 and has recently worked for the University of Auckland (UoA) as the Community of Learning (CoL) liaison in the Auckland region.

Susie Stevens has now graduated with her PhD. She continues to work as the Senior Subject Advisor for PENZ and has also been confirmed as the contract lead for Sport NZ and Play.Sport initiatives. She will also be responsible for supporting membership in the Canterbury Region.

Our annual conference is taking place in Dunedin on 9th - 11th of July at John McGlashan College. This conference also represents the 60th PENZ national conference and the 70th Year of the Otago University School of Physical Education so there is much cause for celebration. It provides the perfect occasion to revisit old haunts, catch up with friends in addition to getting some amazing professional development. We will continue to provide updates with respect to speakers, workshops and activities in the months leading up to the conference via our website and social media.

In December, a foundation Memorandum of Understanding (MoU) was signed with the Australian Council for Health Physical Education and Recreation (ACHPER). This agreement outlines areas of collaboration in areas such as research,

professional development and advocacy. Over coming months these areas of common interest will be explored in detail and plans for collaborative activities will also be mapped out. We are also reviewing our existing MoU's with NZHEA and EONZ with the view to extending the collaboration and the support we provide to each other at a professional and political level.

The change of government has brought with it a slew of new initiatives, working groups and strategic priorities. All the outputs of these groups will have to be carefully reviewed to ensure our subject area remains intact and stronger than before. Over coming months areas signaled for change by the new minister Hon Chris Hipkins include:

- a. A review of home based early childhood education
- b. A review of Tomorrow's Schools
- c. An action plan for Learning Support
- d. NCEA review "a new approach to measuring learners"

Advocacy for quality physical education is a big part of what we spend time our time and energy on. Over recent weeks we have provided commentary or feedback on the following:

1. Proposed changes by NZQA on Scholarship Health and Physical Education
2. The development and implementation of a Quality Assurance System. A change in approach for external

sports providers who work with primary schools.

3. Providing feedback to new qualifications, majors, minors or endorsements for Otago Universities new Bachelor of Applied Science degree.
4. Written to the Hon Carmel Sepuloni re the collection of personal information and ownership of the Intellectual Property data of the next Youth Health and Wellbeing Survey
5. Responded to New Zealand Herald Articles: Physics vs Tramping and requests from the Education Gazette for an articles and information on the Impact of Technology on HPE.

Later this year we intend to take a careful look at our ongoing professional development programme, to see what can be changed to make it more responsive to your needs. This might include the provision of "hot topic" webinars, workshops, resource creation and distribution, or simply providing the platforms to enable members to better connect.

Finally, thank you to all members who have paid their annual membership. The Board has been able to move me to fulltime from early April and bring PENZ staff back up to full capacity in an effort to support you, the members better. If there is something you would like to see changed or added with respect to our current projects, then please don't hesitate to let us know.

TOGETHER, TOWARDS TOMORROW

60th National Conference

Monday 9th July - Wednesday 11th July 2018

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The joy of movement in physical education: The enfleshed body.

Dr Susannah Stevens

The joy of movement is not a simple feeling or a state of mind. It is enfleshed, and this means it is a combination of physiological and psychological factors that are shaped by the space, time, context, socio-cultural and political parameters in which they occur.

In physical education, the joy of movement is institutionalised. Pleasure is not prioritised within the typical performative, assessment driven culture seen within secondary physical education settings. The joy of movement that does exist, conforms to behaviours and movement that is typical of traditional sporting, able and performative bodies. Furthermore, this joy of movement relies on a student's wellbeing. For example, a student

will not engage in movement that could bring them joy, if there is a risk to their social wellbeing. However, students exhibit an aberration of spontaneity and playfulness in physical education, a desire to disrupt this 'performative joy'. It was this very finding that led to the conception of a pedagogical framework called Enfleshed pedagogy. Utilising playfulness, students are required to identify institutionalised movements and explore alternative movement that prioritise individual sense-perception. This critical framework requires social action, but rather than a group action, it requires a social action of their 'self'; a disruption to their own institutionalised movements. Marathon in October this year – time for training permitted of course!



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The PENZ team are also working hard to provide you with a Learning Management System (LMS) and a Content Management System (CMS) over coming months. Using the Learning Management System (LMS) you will be able to access PENZ Resources, Webinars, Podcasts, PowerPoint presentations or video content, we are working on a resources sharing agreement with ACHPER in Australia which when completed will allow members access to resources produced from across the Tasman as well as in New Zealand.

The Content Management System (CMS) will enable you to share and rate the quality of resources with other people in the community. The CMS will be more than just a repository for information, it will have the capacity for you to pull together information from a whole range of sources and easily create new interactive lessons or story boards to assist with student research, self-directed activities or lesson planning. Look out for both of these new systems to come on line around mid-year.

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Two essentials for the PE department.

Literature review by **Dr Susannah Stevens** for PENZ

FOR THE RECORD; AN ENCYCLOPAEDIA OF HISTORICAL ASPECTS OF NEW ZEALAND PHYSICAL EDUCATION

AUTHOR: BOB STOTHART WITH IAN CULPAN.

DICTIONARY OF PHYSICAL EDUCATION AND SPORTS STUDIES

AUTHOR: BOB STOTHART AND IAN CULPAN.

No, this is not a joke, this is a genuinely a review of a dictionary and a historical encyclopaedia. Even typing it sounds arduous, terrifying and useless for a practicing physical educator. Well, these assumptions are downright wrong. These two books have made the PENZ journal this month for very good reason - they are both incredibly useful. In fact, you could say these two books are a staple for physical education departments, offices, or academic book shelves nationally. There is no use arguing that they should be available online; there is no doubting they should be, and it would be wise for the author to consider this. Online availability would make for an easier updating and feedback process to ensure these books stay current. However, it would be a shame if this reasoning prevented you from owning these books. That is due to the fact that these books, like your morning coffee, are not just useful but are essential. They are well written, easy to comprehend and do not play out content or try to prove anything. These books, like their authors are humble and therefore make for easy, enjoyable reading. For example in the dictionary, the authors make no claim to profess a finite definition, nor singular interpretation of concepts. They do however, state that 'our objective has been to provide useful references across what we perceive as the essential

components of contemporary physical education and sport studies' (Stothart & Culpan, 2016, p3).

The dictionary is both valuable and convenient. It could easily be given to a L2/3 physical education student who is completing NCEA sociology tasks and wants to know the difference between equity, ethics and equality. Perhaps a scholarship student needing to understand the difference between the Olympic Charter, Olympic Humanism, Olympic Truce and Olympism? This bright green A5 size book reminds us of the terminology we cannot re-count automatically, but need in physical education. Flow? Flipped classrooms? Ischemia? Inquiry based learning? Gender? Game sense? This dictionary houses most of the terms we use in HPE in one place. At the end of a long week, if you just need someone to remind you of the difference between epidemiology, epistemology, Epicurean Theory and epiglottis then this dictionary is for you. If you can spare the cash it is well worth having a few of these lying around.

The encyclopaedia is equally beneficial, but for richer meaning. It is also a very small, compact book, so shake off the preconceived ideas of what an encyclopaedia might look like. This book contains practical, helpful information, such as the list of physical education acronyms on page 14. However, this is not its focus or strength, which could be argued is the wealth of rich, historical insight that is contained within. An easy to read, illustrated book that seeks to inform the profession of the past, to enlighten the future. The foreword states: "It is doubtful whether the physical education profession, or any other profession for that matter, could exist unless specialists in the discipline have an in depth knowledge of the past, or the pioneers and the philosophies that have gone before"

(Stothart & Culpan, 2012, p1).

The very reason why this book has use? Physical education has changed greatly over the last 20-30 years and it continues to do so, nevertheless our practice is continually shaped by history and understanding this informs and enhances our teaching. How many of you recall that folk dance was promoted by the Ministry of Education in 1957, remaining popular right through the 60's and 70's? Do you still use folk dance today? Perhaps it interests you that the word 'drill' derived from military physical training as early as 1877 and was taught by military personnel can enlighten us about why we have current trends. Ex-army 'instructors' were appointed by education boards to teach physical education, which was a requirement of the 1877 *Education Act*. 'Bootcamp' starting to sound familiar?

These two books deserve consideration. As a leader you could use these books in your departmental PLD - try the word of the day, or revisit those concepts previously lost or assumed as 'known' already. If you have a bit longer, enlighten yourself of the uniqueness of Aotearoa's unique physical education history and the way it has influenced how we presently educate. From mitosis to modernism, these small but sincere elucidations encourage a greater awareness and understanding of our profession, therefore are worth the investment.

Full references:

Stothart, B. & Culpan, I. (2012). *For the record; An encyclopaedia of historical aspects of New Zealand physical education*. University of Canterbury: Christchurch, New Zealand.

Stothart, B. & Culpan, I. (2016). *Dictionary of physical education and sports studies*. Aries Publishing: Whitianga, New Zealand.

The dictionary is available through aries publishing (ian@ariespublishing.co.nz) or www.ariespublishing.co.nz \$35 + \$6 post and packaging per copy. Discounted rates for bulk purchases of 10 or more.

The encyclopaedia is available through Ian Culpan (ian@canterbury.ac.nz) at the discounted rate of \$20 + \$6 post and packing.

A Physical Education in Athletics Rather Than an Education in Athletics: An Enquiry Based Approach

Dennis G. Slade, Andrew J. Martin, Geoff Watson - Massey University

Teaching athletics in schools has traditionally been heavily weighted to performance, for example, noting distances and times, and the inevitable comparative performance focus between students. This article provides an overview of a more holistic and flexible enquiry based teaching approach to offering athletics in a physical education (PE) context.

Teaching athletics

Observations of a PE class being 'taught' athletics in the traditional 'command mode' of teaching are that instruction takes a generic technical form and participants are encouraged to be the best in their peer group, for example to throw an object the furthest distance. However, many students appear to lack motivation to participate at this level or within that philosophy of instruction because they do not find the technical instruction stimulating and the aspect of peer competition tends to reward their more physically developed classmates. In contrast, most students appear to be engaged when 'playing' games, often asking "please sir, when can we play a game?" (Slade, 2018). The approach described below, is arguably closer to 'playing' athletics in a secondary school PE class setting.

At the heart of this enquiry based approach to PE teaching, is an effort to try and find a structure around play that makes athletics interesting and something that a majority and not a minority of students enjoy doing. The philosophical starting point for achieving this aim was to change from teaching athletics for performance outcomes, to an education in and through athletics. Of course performing athletic events well was congratulated, but it was just as important to understand and to emphasise how the movement worked as to being a star performer. The following example is based on a jumping theme developed for secondary school Year 9 classes.

Jumping theme

On entering the gymnasium for this lesson the Year 9 class would see the space filled with equipment such as gymnastic mats, hoops, basketballs, rugby balls, benches, mini and standard trampolines. The layout was to raise the curiosity of the average student and motivate them to want to try something. It was explained to the students that the theme of the lesson was jumping and they would get an opportunity to try various sorts of jumps. In between having turns, they were encouraged to come back to the white board and ponder the various questions written there about the nature of some of

the jumps. Typical questions were:

- What shape run-up did you employ on the high jump?
- In this jump, what projection is most important, vertical or horizontal?
- Which way is the force directed in a high jump?
- Does anyone know if there is a law in physics relating to this action?

Near the end of the lesson there would be an opportunity for the class to collectively answer the questions. The white board questions that promoted a discovery approach to understanding jumping were important to show students that they could do well in PE and receive positive feedback, not only by virtue of being athletically gifted but also through understanding movement. The questions were attempts to teach understanding in movement as much as performance and engage students as active agents in their own learning.

There were always between 10 and 12 jumping activities. Some of the non-athletics specific jumps included: jumping for a lineout from a rugby ball throw-in, a jump shot in basketball, a rebound jump and throw basketball style but off the wall of the gym with a volleyball, and a standing long jump onto a gymnastic mat. The standing long jump focus was not about comparing their total distance with anyone else, but seeing if they could jump beyond their own height. Other standard jumps included a basic triple jump, using hoops to help coordinate the sequence before landing on a mat and a high jump.

There was time enough for a pair of students, or a group of three, to explore the different types of jumps. After safety issues were explained, they went to their first activity before rotating every 4 or 5 minutes or so to the next jump.

The jumps most enjoyed were those that included the mini-trampoline and the trampolines; for example, imitating a springboard dive preparation jump. The mini-trampoline was placed at the end of a Swedish bench up against a high jump landing mat. The students would complete a three-step hurdle approach along the bench before taking off on the hurdle, landing on the mini-trampoline and then, depending on gymnastic ability, land standing up, complete a forward dive roll or somersault onto the landing mat. The students were told that this sequence was in preparation for diving that would form part of their aquatics programme. The two trampolines were used to firstly require a safety-based 10-bounce basic sequence to stop. On the larger trampoline the sequence started with one foot on the frame and required the three-step hurdle action to launch into a bounce and either a standing landing, a front drop (also called a face drop) or even, if they said they could do the action, a somersault.

Overall, the classes enjoyed this enquiry based approach to the jumping activity and nearing the end of the lesson when students gathered to discuss the questions it gave a whole range of them a chance to shine and participate. Answering the questions did not require procedural knowledge or movement competence, but instead critical thinking about how to jump, the different approaches required of a jump, and whether it was just vertical projection that was required or something else. A subsequent lesson utilised peer-assisted learning to complement instruction, with students being encouraged to give three pieces of feedback to each other as they completed the jumps, which were prompted by having aspects of the specific jump or style written on laminated cards to help them in what to look for.

Improved participation and positive atmosphere

This enquiry based methodology of instruction completely changed the atmosphere for teaching athletics. The high jump bar was set at a level barely above the height of the landing mat and by placing a vaulting box bench top in front of the landing pad, clearing the bar was never an issue. Additionally, it was fun with the mechanics of the jump to experience falling onto the mat from a reasonable height. The vaulting box was also used as a take-off for long jump into the jump pit, in order to give the students time in the air and actually perform a hang technique that typically, was well beyond the capabilities of the average student to experience without this aid.

These brief examples illustrate how students were encouraged to play at, understand and to enjoy athletics, as it was about processes and not about comparative performance. In explaining the lesson this way those who would normally shy away from athletics participated. There were fewer examples of the competent bystander effect (Tousignant & Siedentop, 1983) than traditional performance based approaches that placed a premium on correct technique.

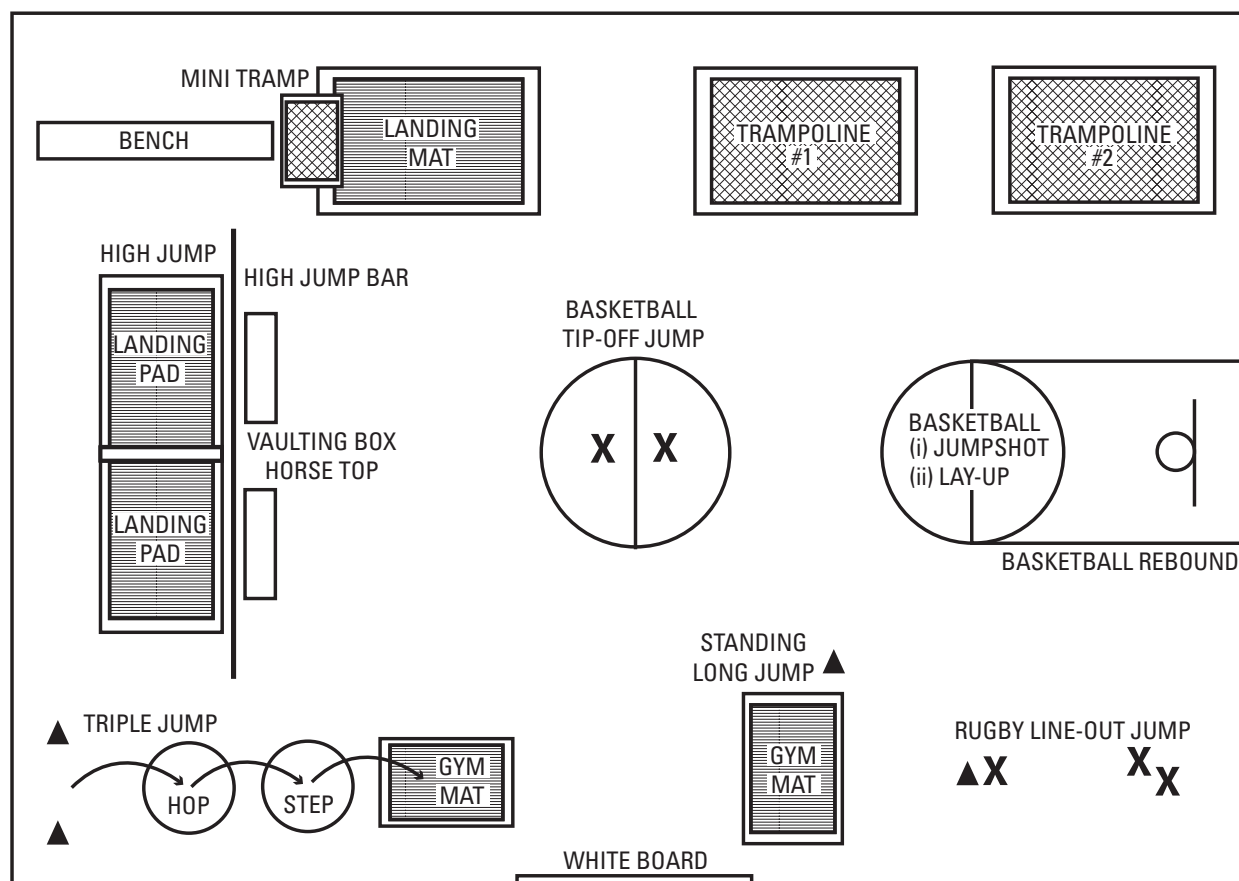
The difference between sport coaching and teaching PE

A recurring argument, still being debated today between PE teachers and sport coaches is the distinction between teaching PE and coaching sport. A discourse on a standard skills-based performance description of athletics is perhaps coaching the sport. However, the discussions and examples above reflect a more holistic and flexible enquiry based approach (Slade, Martin & Webb, 2015) to PE teaching rather than as a coach of athletics.

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GYMNASIUM LAYOUT FOR JUMPING THEME IN AN ENQUIRY APPROACH TO TEACHING ATHLETICS



Adolescent netball players normative data and physical performance profiles

Leanne Taylor and Patrick Lander

Netball is one of the most popular sports in Australasia (Steele, 1990) with one in seven participants in the game being Australian. (McManus, Stevenson, & Finch, 2006). The sport is particularly popular with adolescent females, with the largest participation rates in any sport in New Zealand (Sport New Zealand, 2013) and second largest in Australia (Australian Bureau of Statistics, 2012). The sport's popularity, wide base of participation, and relatively limited national and international representation opportunities, makes netball an ideal sport in which to embed practice of profiling adolescent athletes. Whilst some work has been done to establish profiles for mature elite netball players, there is currently a dearth in the literature demonstrating normative data and physical performance profiles of adolescent netballers at an age-group level.

The dynamic nature of netball requires power and agility in order to accomplish rapid changes in speed, direction, jumping and landing associated with the game. Whilst positional variance may require differing levels of these skills, they are at the core of any netball players' performance profile. Performance attributes can obviously vary as individuals physically mature, and thus it is of interest to compare age-group netballers with normative data in order to assess their potential for progression into elite programmes as they advance through age-group teams. Performance targets exist from Netball New Zealand (NNZ) at the talent development and elite stages (*Netball New Zealand, a*), however, there is currently little evidence of any physical performance profiling or normative data relating to age-group netballers.

Allied to the performance targets are player development guidelines from NNZ based on chronological age from 5 to 21 years onwards (*Netball New Zealand, b*). These development guidelines suggest that to support netball development, non-netball activities such as aerobic/anaerobic conditioning, speed, strength and power, movement competencies and prevention are introduced to players from 13 years of age.

From 16 years of age, player guidelines suggest that one hour of non-netball activities should focus on injury prevention.

Substantial evidence supports the use of specific injury prevention training programmes (*Sadoghi, von Keudell, & Vavken, 2012*) and neuromuscular warm up protocols (*Herman, Barton, Malliaras, & Morrissey, 2012*) to reduce the rate of knee injuries and lower limb injury incidences. This is of particular interest since netball related injuries in adolescents (10-19 year olds) cost the New Zealand Accident Compensation Corporation (ACC) \$6,519,147 in the period July 2015 to June 2016. (*Accident Compensation Corporation, 2017*).

Previous studies have demonstrated the effects of pre-season conditioning programmes (*Abernethy & Bleakley, 2007*) and advocated for balance training and multifaceted training programmes (*Hübscher et al., 2010*), particularly in sports that contain jumping or plyometric exercises targeted at females (*Weber, Lam, & Valovich McLeod, 2016*). Given the potential cost of an adolescent injury to individuals, the sport and the ACC, it is logical to incorporate injury prevention strategies into any player development or performance profiling programme.

Performance profiling of athletes can provide valuable information to players, coaches and netball organisations as a measure of sport progression across age-groups and for talent identification purposes. Studies in sports other than netball, have shown considerable differences across age-groups, however limited studies exist profiling the characteristics of adolescent netballers and physical capacities for particular age-groups. In addition to providing normative data, these profiles could help present early indications for injury prevention and reduce the cost of future injuries. Therefore the aim of this project was to determine profiles of adolescent netballers in New Zealand by age category under 15 years, under 17 years and under 19 years.

METHODS:

Adolescent female netball players from the secondary schools or netball centres across the Netball Central Zone (lower North Island of New Zealand) were assessed across a range of anthropometric and physical tests. Participants were provided with an information booklet prior to testing and all subsequently provided written informed consent; participants under 16 years of age were required to provide

consent from a parent or caregiver. Once consent was obtained, participants completed a baseline questionnaire and testing. Physical testing was conducted in February and March of 2016 occurring during the pre-season of netball competition/s. All participants had yet to begin any pre-season programmes or training for the netball season. One hundred and twelve female netball players between the ages of 12 and 18 years agreed to participate in this study.

Information with regards to the number of netball teams players were involved with as well as the number of training and game hours per week were collected in the baseline questionnaire.

Anthropometric results were recorded for height and weight which were used to calculate body mass index (BMI).

Prior to testing participants performed a standardised five minute warm up. The testing protocol included a five minute warm up, approximately 40 minutes of physical performance testing and a five minute cool down. A rest period of at least three minutes between each physical performance test was provided for all participants.

Performance testing consisted of a combination of strength, power, agility and balance tests along with a functional movement screen. Collectively these tests were considered to give a broad overview of the physical performance characteristics important to success in netball (*Netball New Zealand, a*).

Strength testing involved prone and side holds, press-ups. The prone hold, left and right side holds required the participant to be able to maintain correct alignment and stable body position on the elbows and toes. Participants were asked to position themselves in correct alignment and hold that position for as long as possible. Guidance was provided on correct alignment as required. Time to fatigue was recorded in seconds. In the press up test, participants were asked to complete as many full press-ups as they could. The test ended if the participant could not continue a smooth repetitive movement, their upper body touched the ground or if they could not maintain a stable position. The total number of completed press-ups was recorded.

Power testing comprised of the counter movement jump (CMJ) and broad jump. The CMJ was conducted six times in order to record jump height whilst leading with the left

and right hand. All measurements were taken using the Swift Performance Speed Mat (Swift Performance, Brisbane, Australia) and recorded on the Swift Performance SpeedLight iPad application version 493 (Swift Performance, Brisbane, Australia). Prior to each CMJ each participant was instructed to squat down to a comfortable depth and then to jump reaching as high as they could with the nominated hand. The test was then repeated this using the opposite jump. Each jump was repeated three times with a rest between jumps, making a total of six CMJs, the best jump from each hand was used for data analysis. Jump height was used to calculate a power recording for each jump measured in Watts using a known formula (Harman, Rosenstein, Frykman, Rosenstein, & Kraemer, 1991). In the broad jump, test participants were asked to complete three standing broad jumps from a set position, with the furthest jump distance measured in centimetres used for data analysis.

The Illinois agility test was conducted using Swift Performance SpeedLights (Swift Performance, Brisbane, Australia) and recorded on the Swift SpeedLight iPad application version 493 (Swift Performance, Brisbane, Australia). All participants ran through the agility test for familiarisation. Participants were instructed during the test to ensure correct completion of the course; if a participant missed a turn or knocked over a marker the test ended and the participants were instructed to rest for at least five minutes before re-attempting.

Balance testing required participants to complete two single leg balance tests. Participants were instructed to stand on one leg with the non-stance leg, hip, and knee held at 30 degree hip flexion with arms hanging at their sides. When the participant felt they were balanced they closed their eyes and timing started. Timing ended when the participant either opened their eyes or moved from the balanced position; time in seconds was recorded. Balance on each leg was assessed.

The Functional Movement Screening (FMS) tool was completed using a standardised protocol, which consists of seven activities each with a score of zero (if unable to complete or painful) to three (able to complete activity correctly) producing a potential maximum score of 21 (Minick et al., 2010).

All data analyses were performed using IBM SPSS Statistics software (version 24) (IBM Corp, Released 2016). Descriptive statistics (means and standard deviations) were used to describe the data collected from each age-group. Differences between the groups were determined with either a one way ANOVA (for mean value). The magnitude of differences between age-groups was also assessed for effect size (ES) using Cohen's d. The ES were classified as trivial (≤ 0.19), small ($0.20 - 0.59$), moderate ($0.60 - 1.19$), large ($1.20 - 1.99$), and very large ($2.0 - 4.0$) (Cohen, 1988).

RESULTS:

Data was analysed from 112 participants with a mean age 15.4 ± 1.4 yrs; mean height 1.7 ± 0.1 m; weight 62.0 ± 10.1 kg; and BMI 21.9 ± 3.2 kg/m². The anthropometric and physical activity characteristics within groups of under 15 years of age (U15), 15 to under 17 years of age (U17) and 17 years to under 19 years of age (U19) are shown in Table 1. The body weight altered significantly between the U15 and U17 and U19 comparisons ($p < 0.05$), BMI calculations classified all participants within the normal weight range for adolescents (Ministry of Health, 2014).

No significant differences between groups were found in the volume of training and game time, however a trend of increase in overall netball hours during season within each age-group is clearly apparent. Players in the U15 group played for 1.4 ± 0.6 teams compared to the U17 1.5 ± 0.7 teams and U19 1.7 ± 0.8 teams. The number of trainings per week increased with each age-group, 2.3 ± 1.0 sessions, 2.5 ± 0.8 sessions and 2.8 ± 1.1 sessions respectively. However, the number of games played per week were minimally different 1.6 ± 0.7 games, 1.6 ± 0.5 games and 1.7 ± 0.6 games respectively.

Table 2 provides an overview of performance testing results over the three age-groups. Trends are evident within the groups. Right side hold time was significantly lower in U15 vs U17 and U19 ($p < 0.05$). Right leg static single balance was significantly lower in the U19 age-group when compared with the other two age-groups. Analysis of magnitude of differences shows large to moderate effects of age-group on CMJ power on both right and left side between U15 and U17 age-groups (Cohen's d; 1.2 & 1.0 respectively) but this should be considered in the context of a moderate difference (0.9) in the bodyweight of these two groups.

DISCUSSION:

There is limited data available on the physical characteristics and physical performance capabilities of adolescent female netball players in New Zealand, as such, perhaps the primary outcome of this study is to establish normative for this cohort. The results of comparisons within this study indicate significant differences in the weight between the U15, U17 and U19 age categories with concomitant moderate-large effects as described using Cohen's d. Whilst this is not unexpected, it should be noted the practice of grouping

players in 'under' age categories may result in U15 girls being asked to play against U19 and even U17 players who are significantly heavier. This practice will have implications for performance as well as injury prevention.

Netball New Zealand's player guidelines suggest that U15 age-group should have no more than six hours of netball specific activities, out-of-season. With a further two hours in season of supported activities (*Netball New Zealand, 2017*). At 7.2 ± 4.0 hours per participation a week, in the pre-season phase, the U15 cohort participating in this study were therefore participating slightly greater than the volume expected by NNZ, however the same was not true of the U19 cohort. The U19 age-group are recommended by NNZ to engage in up to 14 hours per week including one hour of injury prevention activities, the cohort in the current study averaged 10.0 ± 6.3 hours per week.

Netball New Zealand advocate that a key milestone in a netball players development occurs at the age of 16 years therefore the U17 age-group falls between the recommendations outlined above, however in the current study only small differences could be found between the netball hours of U15, U17 and U19 age-groups. While the total netball hours across all age-groups investigated were broadly in line with current NNZ player development guidelines, the breakdown of time spent on injury prevention, performance development, training and game time is unclear. It has been determined that the injury incidence for non-elite netball players (18-34 years) is 14 injuries per 1000 player hours (*McManus et al., 2006*). Exposure to increased sporting hours will result in an increased likelihood of injury, consequently understanding player participation levels is essential. The current study only looks at pre-season participation, further investigation is required to explore all activities undertaken by adolescent netball players throughout the year.

Netball New Zealand have outlined minimum physical performance standards for players competing at a NZ secondary school level (U17 to U19 age-group) (*Netball New Zealand, a*). Results from this study show the cohort to be well below the levels expected in measures of strength and power. Press-ups and prone holds were far below the NNZ targets of 15 press-ups and 60-second prone holds (*Netball New Zealand, a*). Side hold strength had a moderate to large difference between the U15 to U19 cohort, which may reflect change in the core strength associated with sideways movement. Whilst the U19 group neared the NNZ prone hold target, little change was seen between the U17 and U19 group. The poor strength measures seen in this study are of concern, particularly as previous authors have linked poor strength to increase in injury prevalence (*Murphy, Connolly, & Beynnon, 2003*).

A similar pattern can be seen in power results. The CMJ and broad jump targets of 40cm and 190cm respectively (*Netball New Zealand, a*) are far superior to the results recorded in this

Table 1: Anthropometric and physical activity data

	U15 (n=39)	U17 (n=57)	U19 (n=16)	U15 vs. U17 Cohen's d	U15 vs. U19 Cohen's d	U17 vs. U19 Cohen's d
Age (years)	13.9 ± 0.7	15.8 ± 0.6	17.5 ± 0.4	3.0	6.5	3.5
Height (m)	1.65 ± 0.1	1.69 ± 0.7	1.72 ± 0.1	0.1	0.9	0.1
Weight (kg)	56.7 ± 7.2 †	64.7 ± 10.6	65.7 ± 9.8	0.9	1.1	0.1
BMI (kg/m ²)	20.7 ± 2.9	22.7 ± 3.5	22.2 ± 2.0	0.6	0.6	0.2
Netball hours during season (hrs/wk)	7.2 ± 4.0	7.9 ± 4.0	10.0 ± 6.3	0.2	0.5	0.4

BMI = Body Mass Index.

† Significantly different between U15 and U17, U19 groups ($p \leq 0.05$)

Table 2: Age-group physical testing characteristics

	U15 (n=39)	U17 (n=57)	U19 (n=16)	U15 vs. U17 Cohen's d	U15 vs. U19 Cohen's d	U17 vs. U19 Cohen's d
Prone hold (s)	35.9 ± 21.4	49.9 ± 40.3	59.4 ± 32.5	0.4	0.9	0.3
R hold (s)	19.5 ± 12.9 †	35.9 ± 21.0	30.8 ± 20.3	0.9	0.7	0.3
L hold (s)	17.6 ± 8.6	32.1 ± 21.9	37.4 ± 18.4	0.9	1.4	0.3
Press up	6.3 ± 6.4	7.8 ± 5.5	7.2 ± 4.9	0.3	0.2	0.1
Single leg balance R (s)	19.5 ± 20.3	20.8 ± 25.2	11.4 ± 9.5 ‡	0.1	0.5	0.5
Single leg balance L (s)	16.5 ± 16.1	15.8 ± 17.3	7.7 ± 6.4	0.1	0.7	0.6
Broad jump (cm)	175.7 ± 18.5	182.0 ± 20.7	169.3 ± 13.4	0.3	0.4	0.7
FMS	10.08 ± 1.48	11.11 ± 2.46	10.06 ± 1.69	0.5	0.01	0.5
CMJ R (cm)	28.0 ± 3.7	29.4 ± 5.0	27.1 ± 4.2	0.3	0.2	0.5
CMJ R power (W)	497.2 ± 168.1	719.1 ± 261.4	684.4 ± 245.5	1.2	0.9	0.1
CMJ L (cm)	27.9 ± 3.6	28.7 ± 4.7	26.3 ± 4.4	0.2	0.4	0.5
CMJ L power (W)	495.9 ± 167.7	705.3 ± 255.8	667.2 ± 248.8	1.0	0.8	0.2
Agility (s)	18.6 ± 0.9	18.8 ± 1.0	19.0 ± 0.5	0.3	0.5	0.2

R = right side. L = left side. FMS = Functional movement screen. CMJ = countermovement jump.

† Significantly different between U15 and U17, U19 groups ($p \leq 0.05$)

‡ Significantly different between U19 and U15, U17 groups ($p \leq 0.05$)

research, indicating that this group of participants is better characterised as a cohort of social and emerging netball players rather than a performance group. Countermovement jump power results showed a large effect between the U15 and U17 cohorts, this was blunted in the U19 cohort. These trends may relate to the increase in weight between the two groups, and may also be an artefact of the smaller group size in the U19 cohort. Interestingly physical athletic measures such as right side hold, press ups, broad and CMJs presented with a mean decrease in comparison of the U19 and U17 age-groups. It could be expected that body power measures would increase with age and response to training interventions such as netball specific training as seen with an

increase in training hours from the U17 to the U19 age-group. However this data indicates while netball hours increase, performance measures are lower in the U19 age-group compared to the U17 cohort.

Profiling of a regional Netball academy in the United Kingdom shows similar trends in the height and weight profiles of U15, U17 and U19 cohorts (Thomas, Ismail, Comfort, Jones, & Dos'Santos, 2012). However the CMJ results shows the lower body muscular strength of the UK athletes to be far superior to the data collected in our trial (Thomas et al., 2012). The contrasting figures indicate a large variation in social or emerging netball players to talent-identified individuals' performance measures.

Netball, due to the nature of the sport, affords high risk for non-contact knee and ankle injuries. Data from ACC shows that claims for netball related injuries for both knees and ankles for 15-19 years old are more costly than those injuries to 10-14 year olds (Accident Compensation Corporation, 2017). Previous authors have suggested that screening adolescent athletes for potential injury risk in netball and providing appropriate programmes should be a high priority given the increasing number of knee and ankle injuries statistics (Simpson, Reid, Ellis, & White, 2015). In agreement, data from this research indicated a high risk of injury with adolescent netball players scoring lowly on the Functional Movement Screen. Previous research has indicated an FMS score <14 was associated with a fourfold increase in risk of lower limb injury in female collegiate athletes (Chorba, Chorba, Bouillon, Overmyer, & Landis, 2010). It could be expected that functional movements such as squatting and lunging would underpin netball skills, however all cohorts in this trial scored poorly in this area of the FMS. Screening tools are fundamental in reducing injuries and need to be further emphasised in the early development of netball players.

It has been suggested that physical education student teachers should be aware of injury prevention guidelines which should include warm-up, functional strength training, core stability and dynamic stability exercises of the lower limbs (Goossens et al.). This research demonstrates that need in adolescent athletes. A solution can be found in the Netball Smart programme currently being implemented by NNZ with the support of ACC, which consists of a neurodynamic warm up protocol, based on the internationally recognised FIFA 11+ warm-up. This Netball Smart programme provides a template for warm-up incorporating athletic development and injury reduction across all age ranges and performance levels. The synergies between Netball Smart, other sporting codes, and ACC SportSmart provide a common shared experience for novice players to elite performers alike to work together to reduce injuries. Netball Smart resources could be easily adopted by physical education teachers and a generation of athletes would become much more accustomed to injury prevention practices from an early age.

CONCLUSION:

This study presents normative data describing the performance characteristics of U15, U17 and U19 netball players, the majority of which were within secondary school age. The findings demonstrate notable differences between U15 compared to U17 and U19 age-groups however those differences were less apparent between U17 and U19 age-groups.

Of concern in the findings were the low scores in a functional movement screen, which provided indications of an increased risk of injury. The application of ACC SportSmart

and Netball Smart programmes could be used to improve FMS scores and better prepare athletes for the dynamic nature of netball. Physical Education teachers have a unique opportunity to change current injury statistics within this cohort, however given the paucity of data in this area it would be worthwhile to continue collecting data in this area given its popularity but also its potential to produce injuries.

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