

Institution: Edge Hill University		
Unit of Assessment: 24		
Title of case study: Improving promotion of children's physical activity in schools		
Period when the underpinning research was undertaken: 2015 to 2018		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Stuart Fairclough	Professor of Physical Activity Education	November 2014 to present
Robert Noonan	Lecturer in Children's Physical Activity	September 2016 to April 2019
Whitney Curry	Senior Lecturer in Children's Physical Activity	September 2015 to September 2017
Bronagh McGrane	Lecturer in Physical Education and Children's Physical Activity	September 2015 to January 2017
Period when the claimed impact occurred: 2016-2020		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact		
<p>This case study summarises the impact of EHU research, focused on children's physical activity promotion in schools. This research involved school students and teachers, undergraduate students, and external delivery organisations. The research led to changes in schools' curricula developments, policies, and practices and enhanced students' and teachers' understanding of key concepts. Moreover, the research led to modification and development of physical activity programmes delivered in schools, which have reflected increased uptake and engagement for the organisations involved. Further, professional development and employability of the undergraduate students who engaged in the projects were enhanced as a result of their participation.</p>		
2. Underpinning research		
<p>The underpinning research was designed and led by the EHU research team in partnership with external organisations between 2015 and 2018. It focused on physical activity interventions, influences of physical activity on health, and methods development.</p> <p>We investigated the effectiveness and acceptability of a commercial school-based physical activity programme developed by Les Mills International (herein referred to as Les Mills) entitled, Born to Move (BTM) through a pilot trial in local primary schools. The BTM sessions were delivered by a Les Mills instructor and complemented existing school-based physical activity opportunities. Significant improvements in students' physical activity and enjoyment were demonstrated for the BTM sessions compared to regular physical education (PE) lessons, and teachers view BTM positively (Sec 3. Ref. 1).</p> <p>Following these positive results, we embarked on developing a larger-scale primary school physical activity intervention. The Active Schools: Skelmersdale (AS:Sk) project was a multicomponent physical activity intervention for primary schools located in a high-deprivation community. Intervention components focused on class time, break times, PE lessons, and</p>		

family-based activities. The intervention demonstrated a significant 9 minutes/day reduction in sedentary time, though changes in physical activity were negligible (Sec 3. Ref. 2), and it was deemed feasible and acceptable by the teachers and students (Sec 3. Ref 3). During the baseline phase of AS:Sk we were the first to apply the compositional data analysis approach to children's device-measured 24-hour movement behaviours. We showed that children's health would be unfavourably affected when health-enhancing physical activity was replaced with sedentary behaviours or light physical activity (Sec 3. Ref. 4). These findings have implications for schools' physical activity policies and practices related to in-class and break-time routines for children, where the recommendation from the data would be to break up prolonged sitting in favour of short periods of moderate-to-vigorous intensity physical activity (MVPA).

The Girls Peer Activity (GPACT) project used a novel university student mentor and peer-leader approach to engage adolescent girls in physical activity. The results demonstrated the effectiveness of the GPACT peer-led mentoring model in increasing girls' physical activity levels when additional after-school activities were made available (Sec 3. Ref. 5). Moreover, the stakeholders involved in GPACT considered it a feasible and acceptable intervention approach to promote physical activity among adolescent girls.

Physical education (PE) teachers are important influences on students' physical activity behaviours but teachers' practice in relation to physical activity engagement is under-researched due to a lack of sensitive and valid measurement methods. An observational tool (SOFIT+) to measure PE teachers' physical activity practices during lessons was developed with secondary school PE teachers (Sec 3. Ref 6). The construct validity of SOFIT+ was tested across 21 PE lessons covering a range of activities and taught by male and female PE teachers. We found that PE teacher practices during PE lessons were significantly related to students' participation in health-enhancing physical activity. SOFIT+ was concluded to be a valid and reliable tool to examine relationships between PE teacher practices and student physical activity during PE.

3. References to the research

1. Fairclough, S. J., McGrane, B., Sanders, G., Taylor, S., Owen, M., & Curry, W. (2016). A non-equivalent group pilot trial of a school-based physical activity and fitness intervention for 10–11 year old English children: Born to Move. *BMC Public Health*, *16*(1), 1-14. doi: 10.1186/s12889-016-3550-7.
2. Taylor, S., Noonan, R., Knowles, Z., Owen, M., McGrane, B., Curry, W., & Fairclough, S. J. (2018). Evaluation of a pilot school-based physical activity clustered randomised controlled trial—Active Schools: Skelmersdale. *International Journal of Environmental Research and Public Health*, *15*(5), doi:10.3390/ijerph15051011.
3. Taylor, S. L., Noonan, R. J., Knowles, Z. R., Owen, M. B., & Fairclough, S. J. (2018). Process evaluation of a pilot multi-component physical activity intervention – active schools: Skelmersdale. *BMC Public Health*, *18*(1), 1383. doi: 10.1186/s12889-018-6272-1.
4. Fairclough, S. J., Dumuid, D., Taylor, S., Curry, W., McGrane, B., Stratton, G., . . . Olds, T. (2017). Fitness, fatness and the reallocation of time between children's daily movement behaviours: an analysis of compositional data. *International Journal of Behavioral Nutrition and Physical Activity*, *14*(1), 64. doi: 10.1186/s12966-017-0521-z.
5. Owen, M., Kerner, C., Taylor, S., Noonan, R., Newson, L., Kosteli, M.-C., . . . Fairclough, S. J. (2018). The feasibility of a novel school peer-led mentoring model to improve the physical activity levels and sedentary time of adolescent girls: The Girls Peer Activity (G-PACT) Project. *Children*, *5*(6), 67. doi: 10.3390/children5060067.

6. Fairclough, S. J., Weaver, R. G., Johnson, S., & Rawlinson, J. (2018). Validation of an observation tool to assess physical activity-promoting physical education lessons in high schools: SOFIT+. *Journal of Science and Medicine in Sport*, 21(5), 495-500. doi: 10.1016/j.jsams.2017.09.186

The quality of the underpinning research is demonstrated by its publication in peer-reviewed scientific journals of international standing, which include physical activity field-leading journals such as the *International Journal of Behavioural Nutrition and Physical Activity*, and the *Journal of Science and Medicine in Sport*. The BTM project resulted from external grant funding from Les Mills (£29,875). The AS:Sk project was externally funded (£27,000) by West Lancashire Sport Partnership (WLSP) and West Lancashire Leisure Trust with additional support from EHU.

4. Details of the impact

The research was undertaken in partnership with Les Mills, which has pioneered physical activity and fitness programmes since 1968 and operates in over 80 countries. The research led to substantial revisions to the Les Mills Born to Move programme tailored for schools. This revised programme is unique in that it caters for early years through to teenagers and can be flexibly tailored by schools to the needs of their students through in-person and virtual delivery formats. BTM and the subsequent projects were undertaken with WLSP, which enabled access to a network of over 60 schools covering the whole West Lancashire area. The research has been applied directly into physical activity programmes and plans through commercial products and educational initiatives.

Modification, development, and adoption of physical activity programmes

The BTM programme was established in New Zealand in 2012 and introduced to the UK with our pilot study in 2015. Our BTM research led directly to Les Mills modifying this established international programme in 2017-18 to make it more accessible and cost-effective. The BTM programme is specifically designed to promote physical activity amongst school age children and operates via a licensing system. The modifications to the programme meant that BTM became available globally emphasising child motivation, differentiated activities, and engagement in MVPA. Key changes to the programme as a result of the research-informed recommendations included the development of an early year's box set allowing educational establishments to purchase the programme for a single fixed fee, simplification of the license fees to make the programme more accessible to schools and adaptations to make the programme more age-appropriate across the range (**Sec 5. Ref .1**). In addition, the research pointed to the need to develop the programme to focus on motivation and ensuring the activity suited the mix of abilities within a child grouping. The Les Mills Head of Research stated, "*Based on the Edge Hill research... we modified the BTM programme by focusing on instructor coaching, specifically, enhancing an intrinsic motivation approach to engage the participants. We adapted our instructor training... emphasising motivational qualities and differentiation of tasks to suit the mixed ability needs of the children*" (**Sec 5. Ref. 2**).

These amendments enabled substantially more children in the UK and internationally to engage with the programme than previously (**Sec 5. Ref. 1 and 2**). The research has also informed Les Mills' wider marketing approaches. The Les Mills Head of Research stated, "*The research findings were important to our marketing strategies in the UK and internationally as*

they demonstrated we were taking an evidence-based approach to our children's programmes, setting us apart from many of our competitors" (Sec 5. Ref. 2).

A significant element of this research partnership was West Lancashire Sport Partnership (WLSP) staff gaining accreditation to deliver BTM, and subsequently WLSP has taught BTM in over 60 primary schools across the region **(Sec 5. Ref 3)**, which further enhances the impact of the research beyond the schools involved in the pilot trial. Moreover, the Director of WLSP commented, *"In light of the Edge Hill research evidence we have modified our programmes to place greater emphasis on health and integration of physical activity into the school day."* **(Sec 5. Ref 3)**. Through funding secured as a result of this research, WLSP also created specialist Health and Wellbeing officer roles in 2017 to service high-quality delivery of physical activity provision across all WLSP primary schools. The Director of the WLSP comments, *"This project has had a sustainable impact across our schools...we used the research findings as evidence to support a grant application to Lancashire County Council, securing £150,000 to deliver a Health and Wellbeing Programme...across the Borough"* **(Sec 5. Ref 3)**.

Changes in schools' curricula, policies, and practices

The Active Schools Skelmersdale (AS:Sk) project was showcased as a model of good practice by the National Children's Bureau (NCB) in their 'Working together to reduce childhood obesity' report **(Sec 5. Ref. 4)** which outlines how research can enhance school-based obesity prevention efforts. The report is available online (<http://bit.ly/31URkQF>) and via the NCB Twitter feed (@ncbtweets). This account has 26,800 followers and tweeted the report several times since 2017, which provided significant reach to access information about our research.

The AS:Sk, Girls Peer Activity (GPACT), and SOFIT+ projects highlighted that research-informed changes to school policies and practices could improve physical activity opportunities and enhance students' leadership potential. Subsequently, schools in West Lancashire have been encouraged by WLSP to adapt PE curricula, professional development activities, and pedagogical strategies to integrate physical activity, health, and wellbeing during lessons and beyond, improving engagement and ultimately children's health and wellbeing in school **(Sec 5. Refs. 3, 5, & 6)**. This is confirmed by the Director of WLSP *"Schools have also adopted key elements and messages from the research projects including increased provision for break time activities through playground supervisors and availability to simple resources, and integration of active classroom breaks into lessons."* **(Sec 5. Ref 3.)**

The changes to curricula and practice have led to greater engagement in physical activities from the pupils involved. As School PE leaders have commented *"We have adapted our PE curriculum to reflect the Edge Hill research findings, specifically emphasising physical activity levels in the activities that are taught. More emphasis is now placed on fitness activities and ensuring that pupils are engaging in activities that involve higher levels of activity more often during the year..."* *"Based on the first Edge Hill research findings we modified our Physical Education lesson planning and delivery by increasing the time spent raising pupils' heart rates and time actively engaged as much as possible"*. **(Sec 5. Ref 5,6)**

Peer-mentoring research led to integration of peer-leadership activities into lesson delivery to improve students' autonomy, confidence, and curriculum 'buy-in' **(Sec 5. Ref. 5)**. The findings prompted schools to take a more inclusive approach to PE programming and student engagement. One Head of PE stated that the research led the staff to *"Looking at the*

preferences and needs of less traditionally 'sporty' girls and focusing on what the girls want has also become a focus of our Department policy and practice" (Sec 5. Ref. 6), while another highlighted how the benefits to the students of participating in the peer-mentoring research extended beyond PE as a subject area (Sec 5. Ref. 5).

Development and employability of undergraduate university students

A distinctive feature of our research is involvement of undergraduate PE students. The GPACT project enhanced the development of undergraduate students who engaged as peer-mentors and research officers. These experiences contributed significantly to employability and subsequent post-degree appointments. Participation in the research led directly to development of communication, interpersonal, and project management skills (e.g., *"By taking part...I was able to have a clear understanding of the planning and organisation that went into completing the project...and put this practice into my own work" (Sec 5. Ref. 7)*). The personal growth and confidence of these students was further enhanced through exposure to varied situations and interactions with different stakeholders. One commented that the project had built her confidence in her subsequent job role when *"liaising with groups of participants, teachers, venues and 'senior teams'" (Sec 5. Ref. 8)*. The research enabled PE undergraduate students to gain experiences over and above those available to them through their programme of study, which enhanced their confidence, organisation, communication, interpersonal skills and subsequent employability.

5. Sources to corroborate the impact

1. Les Mills Global Business Manager testimonial with Facebook screenshot
2. Les Mills Head of Research testimonial
3. West Lancashire Sport Partnership Director testimonial
4. National Children's Bureau report
5. Head of Physical Education (Upholland High School) testimonial
6. Head of Physical Education (Ormskirk School) testimonial
7. Undergraduate student testimonial 1 (Now a physical education teacher)
8. Undergraduate student testimonial 2 (Now a netball development officer)