Highlights and teacher feedback from a study into how the CardioWall can promote physical activity in school and its impact on children's behaviour, effort & concentration in class.

A pair of Rugged Interactive's CardioWall® Compacts were installed in Fowey Primary School, Cornwall in the Spring of 2016. The school ran a 4-week study to identify how effective the 'CardioWall Compact Duo' would be as an addition to more traditional PE activities. Evaluations from teachers and pupil enjoyment were assessed. The trial closely followed the PE guidelines set out by the National Curriculum for Key Stages 1 and 2.

The study included 28 pupils of wide-ranging abilities and aptitudes, with four chosen from each year group (Reception to Year 6). At the end of the trial, the results were reviewed in detail by Rugged Interactive's Sports Scientist, Lucy Manley. Fowey School Head of PE, Pippa Counter summarises and comments on the findings of this study (quoted throughout).

The trial proved a huge success. Fowey Primary School subsequently purchased a pair of Compact CardioWalls and continues to use them widely across the school.

SUMMARY

Study Objectives

The trial looked at five key areas:

- The **breadth of appeal** (by year group, gender, ability and attitude to physical activity)
- The **physical benefits**
- **Personal and social and benefits**
- The impact on **concentration and behaviour in class**
- The teachers' own response to the CardioWalls.

Headline Findings

The CardioWalls have proved universally popular with both pupils and staff at Fowey Primary School. Rated **as considerably more enjoyable than traditional PE lessons,** and **equally appealing to all groups** including non-sporty types, reluctant exercisers and normally disruptive pupils. The CardioWalls also had a dramatically positive effect on behaviour: teachers found that **pupils' concentration in class and effort with academic studies were significantly improved** over the course of the trial when using the CardioWall during school.

The equipment was found to be valuable, **not just in PE lessons but also in a wide range of extra-curricular activities,** including sports clubs such as cricket and netball, and 1-on-1 sessions for children with special needs.

STUDY DETAILS

About the Study

- 28 pupils from Fowey Primary School were included in the study (13 boys and 15 girls) from Reception (age 4 years) through to Year 6 (age 11 years)
- The form teacher from each year group was asked to evaluate each of their four pupils across the course of the trial
- Pre and post-trial measurements were taken to determine how the CardioWalls impacted on children's behaviour and concentration in class
- The form teacher for each year group evaluated the suitability, effect and benefits of using the CardioWall in school
- Pupils also completed an evaluation sheet assessing their enjoyment of using the equipment and the impact it made.

Relevance to the Curriculum

As children spend a significant proportion of their day in school, it provides the ideal setting to encourage children to meet the recommended government guidelines of 60 minutes of moderate to vigorous physical activity a day. Key Stages 1 and 2 of the National Curriculum for Physical Education focus on the development of fundamental motor skills and engagement in competitive and co-operative physical activity. By combining different movement patterns and equipment (e.g. basketballs and soft-weights), the CardioWall can be used to improve, train and test a range of physical skills whilst mentally challenging users.

Role of the CardioWall®

The CardioWall is based on the concept of *gamification*; making everyday activities into competitive, fun events. Gamification has shown to have positive effects on a player's motivation to exercise, energy expenditure,

social interaction and cognitive performance. The CardioWall has a variety of game programs, each testing one of speed, stamina and reaction time whilst also providing a mental challenge. Previous studies have shown the CardioWall increases energy expenditure, motivates players to exercise, and encourages social interaction and teamwork. Additionally, the CardioWall is also effective at improving basic movements, strength, agility and coordination.

FINDINGS

Breadth of Appeal

"CardioWalls are different to any other activity the children have encountered and so even 'sporty' children enjoy the challenge. For those who don't enjoy team activities or complete at a lower level, they can compete against themselves and try to beat their own score."

Teachers rated the CardioWalls very highly for the way in which they appeal to a very wide range of different users.

- **Ease of Use:** Described by teachers as being "simple to use", children could also "use the CardioWall alone without adult support" and "all children [seemed] excited to use the CardioWalls".

- **Appeal to 'reluctant exercisers' and the non-sporty:** Notably the least enthusiastic PE participants were identified as being able to particularly benefit from their CardioWall sessions. This was flagged as a major attraction.

"Those children who were not so confident during PE lessons felt they could confidently complete the challenges without fear of failure. No-one was left out or felt pressured by their peers as the whole team completed the same task. This is particularly important when classes have a wide range of abilities."

- **Builds engagement:** Rated by teachers as very effective in its appeal to children (average rating 9.3 / 10).

"For those children who were only used to flashing lights and computer games it definitely enthused them. I chose two children in Year 1 to take part in the study and both were more enthused with PE after the study."

- **'More enjoyable than normal PE':** Pupils rated their enjoyment of using the CardioWall in school as 18% greater on average than traditional PE lessons. Enjoyment was shown to remain significantly high across the duration of the trial; see **Figure 1.**

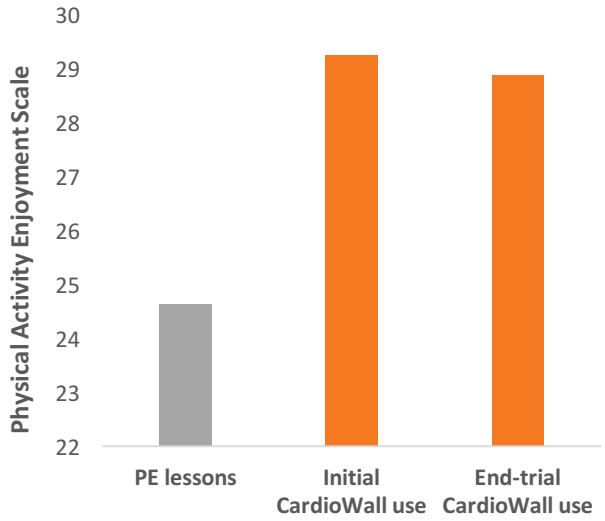

Figure 1: Pupil comparison of PE and CardioWall use over the course of the trial. Evaluated using the Physical Activity Enjoyment Scale *(PACES; adapted from Moore et al., 2009)*

- **Appealing to teachers:** Teachers reported that the CardioWalls required low supervision (could be used alone without adult support) and that all children were quick to pick-up how to operate each game.

- **Versatility:** The popularity of the CardioWalls went well beyond the classroom. Teachers quickly saw a range of other activities for which they will prove valuable.

"The CardioWalls will be used for further sessions, including 'Wake and Shake', Netball and Cricket clubs, and for 1:1 activities with children with special needs"

Physical Benefits

- The Year 1 form teacher stated that the CardioWall particularly supports the build-up of skills including "mobility", "balance", "multi-skills" and "gross motor control".

Overall, the CardioWalls were rated **very effective** (average rating: 8.5 / 10) as an **additional / alternative method of physical education.**

"For KS1, during PE lessons, children learn spatial awareness, increase their mobility and body awareness and improve their hand-eye coordination skills. CardioWalls help children hone these skills/objectives in a fun, interactive environment."

Personal and Social Development

- **Confidence building:** When comparing pre and post-trial measures:

"Those children who were not so confident during PE lessons felt they could confidently complete the challenges without fear of failure."

- **Inclusiveness:**

"No-one was left out or felt pressured by their peers as the whole team completed the same task. This is particularly important when classes have a wide range of abilities."

- **Behaviour and concentration in class:** When asked which children could benefit the most from having CardioWalls in school - girls, overweight/de-conditioned, reluctant exercisers, disruptive pupils,

sporty types, unconfident/shy were all identified as target groups. Additionally, it was reported that:

"…the reluctant exercisers/unconfident children [will] make the most gains over a short space of time."

Pupils also recorded their scores across the 4 weeks for three CardioWall games: *ClearOut, Chaser* and *ClusterShot.* Scores for each of these games increased substantially over the 4-weeks – **showing that motivation to play and beat previous high scores by pupils remained consistently high.** See **Figure 2.**

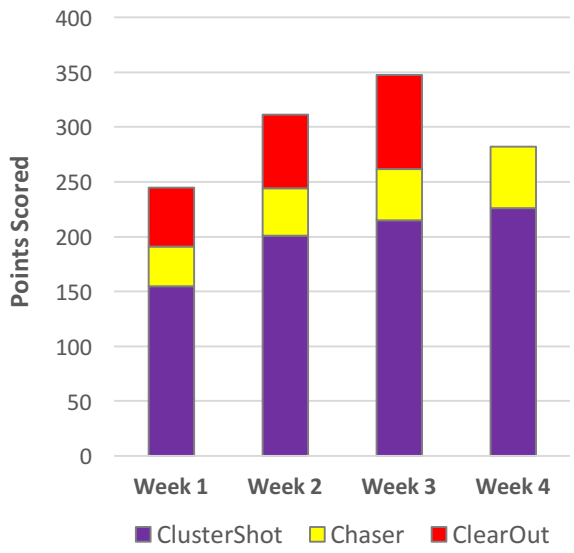

Figure 2: Average points scored by pupils on the CardioWall when playing *ClearOut, Chaser and ClusterShot for 1 minute.* Changes in scores displayed from week 1 to week 4 (*ClusterShot/Chaser*) and week 1 to week 3 (*ClearOut)*.

CONCLUSIONS

Findings

The CardioWall proved to be a highly motivational and enjoyable exercise tool that is time-efficient and easy to use for teachers and pupils in school.

Teachers reported that the CardioWall was **highly effective**:

- **at appealing to children**
- **at appealing to teachers**
- **as an additional/alternative method of physical education**
- **for extra-curricular activities**
- **for suitability across year groups**

Use of the CardioWall was also found to improve concentration and behaviour in class, was judged suitable and beneficial, in line with the National Curriculum for PE, and had positive effects on academic performance.

The findings highlighted that teachers using the CardioWall found it exceeded their high expectations, as an addition or alternative to traditional PE lessons. Children benefited both physically and psychologically. Overall, the CardioWalls are a positive addition to PE lessons and the potential benefits for school children are extensive.

Outcomes of the Study

The CardioWalls have now been installed permanently in Fowey Primary School to be used as an addition to PE lessons and for extra-curricular activities.

Head of PE, Pippa Counter, was delighted by the impact of the CardioWalls:

"The CardioWall Compact Duo has added a new dimension to PE at Fowey Primary. What makes the CardioWalls particularly effective is their accessibility – every child of every ability and age can enjoy using them. They are not only used during lessons but utilised by extra-curricular clubs including breakfast club. CardioWalls and Wake & Shake... a great way for children to be ready to learn at the start of the day!"

References

Moore, J. B., Yin, Z., Hanes, J., Duda, J., Gutin, B. and Barbeau, P. (2009). Measuring enjoyment of physical activity in children: validation of the Physical Activity Enjoyment Scale. *Journal of Applied Sport Psychology,* 21 (S1), pp. 116-129.

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