Development of Virtual Traveller: A behaviour change intervention to increase physical activity during primary school lessons

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Childhood obesity in UK

1.0% Underweight
9.1% Normal weight
12.8% Overweight
77.2% Obese

BMI status at Reception (4-5 years)

1.4% Underweight
19.1% Normal weight
14.2% Overweight
65.3% Obese

BMI status at Year 6 (10-11 years)

The Health and Social Information Centre, 2015
WHO & NHS recommend:
• 60 minutes or more of moderate or vigorous physical activity (MVPA) a day
• Minimise sedentary time

Proportion of children aged 5-15 meeting physical activity recommendations, by age and sex

Scholes & Mindell, 2013       N=2043
2012 Health Survey for England data
Physically active lessons

- Integrating movement into teacher-led educational content

- Jumping along when counting times tables....
- Acting out movements in a story...
- Making graphs from movements (e.g. heart rate)
- Learning dance of a studied country...

(Norris et al. 2015, *Prev Med*)
Virtual Field Trips (VFTs)

>70% UK classrooms have interactive whiteboards

(未来的Source Consulting, 2010)

Use movements to explore the world and learn....

• Short sessions or whole lesson
• Use movements to travel between and interact with locations
• Curriculum-relevant content
Pilot one-off VFT sessions  
- \( n = 40 \) active VFT, \( n = 45 \) sedentary VFT – Olympic themed
- Reduced sedentary time (\( p < 0.001 \)), increase light (\( p < 0.001 \)), moderate (\( p = 0.02 \)) and vigorous time (\( p = 0.001 \))

Qualitative work
- \( n = 12 \) teacher interviews & \( n = 18 \) (\( k = 3 \)) pupil focus groups

**Facilitators**
- PA Lessons as increasingly common
- VFTs as flexible teaching tools
- Encourage inclusive learning

**Barriers**
- Resistance to technology in some teachers
- Need to be ready-made
- Behaviour management

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Norris et al. 2015; BMC Pub Health

Norris et al. 2015; BMC Res Notes
Virtual Traveller intervention

Pilot Cluster-randomised controlled trial with waiting list control

- 6 week intervention
  - 10- minute sessions 3x a week
  - Year 4 classes (8-9 years)
  - Maths & English National Curriculum
    - Developed with two teachers

- Measurements taken pre, during and post-intervention
  - Physical activity, On-task behaviour, Student engagement
  - 3 month follow-up

- Process evaluation of intervention
### Examples of Behaviour Change Elements

<table>
<thead>
<tr>
<th>Taxonomy Category</th>
<th>BCTs</th>
<th>Example in Virtual Traveller intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During teacher training</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Natural consequences</td>
<td>5.1 Information about health consequences</td>
<td>Included previous research showing effects of extended sitting on pupil’s health, wellbeing and educational outcomes</td>
</tr>
<tr>
<td>2. Comparison of behaviour</td>
<td>6.3 Information about others’ approval</td>
<td>Shared anonymous pupil and teacher feedback from VFT feasibility work</td>
</tr>
<tr>
<td>3. Goals and planning</td>
<td>1.4 Action planning</td>
<td>Planned where to fit 3 Virtual Traveller sessions a week in Maths and English lessons with teacher</td>
</tr>
<tr>
<td><strong>During intervention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Associations</td>
<td>7.1 Prompts/Cues</td>
<td>Placed teacher log by teacher’s computer as reminder to do Virtual Traveller sessions</td>
</tr>
<tr>
<td>5. Goals and planning</td>
<td>1.1 Goal setting (behaviour)</td>
<td>Teachers agreed to aim to teach three Virtual Traveller sessions a week within Maths and English lessons during the intervention</td>
</tr>
<tr>
<td>6. Reward and threat</td>
<td>10.2 Material reward</td>
<td>Competition within each class at each assessment phase and overall for pupil who wore belt the longest</td>
</tr>
</tbody>
</table>
Virtual Traveller Programme

**English**

E1: Kung Fu Punctuation 1
E2: Kung Fu Punctuation 2
E3: Explanation Texts
E4: English True or False
E5: Mystery Monsters
E6: Noun Reverse Charades
E7: Persuasive Writing
E8: Frozen Vocabulary
E9: Diary Discovery

**Maths**

M1: Tens and Hundreds Challenge
M2: Maths Marching
M3: Maths True or False
M4: London 2012 Olympics
M5: Metric Movements
M6: Sports Galore
M7: Rock around the Clock
M8: Money, Money, Money!
M9: Global Dance Count
Thank you for listening

Project references to date:

Thanks to participating schools, teachers and pupils & funders UCL Crucible

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Example: M2 Maths Marching VFT

Welcome screen
Global journey of Maths Marching

Maths Marching

Today we’ll be practicing times tables to marching beats and movements.
You will train and work towards performing at the Trooping of the Colour - the Queens’ birthday celebrations.

‘Training’ in London
Practice times tables to marching song

Training

Let’s start our training by practicing a times table of your teachers’ choice.
March and practice saying the times table out loud to the beat! e.g. $1 \times 3 = 3$, $2 \times 3 = 6$.
Don’t forget to start with a salute!

Blast into space

Space Blast Off!

To get to the final challenge of Maths Marching, we’ve got to travel to deep space.
Shake your body from head to toe as we blast off!

Challenge Darth Vader to a tables table challenge

Challenge: Outer Space

For your final performance you are marching for the evil Darth Vader in outer space! Make sure you got the moves right!
Your teacher will choose a times table for you to say out loud. Your teacher will also shout out commands for you to follow at the same time e.g. turn left/right.
Athletic events were held at the Olympic Stadium during the 2012 London Olympic Games.

Let's run the men's 100m final with Usain Bolt.

Q: Was the World Record broken during this race?
Potential Future VFT Work

- Different age groups
- Other subjects
- SEN Children
- Google Expeditions