

Using Dr Kawashima's brain training in primary classrooms: a randomised controlled study. A summary for the BBC.

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Background

There is a growing acceptance of the value of ICT in primary schools, with a range of applications now embedded in mainstream practice. In recent years initiatives have included the use of laptops, interactive white boards, hand-held computers and the internet. Additionally, there has long been an interest in the use of games-based applications in the classroom, with a growing interest in the potential of commercial off-the-shelf computer games (COTS) for learning in schools. The arguments for such games are framed in terms of knowledge gains, skill development, motivational aspects and cultural relevance issues (see, for example, Prensky, 2001a; Kirriemuir & McFarlane, 2002; Sandford, Ulicsak, Facer & Rudd, 2006). However, as yet, the evidence of their educational value is neither extensive nor robust (Condie & Munro, 2007). In fact, in the current educational literature, much that has been written about the benefits of games and games-based learning appears to focus on the beliefs and attitudes of teachers, pupils and parents (eg McFarlane, Sparrowhawk & Heald, 2002; Facer, 2005; Sandford et al., 2006). There is a notable absence of studies that report output measures in terms of attainment.

Current study

This randomised controlled trial (RCT) follows on from a small-scale case study (Miller & Robertson, under review). In that study, we found statistically significant improvements in computation (accuracy and speed of processing) and self-perceptions when children used a COTS programme on a games console (*Dr. Kawashima's brain training*) over a ten-week treatment period.

The design of the current trial involved identifying schools which were in the lowest quartile in terms of socio-economic status (as measured by entitlement to free school meals) in each of the participating Regional Education Authorities. Once the pool of schools had been identified in each authority, they were randomly assigned to the experimental or control group. Each school in the experimental group was given a set of Nintendo DS lite games consoles for a primary 6 class.

Participants

- 32 schools
- 4 local authorities
- Complete data for 634 P6 children

Method

- Randomised controlled trial (stratified random sample)
- There were 2 conditions:

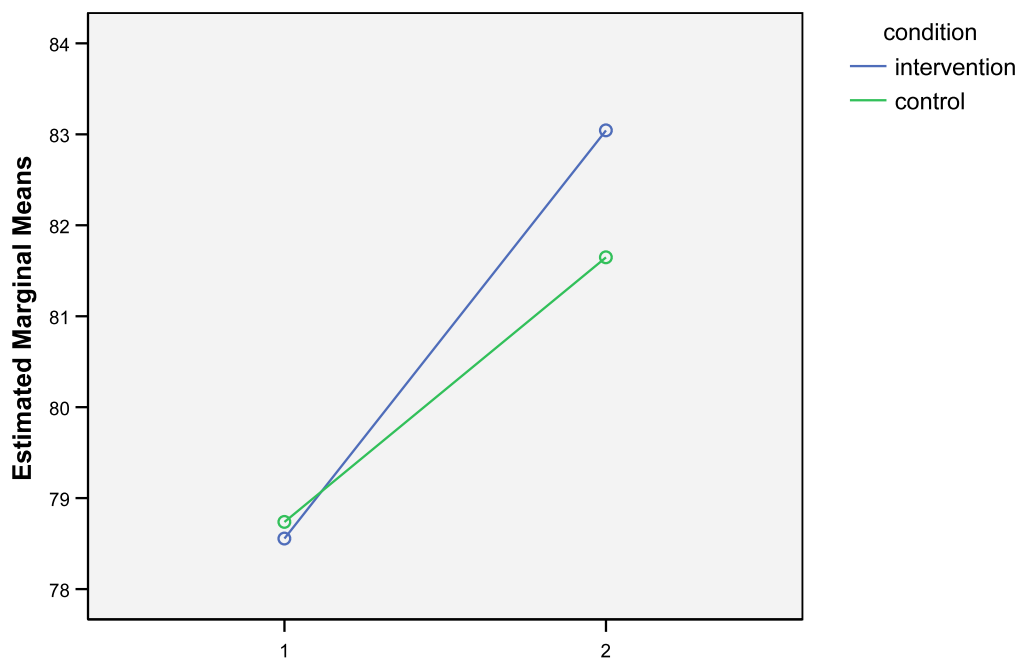
- Experimental group, who used the Nintendo half an hour a day, 5 days a week playing *Dr. Kawashima's brain training*
- A control group, where the teachers were asked not to change their normal routine
- A training session was provided for the teachers who were in the Nintendo group
- The treatment period was 9 weeks
- Data collected: pre and post measures of computation (accuracy and speed), various self-measures, (eg mathematics self-concept). In addition, other data were collected: eg children's previous performance against national standards (5-14 levels); computer use at home.

Findings

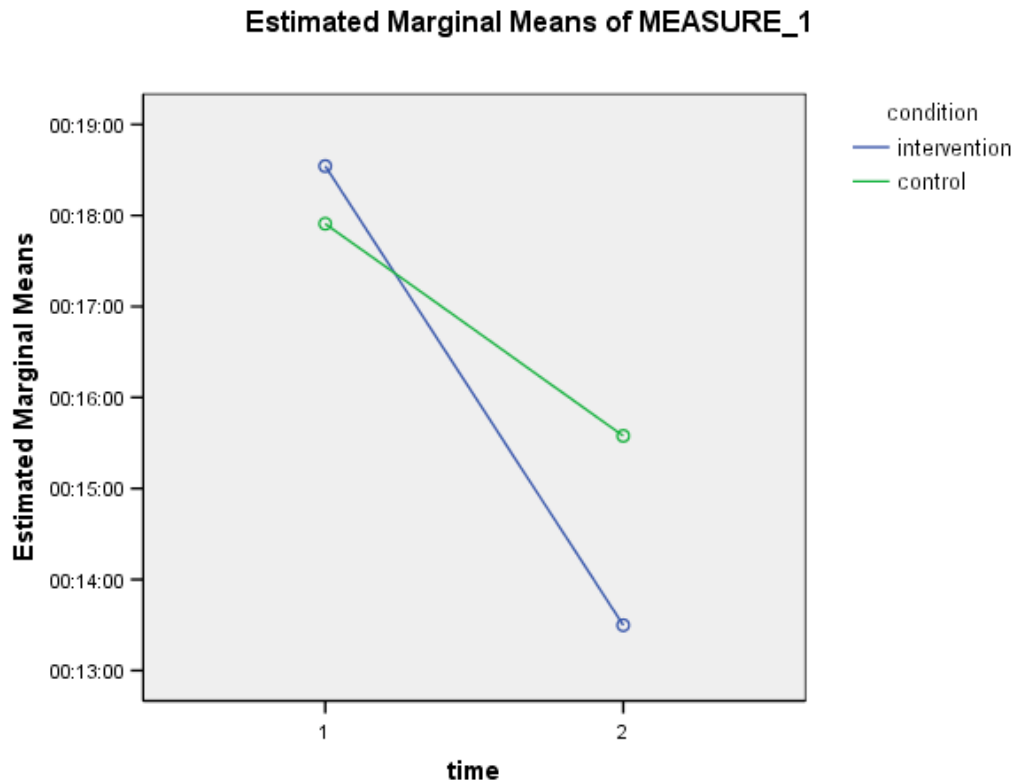
1. Accuracy (number correct)

- Statistically significant gains in both groups.
- But the mean gain in the experimental group was approximately 50% greater than that of the control group. This difference was statistically significant.

Estimated Marginal Means of MEASURE_1



2. Speed of processing (time taken to complete number test)
 - Statistically significant improvement in both groups.
 - However, the mean improvement in the experimental group was more than twice that of the control group. This difference was highly statistically significant.



3. Self-concept
 - No significant change in either maths self-concept or academic self-concept in either group.
4. Attitude to school
 - Slight – but statistically significant – improvement in attitude towards school in the experimental group, but not in controls
5. Analysis by previously recorded mathematical ability (general trends – more detailed analysis to follow)
 - In terms of number correct, the less competent children tended to improve more than the more able children.
 - In terms of speed, the majority of children in the middle of the ability range improved more than the children at the top and bottom
6. Gender:
 - There were no significant gender differences.

Further comments

In addition to the quantitative data collected, we also noted comments from teachers and children after the treatment period was over. Further qualitative data will be reported in due course, but some interesting findings included:

- improvements noticed in children’s academic work: tables, basic computation, writing

- truanting and lateness had dramatically improved in some classes (the Nintendos were used at the start of the school day)
- children keen to take responsibility for the management aspects (collection, distribution, charging etc)
- improvements in interpersonal relationships (children taking a supportive interest in the performance of peers)
- children believed that they were ‘smarter’ as a result of using the game

Final comments

There are many implications here: for the use of COTS in classrooms, for the raising attainment agenda, for teaching and learning styles, for further investigation of the domains of learning, for the management of electronic resources once purchased, for teachers’ belief systems, and a range of other issues. These will be developed in more detail in our academic papers. At this point we would like to make two concluding remarks.

1. When interesting educational innovations appear, or new and exciting equipment becomes available, these are occasionally (but not always) trialled in schools. However, this evaluation process is rarely rigorous. For example, ‘good’ schools and/or enthusiastic or ambitious teachers are often targeted to trial materials or equipment. ‘Hard data’ are not always collected. Comparison groups are rarely – if ever – employed. From the point of view of objectivity and generalisability, the dangers of such an approach are obvious. This becomes a real issue when one begins to comprehend the spending nation-wide on new curriculum materials and resources.

We believe that the value of this RCT is that it supplies us with objective data, and provides a realistic picture of the results we might expect to see across the primary school population in Scotland.

2. Finally, we wish to emphasise that the funding for this study was provided mainly by Learning and Teaching Scotland, (a non-departmental public body funded by the Scottish Government) with one of the participating Local Education Authorities contributing to the cost in order to spread the use of these resources in their authority. The authors neither asked for, nor received, financial or any other form of support from Nintendo or any other commercial organisation.

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