THE CAMPBELL COLLABORATION

Title Registration for a Systematic Review: Free Provision of Information and Communications Technology (ICT) for Improving Academic Achievement and School Engagement in Students Aged 4-18: A Systematic Review

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Submitted to the Coordinating Group of:

☐	Crime and Justice
☒	Education
	☐ Disability
☐	International Development
	☐ Nutrition
☐	Social Welfare
☐	Other:

Plans to co-register:

☒	No		
☐	Yes	☐ Cochrane	☐ Other
☐	Maybe		

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TITLE OF THE REVIEW

Free Provision of Information and Communications Technology (ICT) for Improving Academic Achievement and School Engagement in Students Aged 4-18: A Systematic Review

BACKGROUND

Improving educational attainment continues to be an ongoing aim for education policies across the OECD member countries, further brought into focus by the international comparison league tables published by this organisation (OECD, 2010). From a national policy perspective, improving educational outcomes for young people is seen as important for a country's future competitiveness in the international market, for social policies aiming to reduce social inequalities, and as an essential element in school standards development. For local policies, it is the most important competitive tool for schools who want to attract keen families and students to their education community. Finally, and perhaps most importantly, it is imperative to young people themselves, whose chances of employment and economic independency hinges on their success and engagement at school.

Schools have long been providing information and communications technology (ICT) to pupils, as means to introduce students to the use of ICT, to enhance their learning experiences in other subjects, and as an advertising tool to attract the most eligible students. Increasingly, as ICT equipment becomes more affordable, some schools are purchasing ICT in order to improve students' attainment, for example by providing each student with a tablet, offering reduced-rate internet subscription or by ICT-immersion programmes, which embed all classrooms with communications technology and computers. Often these programmes are particularly focused on reaching out to pupils who are under-achieving or who are at a social disadvantage that reduces their ability to obtain ICT privately.

Due to the fast developments in ICT, public institutions will always be behind in terms of what kind of technology they can afford to offer their students. There is potential for vast spending on ICT, and it is imperative for teachers, education policy makers, and local planners to know whether and how money spent will impact on the learning of pupils who receive it.

This review aims to identify studies that have evaluated the impact of ICT immersion programmes and programmes that have provided ICT equipment to students aged 4-18. The outcomes of interest will be attainment in core subjects: maths, science, reading, writing, history and languages, and impact on students' engagement in school. If a study contains cost information, this will be collected and considered for a cost-effectiveness estimate. While the main aim of the review is to consider impact on all students within the specified age range, the review will consider the impact on socially disadvantaged students in particular.

OBJECTIVES

This review aims to address the following questions:

- What impact do ICT interventions have on the attainment and school engagement of students aged 4-18?

- What impact do ICT interventions have on the attainment and school engagement of socially disadvantaged students aged 4-18?

EXISTING REVIEWS

We are unaware of any existing systematic review on this topic. A rapid evidence review "Providing ICT for socially disadvantaged students" was published in 2012 (Liabo, Simon, & Nutt, 2013). The proposed Campbell review will update and expand on this.

INTERVENTION

Eligible interventions will be ICT interventions aimed at students to use in their learning and include:

- Free or discounted provision of laptops, tablets, internet subscriptions, or other ICT equipment to students at school, home, or community.

- ICT immersion programmes: a whole school approach to technology including computer access in every or most classrooms, Wi-Fi, and an emphasis on ICT within the school environment and for use by the students in their learning. To be included, programmes will have had to be longer than three months and with the aim of creating a lasting ICT legacy for pupils attending the school.

Comparisons can be "no intervention," another type of intervention to improve attainment, or comparisons between different kinds of ICT programmes.

Excluded will be programmes that have implemented ICT for teachers, such as interactive whiteboards or online teaching planning. Also excluded will be the effect of online learning programmes, such as Mathletics.

POPULATION

To be included, a study must have considered the academic impact on children who are in compulsory education, at elementary/primary level or high/secondary level—hence a focus on ages 4-18, which cover the age of compulsory schooling in a majority of OECD countries.

This review will only include studies carried out in OECD/high or high-middle income countries (exact parameters to be confirmed). This is because there is considerable difference in ICT access and availability between high-income countries and those of lower-middle income, and because the policy aims of introducing ICT in schools are likely to vary across very different socio-economic settings.

Where available, information on socially disadvantaged students will be reviewed with the aim to ascertain impact for this particular group. By social disadvantage we refer to students who meet the EU social inclusion indicator of relative poverty (60% or less of the median income[1]) or those eligible for free or reduced priced school meals. Also included will be pupils who are characterised as having low socio-economic status, and those where multiple factors indicate social disadvantage, most notably living in a poor area with a low household income and with parents without higher education. Pupils characterised by living in foster or residential care will be included, as this indicates a clear social disadvantage.

The review will not cover studies that have considered impact on young people in higher-education colleges, or other types of education that is not compulsory. Also excluded will be studies on interventions in special educational settings, such as pupil referral units or juvenile prisons.

This review will not include studies on students who have special educational needs, or who have been excluded from school on the basis of their behaviour.

OUTCOMES

Primary outcomes

- Student attainment, as measured by literacy, numeracy, or knowledge, in written or oral tests.

- Student engagement with school, as measured in interviews or surveys, attendance patterns, exclusion numbers, or other indicators on school enjoyment.

Secondary outcome

- Impact on attainment and engagement in socially disadvantaged students.

Information on cost will be collected for all studies where available. At the end of data extraction, an assessment of this data will inform a decision on whether there is enough quality data to conduct a cost benefit analysis.

[1]http://epp.eurostat.ec.europa.eu/portal/page/portal/conferences/documents/34th_ceies_seminar_documents/34th%20CEIES%20Seminar/1.1%20%20I.%20MARX.PDF

Excluded outcomes

- Students' self-reported achievement levels or test results.

STUDY DESIGNS

Included study designs:

a) To assess the impact of ICT interventions on pupils' academic achievement, the following study designs will be included. The designs are listed in order of quality:

   - Cluster randomised controlled trials: a comparison between schools offering free or reduced cost ICT and those who were not, and where the school allocation to the intervention group and the comparison group was random. The advantage of cluster randomisation is that it controls for contamination between individuals within the same setting.

   - Non-randomised controlled trials: a comparison between schools as above, but without random allocation.

   - Within-school random allocation to groups: a comparison between students within one school who received free or discounted ICT and those in the same school who did not.

   - Within-school comparison studies: as above but without the random allocation to groups.

   - Before-after studies: comparing results from the intervention period with previous periods in the same setting—for example, looking at in-school variation by year considering academic results or engagement levels before the introduction of ICT provision and after.

   - Studies where the intervention results are considered along another setting: a comparison study between those subjected to free or reduced cost ICT and a group that is not similar to the intervention group.

b) The above list of study designs will also guide the assessment of the impact on school engagement. However, in addition we will include:

   - Qualitative interviews and surveys asking students about their views on the role of ICT in their education, including satisfaction surveys and ethnographic interviews.

Excluded study designs

Qualitative observations or ethnographies that have not interviewed students about their views.

REFERENCES

Liabo, K., Simon, A., & Nutt, J. (2013). *Providing ICT for socially disadvantaged students: Technical paper*. Reading, Berkshire: CfBT Education Trust.

OECD. (2010). *PISA 2009 Results: What students know and can do. Student performance in reading, mathematics and science (Volume 1)*. Retrieved from http://dx.doi.org/10.1787/9789264091450-en

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ROLES AND RESPONSIBILITIES

Please give a brief description of content and methodological expertise within the review team. It is recommended to have at least one person on the review team who has content expertise, at least one person who has methodological expertise and at least one person who has statistical expertise. It is also recommended to have one person with information retrieval expertise. Please note that this is the *recommended optimal* review team composition.

- Content: Kathy-Ann Daniel-Gittens
- Systematic review methods: Kristin Liabo and Jan Tripney
- Statistical analysis: Antonia Simon
- Information retrieval: Kristin Liabo

POTENTIAL CONFLICTS OF INTEREST

Two of the authors (A Simon and K Liabo) are co-authors of a published rapid review on this topic. With A Elwick they have also published a perspectives paper based on that review.

FUNDING

We plan to approach potential funders in government and industry. CfBT Education Trust, which funded our rapid review, has agreed that their research officer A Elwick can have some allocated time to work on the full Campbell Review.

PRELIMINARY TIMEFRAME

Note, if the protocol or review are not submitted within 6 months and 18 months of title registration, respectively, the review area is opened up for other authors.

- Date you plan to submit a draft protocol: 1st of June 2014
- Date you plan to submit a draft review: 1st of June 2015

DECLARATION

Authors' responsibilities

By completing this form, you accept responsibility for preparing, maintaining, and updating the review in accordance with Campbell Collaboration policy. The Coordinating Group will provide as much support as possible to assist with the preparation of the review.

A draft protocol must be submitted to the Coordinating Group within one year of title acceptance. If drafts are not submitted before the agreed deadlines, or if we are unable to contact you for an extended period, the Coordinating Group has the right to de-register the title or transfer the title to alternative authors. The Coordinating Group also has the right to de-register or transfer the title if it does not meet the standards of the Coordinating Group and/or the Campbell Collaboration.

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Form completed by: Kristin Liabo **Date: 6 December 2013**