TRANSLATIONAL RESEARCH INSIGHTS

Editorial by Dr. Nadia Siddiqui

Synthesising and translating evidence for use in education took a major step forward when the Sutton Trust and Education Endowment Foundation first published their Teaching and Learning Toolkit in 2011. This TRI issue is a contribution from Professor Steve Higgins, the lead author of the Toolkit, discussing the purpose and challenges of evidence synthesis, and the early achievements of the Toolkit project in advancing the evidence base for school education.

Research evidence and professional experience

Prof. Steve Higgins, Durham University

Research and Experience

Researchers and practitioners are necessarily interested in different things. Researchers want answers to general questions about what is effective and seek to develop theories or models which can be applied across contexts. Practitioners are interested in how to meet the needs of their learners and the influence of the contexts and the relationships which the researchers have often pushed to the background. I don't think that this mean that these perspectives are incompatible. We just need to understand the role of each in contributing to effective teaching and learning.

In terms of research, single studies are not enough in education. There is too much variation between contexts and settings, between schools, teachers and pupils, as well as the in application of educational concepts and ideas to be confident of the findings from a single study, no matter how robustly designed, implemented and analysed. A single study can be interesting, but never conclusive. A cumulative and comparative approach is therefore an essential tool in making progress in education research and to prevent the pendulum of policy changes or public opinion swinging backwards and forwards each decade. This is one of the reasons why I developed the EEF Teaching and Learning Toolkit. This aims to be a source of information about research evidence to inform decision making in schools. It summarises existing meta-analyses of research. These are reviews which combine the quantitative findings from research studies to provide an overall estimate of the average or typical effects of a particular intervention or approach. The Toolkit aims to provide an overview of the cost and benefit of different educational interventions and approaches.

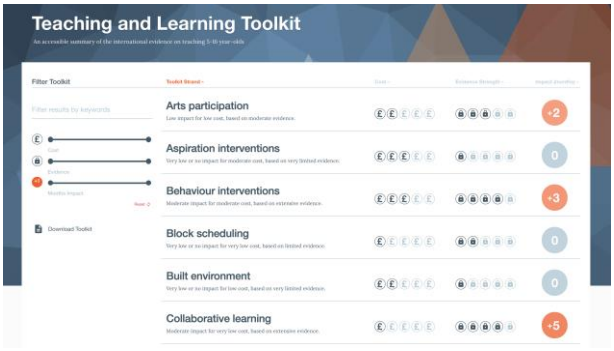

Figure 1: The Teaching and Learning Toolkit

https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit

Meta-analysis offers us the best way to get an overview of research findings in a specific area of educational practice, such as phonics, for example. Such research can also to inform our understanding of literacy more broadly, by looking across the meta-analyses of phonics and reading comprehension or other areas of intervention research in reading. Understanding the relative value of different teaching and learning approaches, such as collaborative learning or the contribution of digital technologies, can help set findings from different areas of research in perspective. This kind of synthesis of research provides a map of the field. It may not provide us with a route map or a set of directions for a particular journey, because these are dependent upon the precise starting point and destination we have in mind. However, this map can help orient us as we focus in on a particular educational goal.

TRANSLATIONAL RESEARCH INSIGHTS

ISSN 2631-9861

ISSUE 3

May 2019

To pursue this analogy, it seems to me that the current state of knowledge derived from meta-analysis in education is a bit like a medieval map of the world, a *mappa mundi,* where some areas are better known and more accurate, such as learning to read. In other areas, the evidence is less secure, but still coherent and positive, such as about collaborative learning or small group teaching. There are also other areas of research, like the 'here be dragons' section of a *mappa mundi*, where you can find the mythical tales of learning styles, multiple intelligences and coloured lenses which cure all kinds of dyslexia, and which all appear to offer an educational panacea (see Higgins, 2018 for a fuller account of this argument).

The distortions produced by the aggregation of individual studies, with their varying designs, populations and measures, first up to the level of meta-analysis then again up to the level of meta-synthesis means that this picture is not yet as accurate or precise as we would like. It tells us what has worked in these studies "on average", but contains all of the statistical risks of averaging averages. I think of this evidence as providing practitioners with a "good bet" for what is likely to be successful or unsuccessful, based on how large the average effect is as well as the extent of the spread of effects. We also have to remember that the effects in these studies are based on a comparison or "counterfactual" condition. In averaging the effects, we "average" the comparison conditions. We become more certain that something is likely to be effective, but less certain about what it is better than. This is important because an already highly effective school is likely to be better than the "average" comparison or control school. Any typical gains found in research will be harder to achieve in an already successful classroom. The larger the effect and the narrower the spread of effects, the more likely it is to be useful other contexts.

It also suggests that we need to be clear about what we should stop doing. Whenever schools adopt something new, they must stop doing something else. There is no spare time in schools. We rarely reflect on this, so it can be hard to tell what gets squeezed out. Research can also help us think about this, by providing information about things that haven't worked, or tend not to work so well, on average. Research has clear limitations in its specific applicability. It is about what's worked on average, not what works (or what will work) here. It is only once we understand this that we can use it appropriately.

If we do not test our understanding from time to time we will tend to build up a picture of what we think is effective based on only our own experiences and those of other professionals that we trust, creating a cosy consensus of 'best' practice. This may be coherent but not fully reliable unless tested with evidence or challenged by findings from research.

My work developing the Toolkit and trying to communicate what I think it means to teachers has led me develop a model which represents my understanding of this challenge (see Figure 1).

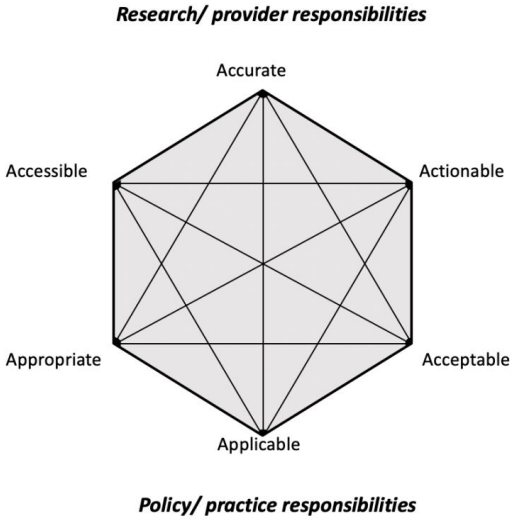

Figure 2: A model of research and practice responsibilities

Some of the responsibilities in the model are from the perspective of the researcher. These involve the research being *accessible*, *accurate* and *actionable*. This immediately sets up a series of tensions for the researcher, represented by the connecting lines in the diagram, to summarise findings *accurately* but succinctly in a way which educational practitioners can understand and put into practice. *Accuracy* refers mainly to how findings are summarised in relation to what was found (answering the question 'did it work there?' or addressing the internal validity of the study).

TRANSLATIONAL RESEARCH INSIGHTS

ISSN 2631-9861

ISSUE 3

May 2019

Understanding how research might be relevant in a new context is problematic in education (not least because we have almost no replication in education research and the samples of schools, teachers and pupils are not randomly selected). It is therefore hard to estimate how likely it is that an approach might be equally successful somewhere new. We know that *accessibility* is a key issue both in terms of getting hold of research evidence, but also in terms of understanding it. One of the main drivers behind the development of the Toolkit website was to create an *accessible* but *accurate* resource for education professionals. Academic journal articles are constrained by genre, form and the history of the discipline, and are rarely an easy read for the busy teacher.

How you distil findings into *actionable* steps is even more challenging. I've likened this before to picking the strawberries out of the jam (Higgins & Hall, 2004). You can sometimes see that the fruit is there, but they are so boiled and crystallised by the meta-analytic jam-making process that they no longer taste like strawberries!

From the practice perspective, there are also responsibilities in terms of the research being *applicable*, *appropriate*, and *acceptable*. A good fit between research evidence and the practice context is essential and this needs to be the responsibility of the teacher or school to meet the educational needs and capabilities of their pupils. It is important to know that it is likely to be *applicable* in terms of subject, age and approach. One of my worries about research from fields other than education is being clear about how the findings might apply in a classroom and a specific curriculum context. Psychology research on cognitive load, or neuroscience research into brain function are not directly applicable, though the findings often appear seductively suitable. When these findings are tested in the classroom, they often do not have the effects expected. It is also important to identify whether it is *appropriate* for the particular teacher and the pupils involved.

To increase the likelihood of it being *appropriate* I think it needs to meet an identified need or a perceived problem, rather than being picked from the top of a list of effective strategies, or plucked at random from successful research findings. Identifying a problem or challenge is more likely to create a match between the research context where it successfully made a difference and the new setting. It is likely to replace problematic practice which needs improvement, rather than replacing something at random.

One way of looking at the *Toolkit* is that it is a compendium of solutions to educational challenges and the extent and distribution of the effects gives you a probability of how likely it is to be useful. The problem is that the questions to which we have all of these solutions are no longer attached. It is therefore important to consider whether a particular research-based practice is *appropriate* as a solution to the challenges a particular school or teacher faces.

The final practice dimension is how *acceptable* the findings are. At one level, they have to be educationally acceptable. Some kinds of behavioural change may be very efficiently achieved with pain or discomfort, but they would not be educationally or ethically acceptable. The next level is more difficult to tackle. To stand a chance of being successful in supporting change, research findings have to be *acceptable* to the teachers involved. If the findings conflict with deeply held beliefs about effective practice then they may either be rejected and not attempted, or even adopted resentfully and set up to fail. I've always argued that, as a classroom teacher, if you presented me with a robust and rigorously researched reading intervention which was consistently successful when evaluated, that I could guarantee to make it fail in my classroom. Teachers are the gatekeepers of their own practice.

The irony I've experienced here is that the teachers who are more open to research-based approaches are often the ones who are already highly effective. They actively seek to increase their repertoire of strategies and are keen to try out approaches backed by research. By contrast, sometimes those I've felt might benefit most from trying out such strategies are the ones most likely to find them unacceptable. There are many reasons why the pharmaceutical model of research does not apply in education, not least of which is that it is not clear who is supposed to take the medication. The 'tablets' have to be palatable to the teacher yet be effective with the pupils.

So, is the Toolkit effective? We do know that it is popular and that over 60% of school leaders in England say they use it. There are also now versions in other countries such as Australia, Chile, Scotland and Spain.

TRANSLATIONAL RESEARCH INSIGHTS

ISSN 2631-9861

ISSUE 3

May 2019

We do not yet know if it actually helps schools make better decisions about how to improve outcomes for their students.

In the future it would be useful if the Toolkit could provide more fine-grained information, such as by subject and age. This will mean converting the evidence-base it uses from meta-analyses (about 200 of these currently) to single studies so that they can all be included consistently. This would also let us look in more detail at the importance of quality and the influence of features of research design (such as the length of the study, or the types of outcome measured). The Toolkit currently contains about 8,000 studies so this is going to take us some time!

About the author

Steve Higgins is Professor of Education at Durham University. A former primary school teacher, he is the lead author of the Sutton Trust - Education Endowment Foundation Teaching and Learning Toolkit. This article is an abridged version of one appearing in Professional Development Today (Issue 20.2).

How to Contribute

Articles should be no more than 2000 words and should be accompanied by a brief introduction to the author(s) (100 words), an abstract (200 words) and up to 5 keywords. Articles or any news items should be submitted as MS Word attachment by email to nadia.siddiqui@durham.ac.uk and lindsey.m.wardle@durham.ac.uk. Articles will be reviewed by the Editorial Board, and any changes requested. Editors are happy to discuss feasible articles.

DECE News

On May 1st, Professor Vikki Boliver gave a presentation at the Office for Students about the benefits of contextualised admissions in higher education. This followed the release of our Research Briefing No. 1 (see publications below).

On June 25th, members of the DECE team will be in Parliament as part of Evidence Week. We will have a pod where we will discuss the effects of Pupil Premium funding with MPs.

New publications by DECE members

Aleksić, G., Merrell, C., Ferring, D., Tymms, P. & Klemenović, J. (2019). Links between Socio-Emotional Skills, Behaviour, Mathematics and Literacy of Preschool Children in Serbia. *European Journal of Psychology of Education* 34(2): 417-438

Boliver, V., Gorard, S. & Siddiqui, N. (2019). Using contextualised admissions to widen access to higher education: a guide to the evidence base. DECE Research Briefing No. 1. Available from: www.durham.ac.uk/dece/briefings

Conner, M., Grogan, S., West, R., Simms-Ellis, R., Scholtens, K., Sykes-Muskett, B., Cowap, L., Armitage, C. J., Meads, D., Schmitt, L., Torgerson, C. & Siddiqi, K. (2019). Effectiveness and cost-effectiveness of repeated implementation intention formation on adolescent smoking initiation: A cluster randomized controlled trial. *Journal of Consulting and Clinical Psychology* **87**(5): 422-432.

Gravani, M., Hatzopoulos,P. & Chinas, C. (2019). Adult education and migration in Cyprus: A critical analysis. *Journal of Adult & Continuing Education.* doi: 10.1177/1477971419832896

Xiao, Z., Higgins, S. & Kasim, A. (2019). An Empirical Unravelling of Lord's Paradox. *The Journal of Experimental Education.* 87(1): 17-32

DECE Members Include:

Prof Stephen Gorard (Director)
Prof Jens Beckmann
Prof Vikki Boliver
Prof Tony Chapman
Dr Nadia Siddiqui
Prof Christine Merrell
Prof Steve Higgins
Dr Christina Chinas
Prof Carole Torgerson
Dr Nadin Beckmann
Dr Sol Gamsu
Dr Beng Huat See
Prof Peter Tymms
Dr Louise Gascoine
Miss Ourania Ventista

Follow us on Twitter @DECE_DU
Learn more about us on our website: www.durham.ac.uk/dece/

TRANSLATIONAL RESEARCH INSIGHTS
ISSN 2631-9861
ISSUE 3
May 2019