**2017 Online KT Conference:**

**Knowledge Translation Outcome Measurement**

Developing the Science of Enabling and Measuring Evidence Uses

David Gough, EPPI-Centre, UK

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>> STEVEN BOYDSTON Now I would like to introduce our first speaker for today. David Gough is the director of the EPPI‑Center, University of College London. Prior to this he was at the University of Glasgow and the Japan Women's University. His background is as a psychologist and initially studied child welfare and child disability services.

He's also served as the co‑editor of the Journal Child Abuse Review, and David specializes in systematic review methodology and research on research use.

David, are you ready to begin?

>> DAVID GOUGH: I am.

Thank you very much. Good afternoon, everybody. It's late afternoon for me in London U.K. and it is wonderful we have this amazing technology that we can talk to each other over continents. As you know, I work at the EPPI‑Center. And we have two main areas of related areas of work: The first developing methods for research synthesis, and more recently we're looking at how research is used, researching career development progress. You start with primary research and realize that you need to bring together what we know, and we bring together what we know and you realize that's not sufficient and we need to look more about researchers as well. That's what we'll talk about today in an abstract way trying to understand what we're doing.

I just did this in terms of six basic points. So the first one: What ways might research help decision making? So when thinking that research is a particular type of information that could be useful to decision making. There are a lot of other useful information that could be useful, but research is one type. The reason I put this in smaller font in black is I'm not talking much about that. I'll talk more about numbers 2 to 4 in this list.

If we take onboard that research may be useful then we need to be clear about what we know about research, clarifying what we know. So we'll say a little bit about the synthesis of research evidence with reviews, systematic reviews. Then if you say we brought together the body of knowledge, how do we need to be concerned about the quality and relevance? Do we trust it in a sense? What is the evidence claims? What are the evidence claims that we're making?

Then from that comes the point of, okay, we brought together a body of knowledge, we are confident that it is reliable, confident, then how do we try to make it useful, that's number four.

Then we have to study these things, we need research on research use actions and outcomes and part of that next stage is studying how decision‑making is informed or not by research with such evidence.

That was a quick overview. It will be 2, 3, 4 that I focus on.

Number 2 ‑‑ before that, we have this graph that tries to summarize the figure, tries to summarize the territory. So very simply it has four basic areas really, and one of the previous speakers talked about knowledge translation and system and I would very much agree with that, that there are all these different things going on. Four big areas, first of all is that you've got ‑‑ you want this research to be used, research is being produced in some ways, ways that research could use how people it chooses how research is done, one of the factors including priorities and I have divided that into primary search synthesis which we'll come back to.

On the left‑hand side we've got some of the research use, so people trying to make use of that research and to be ready for that to happen, there has to be a link up in some way, some engagement between us, there's lot of words used, knowledge translation, knowledge mobilization, knowledge exchanged and some people say that there are so many words so you can just put in any word that you like. I kind of preferred to use a more mutual term, engagement between the process of how research is produced and how it is used.

That's the bullet points of some of the ways it could be used and it comes from long time ago research and it was wrote years ago, Gough, and the way that the research may be used is using facts in an instrumental way, maybe using insights and concepts and enlightenment in a way and later introduced the concept of acquired use of evidence, where it isn't people deciding they like it or a system or requirement is probably the way that you work and where it is required that evidence needs to be used.

You could see that some of the policies, they're saying that you're required to use evidence if you're moving in that direction. I put that all in pink because they're hopefully quantitative ways of using evidence so long as the system evidence are benign, of course. In red there are the superficial use of evidence, tactical, policy led, politically motivated where you first make a decision and then you seek evidence to support it. Probably these terminologies are all very familiar to you. All of this exists in a context and, you know, research is not a big player in this context in the world and we need to acknowledge that. There will be lots of other factors.

If you see this system as an ecosystem and used as a metaphor like poem with lots of plants and insects and frogs and fish and then there's a lot going on and research would just be one little factor. Some of the big players within the pond may not be concerned at all about research evidence or its use. Research may be hiding underneath by these big creatures that are not interested in it.

A broad context is important in breadth but it is also important in more immediate effect to the extent that it does engage with research. I have the little two‑way arrows going along with research engagement, research production to show the way that they may interact and particularly people's way of understanding the world would be different and we'll come to that in a minute in terms of people's perspective, the values and priorities will be affecting research used with research engagement and research production. We tend to think about research as kind of something very concrete where of course it is very socially defined with different research questions will give you a different type of answer.

Next slide, research is not a value‑free process. There's lots of examples of that in my country. In reproductive care, services, in the 1970s the practice, the research was very dominated by clinicians who are very concerned about safety ‑‑ total safety and infant safety quite rightly. As they were so successful and the mortality rates were really, really reduced then other factors became important as well as safety. It was research by a mid‑wife that changed the perspective of research and they got to study other aspects of maternity care that were important to the players, the parents. The whole literal research changed during the 1970s and 1980. It will have different respects, different topics of interests and different values.

A more immediate example in the U.K. is the priority affecting health, health research and health service has developed agencies to help with that and to change different lines that have been started with collaboration with reviews and a lot of energy in ensuring the things that we study are relevant to the different stakeholders who are concerned in the decision making, in the decision making that we need research that's relevant to the decision makers.

So to have the background in a way to ‑‑ well, we argue that the research could be a useful component and what other steps will we have to go through. The first is looking at that issue, in respect to this issue, looking at it with different perspectives than people opened.

We often do risk reviews or we support others in systematic reviews and we encourage all reviews to try to find out from different perspectives and invite people to be on the advisory board who have different perspectives. Sometimes we get resistance to this but they're not actually like our perspectives and the focus is having the different views is not to make you certainly follow the perspectives but for you to be aware of them so that when you make a choice about that, about the research question, the research focus, how you're going to address the issues just from where you're coming from in terms of your own particular perspective. You may learn something from that.

When we do reviews for our Ministry of Health, they're like this, maybe early on they were anxious about having, for example, sectors involved in the work program but they now very much value that as giving an extra richness to the understanding of the issues that they're trying to research.

Then more detail aspects, of course, that is the analysis of where research may help. There are lots of professional practice situations there may be decisions made because of resources and research may have some impact, but it may not have much of the same decision‑making process. There may be other places where people are crying out for some research to assist in the decision making.

An analysis of the policy making or the practice making to see where the research evidence may be most strategically used. Of course, that's an ever‑changing situation. I'm very aware at least in my country people tend to rush in to doing studies and research without fully assessing the way that the research would like to be involved with the decision‑making process. Then when you've got greater clarity, they have the assumption that's empirical data that you need to help with the decision making. But back 30, 40 years ago it was argued that probably with enlightenment had more impact on change, on people's decision making than the facts. We like facts, I like facts. We must really be careful not to underestimate the insights in the perception and analysis of research you get. Where I work, we see ‑‑ we see that going together and two sides of the same coin. We have a mission statement that we need to consider issues. It is only then that you can have a position to have a pure research question in any detail.

The side, we need to have greater clarity of how we go about the process and the simulation, the science and values of problem definition.

We know what we want to know, we know the research question is, and that ‑‑ people love to rush in and do primary research, but we should respect our fellow human beings and look to see what they have already done before we go and expend the energy on finding general primary research. I have a little mention of what do we want to know, what do we know already, from existing research, and how do we know it, and what would we want to know and how could we know it?

So the bits in blue about how do you know it and how could we know it, it is really important. My experience is that a lot of it isn't necessary well thought out or the best designed use and we don't learn enough from previous mistakes. Knowing what we know in doing things, knowing how we know it and the experience of trying to find out research, existing research knowledge should help us finding good planning new research.

So I'm just going to go through a bit of the logic of the use. Again, many of you know about this already. When people think research might be useful sometimes they'll tell you about a study that they happen to know. I know a study. As a systematic reviewer, it makes me anxious. It may provide insights but it may be fallible, it may have pathological problems, it may not be representing everything known, that could be because of the sample that was used in research, coordinating the research studies that this is about the social work and I believe on one group of people or one particular town, one particular country so the general reliability may not be that great.

Even if those things are under control, you also need to make sure that the focus of the study is in the proper alignment with the decision making they want to make.

So anxieties in individual studies. Part of the represented of course, unless you have a very large study of a very large sample of total population in the other studies.

So strategy number two is using experts unless you can't because an expert ‑‑ research expert should know about a thing. But again, there's some dangers with experts, we must respect them, of course, they have lots of specialties, experience, in summing together research there is danger. The first one, it is opinion or research. You may think, well, sure people make clear what is clear in research but in the literature you can find Examples where there have been misunderstandings where an academic research setting, which they have the personal view rather than the research and how it is being interpreted.

The second is practice or research knowledge: This cannot be an issue with clinical work because people can be very, very serious and in the process of doing things, we'll talk about that experience which may be, of course, we may need to be useful and respectful and not the same type of knowledge of research knowledge that you get that goes across clinicians rather than individual and we have cases in the U.K. where evidence presented in court has been understood as ‑‑ it seems to be practice knowledge and decisions about people's lives were made, people were sent to jail on the basis of a misunderstanding about the nature of expertise.

The next one, it is just going back to the respective issue, the theoretical and ideological, it is that research is on value 3, to have the underlying assumptions which are not always made clear and I think we have to make it clear, I have in brackets this quote, single topic pressure groups, this is from a U.K. politician that was dismissing academic advances because there were ‑‑ ‑‑ what he thought he was hearing, it was a perspective of research finding and the researcher was ‑‑ I was very depressed by the statement. I felt that the research has ‑‑ of course it has something to offer, something of value that's different from advice but the clarity of distinguishing the respective ‑‑ how the ‑‑ how you're engaged with the framework within the research is presented isn't made sufficiently clear.

The next is about boundaries and depth of knowledge. In my research field there's some things that I know to a reasonable detail. There is a reason for my area of interest, that knowledge slowly becomes shallower and I want to ask my knowledge of the research in the area, it will make a difference if it is right in the center of the piece or if it is a bit on the peripheral, out on the periphery.

If you're a professional practitioner, of course you wouldn't want to give experts advice which is on the periphery but it is still unclear about what is the center and what's a little bit off center.

The next one is about being up to date because research happens all the time. A very common example of that in the U.K. is that most of our ministries have scientific experts or scientific Committees and the people who run them are very respected, well‑known speakers, but to have the time to sit on the Committees, they may not be considered in research quite at the moment. They may otherwise know the most recent research and the example of this as often quoted is about encephalous and the Mad Cow Disease, we had a problem in the U.K. of this disease getting in the food chain and so the Advisory Committee gave advice to the government, but later on researchers said that actually the expert committee knew little about what they had spoken to the Committee on and what they had said.

The other thing is that as an individual, if I'm asked to summarize what I know about something, the way I'm bringing that information together is very implicit, it is not clear how I have gone about the process.

There's anxieties about expert representation of research knowledge and there's ‑‑ it is also similar about traditional mixture of use which may have been done in a very ‑‑ if you don't know how they have been done, it is not a simple process. Therefore, primary research we expect, we require researchers, that's what they did and why and to write‑up the method section. We don't just take it on trust, just please trust the finding. It is the same with the reviews of the literature that we shouldn't just take it on trust, however, with the skills or famous the person is, you want to have clear ‑‑ clear explanation of the method that was used, the research underlying the questions and then people can question the results. The results are accountable.

That's why my colleagues and I are interested in gathering research methods and it is the signs of synthesis, the signs of synthesis methods. We get a lot of calls on the systematic review methods and a lot of people who come to the courses have done a lot of research and unfortunately the tendency clears their mind a bit, thinking they're studying something brand‑new and they need to get everything that they have learned before. I think it is a real pity, the systematic reviews, they're not really any different from primary research, they're just a high‑level of analysis. The primary research, it may have data from research participants or other types of information and going back home and then analyze it and this review to my knowledge is just the same but instead of getting the real world you're going out in the preexisting studies and collecting the information from the studies and then sent sizing that.

Then the analysis, it comes through uses, the statistical analysis, but all systematic reviews are a different level of considering things.

We have this here. The expectations of vigor transparency, the same breadth of questions, the questions of primary research can be an effective intervention that works but it could also be questions about processes and about being about risk and about prevalence, it could be about ways of understanding the world. So the same range of question that you find in primary research are reflected in the overview, the review level. Just as in primary research, we have made some ‑‑ we also increasingly have mixed messages in reviews of literature.

A few years ago somebody came up to me and asked me what I did and I started to talk about systematic reviews. He said oh, I don't like systematic reviews. I was shocked. How can that be? How can you not like systematic reviews? He said because I don't like the randomized control trial. I said, well, that's not a reason for not liking systematic reviews. Systematic reviews as I have explained, it is just a high‑level of analysis and you can review anything, of what the ‑‑ of what you will review systematically, it all depends on what your research questions are and what would be relevant data. That's previous existing studies for answering that. If you're a quality researcher and you have the experimental work, that's not a problem.

So we have a real explosion in approaches to synthesis and methods for the moment.

The next slide, it just missed some of the dimensions in a different way, but these reviews vary.

So they mentioned the difference and not one or the other, they are dimension but for the ease of explanation I'm putting this in an extreme way.

The left‑hand column is the dimension. The next two columns are two different ends of the dimension.

I'm going to use as my two examples a question where you're trying to understand the dynamics that are going on in a health clinic. Trying to understand the social dynamics going on. The question may be very, very open. You're trying to develop a series of understanding, trying to generate ideas, the approach to this may be in such a method that you have the graphic study, for example, it may be a smooth scale sample when trying to look at things in detail and understand what's happening.

The methods of the primary research are very illustrative. You are kind of taking a journey, exploring what happened. You don't know at the beginning where your journey will take you. If you're doing a review of such studies, doing the primary research then your method of doing that synthesis would reflect the synthesis with the method of doing that, the approach would reflect the approach of the primary research. You would be open question about generating ideas and you may find all of these different ideas with no graphic studies about clinics and you try to bring together the different ideas and maybe create an explanation bringing together these ideas, a new competence and a powerful strategy concept from a different study. This would be very, very ‑‑ it is very interesting. When you look at the study, it is not necessarily trying to find every study that's been done, but trying to find the range of different explanations that were found. When you quality assess the studies, it would be trying to look at what did they bring to the understanding, what did they add to maybe a new method, theoretical explanation. The concepts are emergents and would help give you enlightenment and concepts, a term of enlightenment. The primary research, the primary studies, it has a review of such studies that are very similar in that paradigm and in their approach and the way that you try to synthesize, we call configuring, we're trying to arrange ideas to see how they fit together.

Whereas a very different example would be if you're trying to do an impact question, what is the effect of introducing this new way of providing this service, therapeutic service. Then you have an idea of what you want to do and you're trying to test it. So you question in a way and there is a theory there but the theory, it is not developing the theory, you have the theory beforehand, you have the theory, the therapeutic approach, it would be beneficial and you're testing it. The primary study would be taking a priority approach. You would be saying beforehand what methods you would be using and executing them.

You wouldn't want to have much maturation because you would worry about bias, you're concerned there might be people’s views of what's been affected or even the unbiased influence of finding things, the selection bias, you may get people of different types in the group and comparison, et cetera. The primary study would be statistical experiment. If you're doing a synthesis of analysis, that would be ‑‑ this is a very simple, a quick explanation of the two extreme examples over the dimensions of different estimated reviews.

Just the primary research says the reviews that have the testing, the sub question, which has the statistical analysis and then maybe on a value‑base asking about people's views of this and understanding about the service and that would be more illustrative review of the studies.

We don't like using the word quantity of policy much, they're a bit confusing and they seem simple but if you look at quality of research, sometimes they do add some things up, so they do a bit of aggregation and most research studies that are often aggregating, there is often explorations of the findings which is exploratory and considering. So usually the configuring of the data, it is a better way to explain the nature of the difference between the two ways that you can analyze data either at the primary level or sent advertised level. We find them clearer.

So we have got synthesis and we have got ‑‑ we don't have synthesis, we have review. You may have two pair less sub question, but you may have a first review followed by a second review. The first review which is unpacking a theoretical area and understanding issues and maybe unpacking the theory of change and looking at the nodes or the chains and the causal change analysis and then you could do empirical synthesis on those synthesis ‑‑ a priority synthesis on each little bit of the chain.

Whether side by side parallel reviews or sequential reviews, different approaches and methods of use.

So moving on, so we have unpacked the perspective, we have unpacked the questions that we want to ask to help us make a decision. We then have gone on to try to find the evidence through a systematic review or someone else has provided the systematic review for us.

We then need to ask can we trust this information? Is it fit for our purposes? Can we make justifiable evidence claims that relate to our decision? Now, I have divided this up into three different components of this process.

The first thing, it is the review method itself is fit for purpose. So if I argue that systematic reviews are better than expert opinion while looking at one of two studies, you may know it sends a clear message. Just because it sends a clear message assumes that it is fit for purpose for your needs. Then, even if the method is okay, you must look at the included studies that we use within that method and then we need to look at the totality of evidence that's been produced by this process.

I'll go through these three in turn.

There are lots of these methods of review as I have already explained.

We need to know whether the method, whatever it was executed well. It could be badly undertaken systematic review, even if it has the label systematic review, it may not be a very systematic systematic review. Even if it is being well executed it might not have been the appropriate type of review for answering your question. So the previous presentations have been on complexity and the systematic reviews, they are difficult to do and expensive to time and they have primary questions. The question that's being asked may not be that relevant to the review focus. The focus of the review and the method of the review may not be what you need even if the label seems to be right and even if it was a very well executed review within the constraints of that review method. As a result it may have been a product of an approach of reviews which are well‑known and respected. It doesn't mean that's what you need. You need to be well executed but you also need to make sure that it is the focus of the question and the method used towards that question is what you need for informing your decision making.

Again, it may seem obvious ‑‑ obvious in practice and there is plenty of reviews out there which are used in decision making which in my view are aligned with the decision that they're trying to look for.

The second dimension is the quality of the included studies. This is an accepted process because when you do a systematic review one of the stages of the systematic review is checking that the studies are okay. In the systematic review you qualified the review question, you specified criteria, what studies that you want to look at with the question, then you have a strategy to have and then you check that they meet your criteria.

They may meet your criteria on topic in general methodological approach and they may be a weak study and they may not have the right focus.

These questions are the same as the review. They are relating to the studies of the particular review but they're the same kind of questions. They are ‑‑ are the studies including in the review well executed, is it method appropriate, is the focus relevant. You may be wanting to apply this to a decision and the research had been undertaken elsewhere, Somalia, for example, or other incidents.

When you look at ‑‑ there are many published tools for assessing, appraising studies, and people use these tools in reviews, but they came to a few that you know what is the best method so they may be tools for showing bias in studies or they may ‑‑ in experimental studies or questions related to how the research, whether it is reflecting the thing it was trying to study. So the questions asked in these vary on the methodology. Some best steps of approach, they may say, well, you have a badly executed way to control the trial, you may argue that's weaker than a very well‑executed crazy experimental study. What's the trade‑off between the design and how that design has been executed.

Then the third and final component is the evidence produced by the review.

Those of you who ‑‑ many of you probably know about grade and grade circle, have been very influential on this. They ‑‑ the grade tool for appraising evidence, appraises dimension 2 and dimension 3, don't appraise dimension 1 or method if they feel the method is appropriate or other tools, different review. Grade looks at quality of the studies and looks at the quality of the evidence produced and they have lots of different dimensions that fold into two main categories. One is about the nature of the includeness so you may have some aspects of the studies, the quality which you can't see on the individual studies, that you bring them altogether, it is that you ‑‑ for example, hetero genetic, each individual study may be strong, but when you look at them as a group they're very heterogeneous and it is very difficult to make statements about the evidence as a whole, to send size the evidence may be questionable.

Another issue in terms of the evidence produced is the ‑‑ is what the findings will tell you, whatever it is, because it may be that there isn't much evidence. Now, it may be that there weren't many studies undertaken on this issue and there's not many studies.

It may be that there were studies undertaken, but the search strategy has not been able to find them. That may be the first one ‑‑ there may be publication bias if not fully reported. So there's lots of reasons why there ‑‑ it is not really the thought of the systematic review, the systematic review is just telling you what you know and what we don't know. It is quite important to know what is ‑‑ how they are in the real world which has or hasn't been studied. What's been studied is just a component about wider reality and if you're trying to inform decision‑making in reality, we have to know, but maybe we need to study it some quickly.

So just as the synthesis of evidence is straightforward process, there are also the justifiable evidence claims isn't a simple process.

This brings me on to the engagement issue. You've got the question, you've done the synthesis, you have some finals of the synthesis and you checked that the evidence claim is relevant research. Then there is the issue about what is the research that's picked up. If this research has been driven by a very immediate question and I think it has been commissioned in that way, then this shouldn't be a problem. That's quite rare for a lot of practical reasons taking time. Often they're trying to find out about the evidence when making decisions without knowing about evidence.

What is the link‑up, how can we create better link‑ups between research? Going back to my picture of the ecosystem of the swamp of research use and engagement.

Last year my colleagues and I did a systematic review of evaluations of interventions to try and enable evidence use. This slide that you have now is our framework for analyzing that. The left‑hand box is trying to get evidence use could be done at the individual level, an organizational level or can be done at national level. I like national level. Then number 6, the middle one, these are some of the different mechanisms that you may want to use to try to increase research uptake awareness, agreements on research evidence, access to research and interaction of researchers and decision makers, research uses, skills and other research and these are structured processes that enable, it is a bit like the forced approach that we have talked about.

Then we have on the right hand, we have three aspects of behavioral components, the capabilities change, the motivations change and the opportunity to change.

The reason why we want to look at this is because a lot of people assume that the mechanisms are all going to be effective and so the next slide is from colleagues in Holland who are trying to develop better interaction in educational research between the ministry, universities and schools and this diagram, this image was trying to show how they ‑‑ you know, how they try to get that interaction together. That's very worthwhile and very important.

What we found from the research is that ‑‑ we'll go back to the previous slide, is that just that the interaction didn't seem to be very effective on its own. It also needed motivation and opportunity. If you didn't those in, just being frames between the researchers and research, it wasn't sufficient. It was the next slide, it was the combination of making it, particularly if there was structured process that encouraged them to be used really increasing the use of evidence.

This review is a very high‑level review. It was reviewed and in previous reviews and it also did a review of why the social science, but it has some evidence of what was effective and also had some evidence of things that weren't effective so this slide is the mechanism of greater interaction but we see red because without the developing people's capability in their work to be able to use research then it wasn't going to ‑‑ it wasn't going to be affected.

What we're really missing here is the many, many things in the field that haven't been studied. This is a new area of research and some of the speakers, other speakers in the conference have talked about this knowledge mobilization and this big area of interest. Even though this has been talked about 14 years ago, our level of research of it is still quite at the very early stages. In time I'm sure it will be totally developed.

What we need next, not just empirical knowledge, but we also really, really need better theories to do it. The framework of my colleagues, we built up on the work of other researchers, some from Scotland, from the U.K., and that people have proposed different theories and we have a strong overarching theory that brings together some of the issues that are discussed in this presentation today.

So my take‑home message from all of this, it is that that we need to be more scientific about all of these things. I have talked about the fact that question, definition, the sciences of systematic reviews and the sciences of claims and things and we often have the research and then the final one, it is part of the picture in that ecosystem is defined with decision making.

So I don't want to be depressing about this. One of the things that we have the opportunity to study that I am not such a young researcher but I find it the most exciting part of my career, these things are so important to how we move forward.

In terms of social sciences, we have had 100 years, the amount of energy of social sciences applied to this is relatively small. It is not only an important part of social science for social science, it is an important social science of every other science there is, not just health science, every science is producing evidence and that's to be used so we need to develop our sophistication in this area.

The last slide, it is just showing you some publications I'm involved in. So there is a book on systematic reviews, a second edition of our book on our approach to systematic reviews, second edition came out this spring. Not just statistical but all types of reviews. The middle publication is the report on the science of using science, which was a review on occasion and then just a little advert for this journal that both myself and Melanie Barwick are involved in, it is important on this evidence and policy.

I'll finish there. Thank you for listening to this speech. We hoped to be more interactive but hopefully we'll have a discussion in a couple of hours with my cospeakers.

Thank you very much for your attention.

Good‑bye for now.

>>STEVEN BOYDSTON Thank you. That was great.

We did have one question in the chat that's been ongoing, if you would like to look at that, you're more than welcome to. We're out of time right now for questions so we'll come back in the discussion session if anyone has follow‑up questions for David.