8.

The impact of educational research

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Introduction

I have been asked to comment on the ways in which educational research has an impact on education. I appreciate very much the opportunity to do that and to contribute to this important conference commemorating the fiftieth anniversary of the National Foundation for Educational Research. I would like to share the sentiments of gratitude voiced by others and commend NFER for being so generous in designing a conference which looks more generally at the status of educational research at this point in time, as opposed to reviewing their own accomplishments.

I am speaking in substitution for Marshall (Mike) Smith, who is a policy researcher in education and is presently Acting Deputy Secretary of Education in the United States. I believe this is the highest federal post to which a bona fide educational researcher has risen in our country. As a member of the Administration, Mike is in the enviable position of being able to set and to study policy at the same time!

My organising metaphor for talking about the impact of research on practice in this paper is that of a telescope: the relationship between research and practice can be thought of as a telescope which can be viewed through either end — top-down and distant, or bottom-up and close. I will develop this more, but the basic idea is that the connection between research and practice can appear to be very remote and small, if viewed from the top, or it can be seen as very close and immediate, if looked at in detail.

I believe research has a fairly extensive impact on education. The problem is, this impact does not necessarily occur in the ways we once thought it did; and, to see the impact, you have to look very closely at some specific instances.

How research can have an impact

There are three ways in my mind by which research can have an impact in education.

One of these is in revealing patterns and phenomena in the system. Here, research performs a descriptive or exploratory function, providing us with information which allows us to see how things are.
Another way in which research can have an impact is by changing our understanding of underlying processes involved in education. I must confess that we do not know very clearly how such a developing understanding affects practice, but it has been proven through experience that understanding basic processes plays a role in improving the nature and effectiveness of the professional practices we use to develop those processes.

A third way research can have an impact is by clarifying and guiding the roles of various actors in the educational system. By this, I mean that research can explore and explain how various roles in the education system work, and we can use that information to adjust the roles — how we perform them and how they work in relation to one another. Much educational research has been of this nature: looking into the roles of teachers, school leaders, policy makers, families or members of the community.

**Specific instances of impact**

Under each of these suggested modes, I think we can point to some fairly concrete and significant instances where research has had an impact on the education system, at least in the United States.

An example of how descriptive information can affect the system is our recognition and response to low achievement in urban school systems in the United States. By the 1940s or 1950s, our cities had been left with a very disproportionate share of poor children. For whatever reasons, the educational achievement of these students was a special challenge. Until the 1960s or 1970s, we did not really understand how bad this problem was because we did not have data. Then, regular administration and summarisation of standardised achievement tests became widespread, and we could see that students in urban systems were at about the twenty-fifth percentile on these tests, compared with the fiftieth percentile average. We would not have known how severe the achievement problem was if the testing had not been done and if the results had not been displayed grade by grade, subject by subject.

The response was at least a great *push* for better achievement in the cities. The federal government and the states launched compensatory education initiatives, and there was a great movement for better teaching of ‘basic skills’. That push did not result in much progress in student achievement — although there was some limited success in bringing about gains in the 1970s and 1980s — but the main point is that we would not have known about the problem at all without the test results. (American cities seem to be too
overwhelmed by the problems of poverty, scale and political will to be able to do anything substantial or lasting about these achievement problems.

There are clear-cut examples of how practice has been affected by research into the processes it is concerned with. One of the best examples in my mind is research on basic reading processes. In the mid to late 1970s, basic psychological research began to investigate and explain how reading takes place. This research moved us from a behavioural to a cognitive model in our understanding of the process of reading. We came to understand how readers integrate new information with what they already know and how their ability to guide their own reading processes affects the effectiveness of their reading.

One project in particular comes to mind. About 1979 or 1980, the National Institute of Education (NIE) received a proposal from Scott Paris and his colleagues at the University of Michigan. The proposal was to do an experimental study to determine whether, if metacognitive skills in reading were taught directly, this would have an effect on reading performance. This was a classic instance of needing an experimental study to confirm causal connections when correlational studies already had confirmed an association.

In this study, it was proposed that college students be used as the sample or target population. Those of us at NIE at the time suggested that elementary school students be used, and that the study be done in the context of a public school system. These changes were made and the study was implemented. It found that by directly teaching these skills (to monitor and manage their own reading) the ability of low-achieving students to read could be improved. Probably more important, a sort of 'enfranchisement effect' seemed to take place: students who were taught these skills had higher reading abilities than control students a year later, without any further intervention.

Other research in this area explored reading comprehension processes, looked at the quality of textbooks and tests being used in the schools, and explored cultural and background effects in reading. This research completely changed our research-based understanding of reading. Gradually afterwards, practice began to change. Textbooks and instructional programmes began to address comprehension and metacognitive skills directly. More authentic texts began to be used in reading instructional materials. Reading tests were reviewed to examine how well they measured important aspects of the reading process. Teacher training began to change, so new and serving teachers were taught how to use more research-based techniques. By the late 1980s in the United States, practice had been largely transformed.
So, even fairly basic research explaining the processes we are trying to develop in students can allow improvement in the approaches used to develop these skills.

A further example of research impact is when research explains various roles in the system. In this instance, I want to give a counter example of how research can have an impact: an example where the impact has been negative, to show how consequences can be unpredictable and counter to what we want, if we are not careful about how we interpret research implications.

This example is what we in the US refer to as effective schools research. In this instance, we had correlational and outlier research which was aimed at finding characteristics of schools which were associated with school success or unusual school effectiveness. Among the findings was that, in effective schools, principals or school heads were particularly effective ‘instructional leaders’.

That was all well and good; where things went bad was in how these findings were interpreted and implemented. It led to much effort within the United States to have principals acquire the attributes of effective instructional leaders. The problem was that this was done in a simplistic or superficial way, eventually degenerating to things such as stipulations that principals should get out of their offices and go up and down hallways to visit classrooms and supervise what was going on. This, of course, became unproductive or counter-productive to genuine instructional leadership since it did not embody very effective practices. But it shows how research findings on the roles of significant agents in the system can have a tangible effect on behaviour.

Perhaps more positive examples might be found in research into teaching or into family involvement in learning. We have had very good research which has elucidated the nature of high-quality, effective teaching, and this has allowed us to refine our school improvement and teacher training approaches. We also have had good research which has given us better insights into how different kinds of households relate to the schools. This has allowed some school systems to develop improvement efforts, tailoring the practices they use to work with different kinds of families.

Another instance of impact can be found in international/comparative studies. In the US and, I think, other countries, the policy interest in international comparisons is resulting in these studies having great impact. We were largely alerted to questions about the effectiveness of the US education system by mediocre standings in international studies. Fortunately, the powerful,
descriptive nature of those studies is no longer confined to just the achievement bottom line: recent results from the IEA Third International Mathematics and Science Study prompted as much interest by the press and policy makers in comparisons of instructional practices as in the achievement rankings.

**Horizontal and vertical dimensions of research impact**

The process of educational improvement has a horizontal and a vertical dimension in the US, and it is possible to think of the impact of research playing out on these two directions.

*Horizontally*, we are working under the concept of systemic reform — this is seeing broadly how elements in the system are organised and making sure that they line up with one another coherently. By elements, I mean curriculum, the content and expectations of assessments, teacher training and licensing, accountability mechanisms, and so on. We have discovered that, in many situations, because we have a very decentralised system, these elements may not be in alignment with one another. An assessment programme might be in place which does not reflect the latest curriculum developments, or state efforts might be in conflict with local or national ones.

Research can inform and guide the nature and alignment of the various parts of the system, showing us what to do so that things are aligned more effectively. For example, if research on learning processes suggests curriculum or teaching should be changed, we know from this systemic view that assessment, teacher training and other elements may also need to be changed to support the improvement we are trying to make in instruction or curriculum. That is how the horizontal dimension of this view plays out in relation to research innovations. Research also, of course, helps us to determine how the elements themselves should be thought of, as indicated above.

On the **vertical** dimension, we have to attend to the implementation of reforms. We have found in the US that movements or exhortations at top levels of the system — state policies or national movements, for example — will not have an impact if efforts are not made to make sure teachers at the classroom level understand and implement the reforms or approaches effectively. Here, when research suggests a change, we now are beginning to think in terms of strategies which will result in knowledge, understanding and effective implementation at the most immediate levels of practice. This translates into a need for deep and faithful processes of teacher development and support, in contrast to the kinds of wand-waving and magic bullets we often tried to use in the past.
8. The impact of educational research

Research and its responsibility for the process of change

Seamus Hegarty (above) observed that research is unfairly criticised for its role in the change process. The criticism is that research should bear responsibility for having more of an impact — that if it was effective, it would have more impact. The implication of this criticism is that research should be more conscientious and useful, addressing topics and being done in ways that result in more of an effect.

I concur with Seamus that this criticism is unfair. Research is one of several types of information that are available to inform or guide practice, so the choices of practitioners in the information they choose to use is somewhat beyond the control of the research enterprise, and research by itself cannot guarantee that it will be attended to and have an impact. Contemplating this relationship, however, reveals that research has an impact which is complex, difficult, unreliable and difficult to understand. Let me develop each of these qualities.

First, that research is complex in its impact: this means simply that the processes by which impact occurs include many factors and that they play out and relate to one another in very complicated ways. I think this holds true for many of the examples we looked at: the reading research and school effectiveness examples described above certainly reflect this complexity and subtlety.

Second, that the process of impact is difficult: by this I mean that the process by which change occurs as a result of research is difficult — that it is not easy to accomplish. I think most of us would concur with this on the basis of our own experience. Again, the examples we have talked about illustrate it. The reading research example was one in which change occurred over a period of ten or 15 years, not very quickly or easily. The instance of effective school leaders underscores the subtlety of the process. And the example of urban achievement is one where desired effects have not been accomplished even now, after 20 or 30 years.

Third, that the process is unreliable: by this I mean that the process by which research has an effect in actual practice is usually difficult to predict and control. In most of our experiences, the change process unfolds in ways that cannot be anticipated reliably. The effective schools example certainly confirms this: things developed in a completely different way from what was anticipated. This poses a dilemma for us in how we look at research and its impact. It may be that much, if not all, of the impact is largely unpredictable,
or at least that the impact will take on a character which is largely different from anything we could speculate about ahead of time. Could anyone have anticipated that basic psychological research into reading would have a major impact on how reading was taught? Probably not. But if it is true that impact occurs in largely unpredictable ways, is there any rationality to the system? Can we say that there is anything systematic about the way change occurs as a result of research?

To respond to that, we identify some general kinds of impact that can be predicted. For example, we could say that basic research like that which was done on reading would generally have some impact such as we observed. We might look to similar kinds of impact from other areas of basic research, albeit not as extensive or exactly like that observed in reading. Also, there probably are areas where the impact of research would be more predictable.

Finally, the ways in which research has an effect are difficult to understand. Because of its complexity and subtlety, it is not easy for us to come to understand the change process at all, let alone the role of research in it.

Now, what can we say about the change process and the role of research? First, I think one of the most important things to point out is that none of us really believes in a production metaphor for this process any longer. At one time, we conceived of a linear process from basic research to applied research to development to implementation to evaluation. We know that the actual process is more complicated, more subtle and more organic than that, and we have not often seen that linear process work in practice. On the contrary, we have seen other, more complicated processes in real life.

What are those real processes like? Let us take the example of class size to explore this. Over the years, a great deal of research and synthesis of the research have been done on the effects of class size on schooling. No simple, clear, right or wrong answers have become available, certainly not early on. Some studies said one thing, others suggested something else. Reviews of the literature and meta-analyses were done. Big, definitive studies were designed and conducted to resolve the issue ‘once and for all’. Finally, some complicated conclusions began to appear: class size had certain effects within particular size ranges and had different effects for different types of students. At this point, after decades of research, review, synthesis and development of implications, we began to have some guidelines for practice out of research. But, the process of arriving at these implications was much longer, more complex, more subtle and more iterative than the production process we might at one point have had in mind.
To continue with this example and explore how things become even muddier, with guidance finally in hand from research, we could see policy makers making decisions in response to factors other than research. Teacher groups and parents wanted smaller classes, regardless of the research literature on the effects, and this push was often powerful enough to warrant changes, even at great extra financial cost. What is important about this development is that it shows how research — subtle, imprecise and complex as it is in its own role — is but one of many forces driving change in education.

This leads to a corollary to Hegarty’s observation: that professional practitioners and policy makers are not necessarily very conscientious in how they use research. I believe this was said by Susan Fuhrman and others. Not only is it not fair to expect research to bear too much of a responsibility for the impact it has, it is also reasonable to expect other actors in the process to do their jobs more effectively, and sometimes this means using research findings more conscientiously.

**Mechanisms by which research can have an effect**

All of this then leads me to summarise several ways by which research, understood in this more complex way, can have an effect.

One of these is by expanding our theories of education and the underlying processes it affects. An example was given previously on learning to read. Research truly has made it possible for us to develop powerful cognitive models of learning, and that has had an effect on education. Another example is teaching. Research has resulted in a progression of views of teaching — a series of evolving theories, the most recent of which has been moving to a view of the subject-specific clinical practitioner from a generic view of good teaching. Other areas where this has occurred include theories of schools as organisations and work on how schools should relate to their students’ families.

How should this process of theory-building be structured and supported? How can we ensure that research continues to result in breakthroughs that enable us to acquire these new understandings of underlying issues or processes in education? Actually, the process of basic research is generally a process of theory-building: research is often, if not usually, done to move beyond current theories. In this way, the process constantly ensures that research will be done which allows us to develop our theoretical understanding. In this sense, I do not think that ‘management’ of the process of basic research is necessary for it to continue to have an impact on education. Rather, as long as basic
work is done in psychology, sociology, anthropology, economics and so on, it will generate new understandings, some of which will be applicable to education.

I do think the connection between basic research and its theory-building and educational improvement can be enhanced. Basic researchers can be sensitised better to the potential implications of their work for education, and educators can be alerted to the potential implications of even very basic research. Researchers tend unnecessarily to see their work as being very distant, and educators look too much to applied research and evaluation for implications, and too little to basic work in the various disciplines.

Another way research has an impact is by providing information on what is going on. This is a hobby-horse of mine, but I think it is important. Empirical research offers the tremendous benefit of objective, systematic information on phenomena we are concerned about. As an enterprise, education can take place without much systematic information being collected on it. We know that only too well! The void can be filled, of course. Earlier, I talked about test scores of urban students. That is a good example of the kind of information and its impact. Another is information on distribution of services. This is extremely important in order to know where the strong points and weaknesses are in current educational programmes. We are learning how surveys, including international ones, can be used for this purpose in the US. However, very little survey activity is undertaken to find out how things are out there! States and local school systems, which operate schools in the US, could use this information to great advantage for improvement of services where it is most needed.

Another example is microscopic work on the implementation of reforms, such as that of David Cohen and his colleagues. That research is showing us that reforms are not being implemented as we imagined they would be, by observing practice in some sites in great depth and detail.

Another route is by informing the development and implementation of new approaches and products. It is not very glamorous in the academic scheme of things, but good research into the effectiveness of techniques and approaches is painfully scarce in education. When studies do come out, they are so rare and striking that they attract a tremendous amount of attention. Of course, we have had much experience with methods studies that have been flawed: factors that have not been accounted for, inquiries that have not been done in enough depth, failure to base studies on strong enough theoretical foundations. But we have learned how to avoid many of these mistakes, and we should be
doing more work which informs the selection or use of approaches in education.

What is the role of certain agents of change in the process?

There are several agents which contribute to change in education. What is their role in the process by which research has an impact in education?

One of these is information. Through professional information sources and through the general and professional media, information can play an important role. The problem is that we may have outmoded models in mind for the role information plays. We may have something analogous to the production model in mind, when in reality other processes are at work. The question is, if research is to have more of an impact, how could information help?

Let me provide one thoughtful, positive example. This comes from the State of Kentucky. Many of its reforms are founded on research, but information is structured and used in very strategic ways. Teachers are sent newsletters directly reporting in a concise, accessible way the directions of the reforms and their rationales. They are not spoon-fed or patronised, but rather given the information and rationale that they need as educators. And information is provided to them in creative ways: rather than sending it to them through the bureaucracy, it is sent to their homes where they are more likely to notice it and read it.

Another hugely important agent is training, and it seems to be in a position to play a critical role in ensuring research has an impact in the future in the United States. We are trying to bring about research-based reforms on a wide scale, but the capabilities of teachers and other practitioners is a major problem. Their capabilities simply are not up to the vision of learning which research has enabled us to develop and which we want to move toward. The problem is that we need change on a massive scale, and training appears to be the only answer. We have to develop new kinds of genuine capability in teachers, so we need to be able to use pre-service and in-service teacher training to develop that skill in a large number of teachers. We have not been able to do this in the past, however, and we do not know how to structure and use the training system to accomplish it.

Some models of how it might work are beginning to emerge, but they are very different from how we have structured teacher development in the past. One model is professional development schools, where schools essentially
are in a collaborative relationship with universities, working together around the problem of improvement of practice. Other approaches include coming up with very different models for pre-service and in-service training, with the new models aimed directly at improving the ability of teachers to teach to the new visions of learning. Long-term, professional improvement networks are an instance of this.

Another agent could be professional support—particularly using information technology. Teachers and other practitioners receive little support for their professional practice, but such support could make a great deal of difference in helping ensure that the implications of research are realised. Some programmes in the US are aimed at providing information and more structured, active forms of professional development to teachers, basing the support on the implications of research. For example, professional improvement networks work with teachers to help them develop their practice in ways suggested by research, and some states and local school systems are accompanying instructional reforms by supporting teachers to adapt their practice in desired ways, sometimes using telecommunications technology. Schools of education are adopting computer networks as a way to mentor teacher trainees and enhance the transition to practice.

Given all this, how can we help ensure that research has an impact in the future?

It helps to remember that the role of research in relation to practice and improvement can be like a telescope: we can look through from the big end or the small end—which end you use drastically changes your perspective. The top-down perspective gives us a very distant view of how research is related. However, this view is probably not relevant any longer. Instead, we need to take the ‘small-end’ view, requiring that we look in much more focused and immediate detail, and that we be much more modest in the scope we expect the impact of research to have. Bearing this in mind, we can see that research can have a tremendous impact—

- expanding the theoretical understanding upon which we can base practice;
- providing us with crucial information on what is going on in the system; and
- guiding our roles as educators, managers, policy makers and researchers.
This suggests that we can do several things to ensure that the impact of research is maintained in the future:

- continued support for basic research into processes;
- continued descriptive information to guide the system;
- continued, careful work on roles and other aspects of the system;
- careful work within the system on the implications of research; and
- work with professional communities on improvement of practice.