

Lessons from the Evaluation of the UK's NHS R&D Implementation Methods Programme

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Abstract

Background: concern with research implementation was a major factor behind the creation of the NHS R&D Programme in 1991. In 1994 an Advisory Group was established to identify research priorities in this field. The Implementation Methods Programme (IMP) flowed from this and its Commissioning Group funded 36 projects. Responsibility for the programme passed to the National Co-ordinating Centre for NHS Service Delivery and Organisation R&D which, in 2000, when most projects had finished, asked the Health Economics Research Group (HERG), Brunel University, to conduct an evaluation. This was intended to cover: the quality of outputs; lessons to be learnt about the communication strategy and the commissioning process; and the benefits or payback from the projects.

Methods: we adopted a wide range of quantitative and qualitative methods in the evaluation. They included: documentary analysis; interviews with key actors; questionnaires to the funded lead researchers; questionnaires to potential users; and desk analysis.

Results: Quantitative assessment of outputs and dissemination revealed that the IMP funded some useful research projects, some of which had considerable impact against the various factors in the HERG payback model, such as publications, further research, research training, impact on health policy and clinical practice.

Qualitative findings from interviews with Advisory and Commissioning Group members indicated that when the IMP was established, implementation research was a relatively unexplored field. This was reflected in the understanding brought to their roles by members of the Advisory and Commissioning Groups, in the way priorities for research were chosen and developed, and in how the research projects were commissioned. The ideological and methodological debates associated with these decisions have continued among those working in this field ever since. The need for an effective communication strategy for the programme as a whole was particularly important. But in the end one was never developed, making it difficult to establish the general influence of the IMP as a programme.

Conclusions: What we found about the impact of the work funded and about the difficulties faced by those developing that programme have implications for the development of more effective research in this field.

Background

To achieve optimal care for their patients, healthcare systems must actively promote the quick transfer of sound research evidence into practice. None do so consistently and comprehensively. [1-2] The question of how to achieve effective research implementation is a key feature of WHO's analysis of health research systems [3], and recent studies reinforce the desirability of looking at research implementation in relation to specific health care systems. [4]

In the UK the gap between research and practice remains wide despite a considerable, and rapidly growing, literature on research implementation. [5] What is wrong? The answer risks sounding trite. Implementing research findings is hugely complex, and we still have too little grasp of that complexity. This paper looks at the recent history of research implementation in the NHS through the lens of an evaluation of the NHS R&D Implementation Methods Programme (IMP). [6]

The NHS R&D Implementation Methods Programme (IMP) was developed in 1994, and was an early attempt to explore in depth the issues of research implementation. [7] It was also the last in a series of time-limited, national NHS R&D programmes, and followed a well developed model for setting priority topics and commissioning research. This model had been developed to address research need in fields such as cardiovascular disease and mental health, and was largely clinically-focused, with an emphasis on randomized control trials (RCTs) as the gold standard research methodology. In contrast the IMP covered a new, different, and very complex field which had not previously been systematically explored, spanning a wide range of behavioural, social science, management, science policy and health service interests. There was a need to think beyond the clinical model. A timeline showing the key elements of the history of the IMP is presented on Table 1.

The evaluation of the IMP was funded by the NHS Service Delivery and Organisation, and was designed to explore the quality of the outputs of the programme and the commissioning process and to see what lessons could be learnt for future commissioning and communication strategies. A range of methods was adopted and provided quantitative data about the outputs and dissemination and qualitative findings from the interviews with Advisory and Commissioning Group members. What we found about the impact of the work funded and about the difficulties faced by those developing that programme have implications for the development of more effective research in this field, both in the UK and elsewhere.

Methods

A range of quantitative and qualitative methods was used and triangulation techniques were applied.

Documentary analysis

Analysis of published IMP documents was supplemented by a review of IMP files, exploring the development and work of the IMP, and the statements applicants made initially about the potential users of their research.

Questionnaire to the 36 lead applicants of IMP-funded projects

A questionnaire was sent to all 36 lead applicants of IMP-funded projects. This was based on one developed by HERG for the evaluation of projects and specific programmes within the North Thames Region NHS R&D Programme. [8-9] Questions covered knowledge production, each project's contribution to research training and further research, and the possible impact of research findings on health policy and practice. Limited resources precluded any attempt to assess final outcomes in terms of benefits such as health gains but the questionnaire did explore ways in which the dissemination of the research findings from IMP projects might have contributed to their impact, and the role of the IMP as a whole in this. Following an extensive process to encourage participation, the final response rate was 30/36 (86%).

Questionnaires to potential users on the dissemination and use of research findings

Some projects were grouped by subject matter, and for each group a short questionnaire was designed. The questionnaire supplied information about the three or four IMP-funded projects in the particular field, including the abstracts from the most important article from each project. It sought information from selected recipients about the dissemination and potential use of the research findings in that group. Four questionnaires were developed, three were distributed electronically and one was mailed. The postal survey was sent to 207 Heads of Midwifery and 20 university researchers in perinatal care.

Desk analysis

The aim was to identify both the number *and* the quality of the publications deriving from the programme. Previous analysis has demonstrated that it is not always sufficient to rely on the information about specific project publications returned by researchers—either to programme administrators or in questionnaire surveys undertaken by evaluators. [8] Articles are sometimes not correctly attributed to the programme, or are incorrectly attributed to the programme, or have a confused provenance. Some additional checking was therefore conducted of the articles that were claimed to have come from projects funded by the programme. In addition, various databases were interrogated to assess aspects of the research outputs from the IMP. Citation analysis was undertaken for journal articles using the Science and Social Science Citation Indices from Thompson's Institute for Scientific Information, and the journal impact factors were recorded for the journals included on the database.

Interviews

Twenty-five semi-structured interviews were conducted with members of the NHS R&D Implementation Methods Programme Advisory and Commissioning Groups. The interviews focussed on the commissioning process and 15/20 Commissioning Group members and 12/19 Advisory Group members were interviewed (there was some overlap in membership). In some instances those interviewed had successfully applied for funding from the IMP and there was also discussion about the impact from their specific project.

Results

Quantitative assessment of outputs and dissemination

Data collection and analysis were informed by the HERG framework for assessing health research payback developed by Buxton and Hanney [10-11] and the various stages of that model are used here to present the quantitative data.

Publications

Attempts to identify publications related to the IMP indicated that, by Autumn 2002, there had been 120 publications that were a specific product of IMP funding. The numbers of the various types of publication are shown on Table 2. Of the 59 articles in peer reviewed journals, 41 are in journals given a journal impact factor by Thompson's Institute for Scientific Information. The journal used most frequently for publication, the *BMJ*, is also the one with the highest journal impact factor of those publishing articles from the programme. The journal most used that did not have an impact factor was *The British Journal of Midwifery*. Although the recent publication dates of many articles reduced the value of citation analysis, some of the publications from projects that completed early already had impressive scores. The article most cited, Coulter *et al*, 1999, had, by Spring 2006, been cited on 131 occasions. An even more frequently-cited publication, *No Magic Bullets* [12], arose from an early commission by the Chair of the IMP Advisory Group, Andy Haines, to assist that Group in its discussion of the issues.

Further research

Table 3 provides details of the 15 projects, with grants of over £1.3 million, that were awarded to IMP researchers by other funders for follow-on studies connected in some way to the IMP. Some non-IMP researchers have also built on the IMP projects.

Research training

One of the difficulties facing the IMP was the lack of research capacity in this field. It is, therefore, particularly important to note that at least nine projects involved research training.

An accepted indicator of such research training is whether it has led, or will lead, to higher/research degrees. [10.13] The degrees obtained by researchers associated with these nine projects include four PhDs and three MDs - see Table 4 which also shows the level of contribution to the research degree that came from the IMP project.

Impact on health policy and practice: views of IMP researchers

The project files revealed extensive claims made in applications about potential users and about the benefits that would flow from the projects. The questionnaire responses received from lead researchers gave the current situation. There were more claims of possible future impact than of existing impact, by a factor of approximately 2:1. This is shown on Table 5. The results are broadly in line with other national NHS R&D programmes [14-16] and suggest that impact on health policy and practice from the majority of the projects has as yet been tentative.

Impact on research, teaching and clinical practice: views of potential users

The responses from the three electronic questionnaires to potential users of IMP research findings were too low to provide results that could be widely generalized. Of course this low response rate could, in itself, be interpreted as a lack of knowledge about the IMP as a whole. There was a better response to the postal survey was sent to midwives. A summary of the figures from the 100 out of 227 questionnaires returned (44%) is shown in Table 6.

The response rate is clearly not sufficiently high to provide figures that can be viewed as properly representative. Nevertheless, they do suggest that there is a reasonably high level of knowledge about the projects. In particular, the project on *Informed Choice Leaflets* [17] was known by more than half of the Heads of Midwifery who replied, and most of them had read at least one of the articles about it. A few respondents pointed out that our evaluation questionnaires themselves had provided a good means of disseminating information about these projects. Given the widespread knowledge about some of the projects, and some of the comments made, it seems reasonable to suggest there is quite a considerable interest within the midwifery profession in the implementation of research findings. This interest would also appear to follow through into practice. About half the respondents claimed that their clinical practice was already being influenced by the findings of some projects, and about two-thirds thought this would be so in future.

One of the problems when interpreting the level of existing and potential impact was the question of what exactly was being referred to when discussing impact in relation to projects from the IMP. It is possible that some replies to the questionnaire related to whether they had been directly influenced by existing research on the substantive topic, rather than whether they had been influenced by the conclusions of the IMP project, which, at a meta level, had examined ways to encourage the implementation of this existing research. Nevertheless, 44 midwives thought that the findings from, for example, the project on the uptake of effective practices in maternity care [18], might in future be used in their unit to influence clinical practice. Other midwives, however, explained why the findings of the IMP studies would not impact on them because, for example: they already knew about the substantive research in question and were already implementing it, or they knew about the substantive research *and* about the IMP findings but lacked the resources required to implement these findings.

Dissemination

Collectively, the dissemination of results from IMP projects was not systematically organized. There was, however, activity by individual researchers at project level, including:

- 92 presentations primarily to academic audiences
- 104 presentations to practitioners and/or service users

Qualitative findings from interviews with Advisory and Commissioning Group members

The interviews focused on the development and commissioning of the research programme, and on the overall influence of the IMP.

An innovative programme – understanding implementation

As research topic, research implementation differs from more clinically orientated research, necessarily involving a wider range of disciplines and methodological approaches. Members of the IMP Advisory and Commissioning groups were aware of the challenge this posed, and intended to be wide-ranging and innovative. But many subsequently felt that they had underestimated the difficulties involved in developing a research agenda in a new and relatively complex field. [6] There were also considerable time pressures. As a result, and despite extensive inter-disciplinary discussion in both groups, a “clinical tendency” remained within the IMP. This had an impact on priority setting and on the research finally commissioned, prompting innovative attempts to develop RCTs to address the complex issues raised by the IMP, but also raising concerns about the lack of real engagement with the social sciences.

Setting and developing priority areas for research

The Advisory Group set 20 priority areas. There was considerable variation between these:

- in some areas it was clear what was needed and what research approaches were available;
- in others more exploratory work was needed; and
- in some areas it was too early to fund anything.

But at the start it was not clear which area was which. The first round of commissioning was, therefore, necessarily biased to what was thought to be achievable. This round was also educational, providing important information about what was possible and what research capacity was available. [19]

Commissioning research - composition of the Commissioning Group

Interviewees praised the way the Commissioning Group had been encouraged to approach the complex tasks it faced. But they also drew attention to underlying difficulties. Time pressures were often seen as a limiting factor, although a minority of interviewees actually thought these had been beneficial, helping to focus minds. A more fundamental pressure was the dual requirement to assess both the quality of research applications *and* their relevance to the NHS. Those best able to undertake the first task (researchers) are not necessarily those best able to undertake the second (NHS commissioners and practitioners). On occasion their views differed, creating tensions in the Commissioning Group.

Commissioning research - interaction with applicants

During the commissioning of research projects it is sometimes necessary to provide support for research applicants, particularly in research fields that are relatively new and/or where the existing research capacity is limited. This sort of assistance was provided in the IMP, whose commissioning processes were more interactive than those employed in previous national programmes [20], and was seen by applicants as being valuable. But there were differing views on the Commissioning Group about the form this interaction should take.

Commissioning research – avoiding bias and conflicts of interest

A “clinical tendency”? The IMP was the first programme within the NHS R&D programme to look at change and management. Members of the Advisory and Commissioning Groups agreed that a wide range of research approaches was needed in this field, but there were differing views about what this meant. Some thought that people with skills in the social sciences should be available to support those doing trials on guidelines; others saw a need to draw on existing bodies of knowledge in various social science disciplines and integrate them with NHS issues. Some thought it important to develop qualitative methodologies; others identified a raft of issues about the development of RCTs which led to considerable methodological gains, and also to attempts to stretch this approach (too far some thought) to cover the many complex questions raised by the IMP. The IMP did not resolve these issues, but it did raise them and so helped to promote what has subsequently become a fruitful debate.

In the event, many of the research projects funded by the IMP were systematic reviews or RCTs, or pilot studies for the latter. [20] Interviewees agreed, however, that this did not reflect undue bias. Reasons given for the tendency to fund this sort of work included:

- the poor quality of many of the qualitative applications

- concerns about generalisability. Research results in the social sciences can have a general theoretical applicability, but the generalisability of the results of clinical trials was, on the whole, more familiar to and hence more clearly understood by members of the Commissioning Group
- a related “*failure to embrace complexity*”, a tendency to go for known and more mechanistic approaches and not to pursue complex questions in unfamiliar territory;
- the need for research teams working in this field to have good links with the NHS; existing teams of clinical trialists had these links already;
- the fact that, as one interviewee put it, “*medics tend to favour RCTs*”.

Conflicts of interest

Given the need to involve researchers in research commissioning and the limited pool of people available in some fields, it is not uncommon (as happened in this case) for Commissioning Group members to submit applications to their own programme. As long as due process is followed and fully recorded (as happened here and is standard practice) this is not a problem.

Need for a communication strategy

The need to identify the potential users of IMP research was clear from the outset. In this field it was seen as particularly important. An Advisory Group briefing paper put the position clearly: ‘As the Advisory Group is concerned with implementation presumably it should set something of an exemplar role in the active communication of its own work’. [6] But in the end the dissemination of results from IMP projects was not systematically organized. The efforts made by the Commissioning and Advisory Groups to identify topics and commission studies in a time-limited programme left little spare capacity for thought about potential users and about a communication strategy for the IMP as a whole. And the subsequent history of the programme (the premature capping of funds and disbanding of the Commissioning Group) precluded a coordinated approach to dissemination.

Examples of important studies

In total 35 projects were funded fully by the IMP and one project, on *Informed Choice Leaflets*, was joint-funded (with the Department of Health). Drawing on the findings from the questionnaire survey to lead researchers, augmented by comments made in interviews, a more detailed account of two studies is provided here to illustrate the type of project funded, and the key findings and outputs.

Case study 1: Availability of information to provide evidence-based patient choice

This was a four stage study conducted by Angela Coulter and colleagues. [21] Its aims were: to investigate the availability of patient information materials about treatment choices for 10 conditions for which high quality systematic reviews exist; to assess the materials in terms of scientific validity and acceptability to patients; to develop guidance on the production of patient information; and to provide practical help to health authorities and health care providers on evidence-based patient choice. The study found that current materials omitted relevant information, failed to give a balanced view of the acceptability of different treatments and ignored uncertainties; many adopted a patronizing tone. It concluded that groups producing information materials must start with the needs defined by patients, give treatment information based on rigorous systematic reviews, and involve multidisciplinary teams (including patients) in developing and testing materials.

Thus, although the study found much at fault with current practice, it also produced clear and positive messages about possible improvements and translated these into practical advice for health authorities and health care providers. These positive, practice-orientated findings had considerable impact. They were actively disseminated by the research team through a series of meetings with potential users, and were subsequently used by the British Heart Foundation to re-write their leaflets. They were also presented in a book, *Informing Patients* [22], which was at one time the King’s Fund’s best selling title: the sales figures of over 1300 are seen as excellent for a book in this category. And, as already noted, the main paper from this research was the most highly cited paper from an IMP-funded project.

Case study 2: Nurses’ use of research evidence in decision making

This descriptive and analytic study by Carl Thompson and colleagues used qualitative interviews, observation and statistical modeling to explore the factors that influence nurses' access to, interactions with, and use of, research material in their decision-making processes in three large acute hospitals. [23] The main finding of the study was that nurses have the potential to participate in evidence-based decision making but that the presentation and management of research knowledge in the workplace poses significant challenges. A considerable educational, research, management and policy response is required if this potential is to be exploited. Specific recommendations cover: training nurses to handle uncertainty rather than to expect certainty; developing evidence-based change agents; organizing and increasing access to the knowledge needed for clinical decision making. There have been a series of publications from the project and it has influenced various courses and educational programmes. In addition it helped to open up the previously under-explored field of research implementation within nursing and provide significant opportunities for further work, including a £339,000 Medical Research Council funded study for Nicky Cullum and colleagues to build on their original work.

Discussion

This evaluation was designed to explore the quality of the outputs of the programme and of the commissioning process, and to see what lessons could be learnt for future commissioning and communication strategies.

Outputs of the programme

As is demonstrated by the examples just given, the IMP funded some useful research projects, some of which had considerable impact against the various factors in the HERG payback model, such as publications, further research, research training, impact on health policy and clinical practice.

Developing and commissioning a research programme - lessons learnt

Setting & developing priority areas for research

The Advisory Group followed the pattern set in previous NHS R&D programmes and set 20 priority areas. In this particular field at this particular time this was probably too many. The field was relatively unexplored, there was little existing research capacity. It would have been better to build the programme more gradually, addressing fewer priority areas in each round of commissioning. In general, complex new research fields such as this would benefit from more preparatory work, lower initial expectations (especially as regards the pace of the programme) and the ability to re-visit and learn from early results.

The role of the commissioning group

When commissioning R&D for the NHS the dual requirement to assess the quality of research applications *and* to consider their relevance to the NHS can lead to tensions. To avoid this, commissioning groups should agree protocols at their first meeting to cover the role and remit of members, taking account of members' differing backgrounds, skills, and experience, and defining the group's relations with external advisors.

Support for research applicants

Some support for research applicants may be necessary in any research programme, particularly when the field is relatively new. But views about the form and timing of this interaction differ. Commissioning groups should discuss this issue before commissioning work, seek relevant evidence about good practice, and, if necessary, draw up a protocol.

Communications

A tailor-made communications strategy was important for the IMP, as the Advisory Group recognised at the start, but one was never set up. At programme level we were told that the IMP did raise awareness of the need to improve the dissemination of research findings (in general) in the NHS. But we did not find that this awareness was reflected in the impact made by individual projects. Most IMP researchers did not feel that being supported by the IMP, rather than funded as separate, isolated projects, had had any effect on the impact of their findings. In contrast, individual projects in other national R&D programmes gained credibility and attention from being part of a wider programme. [15-16] And in these more tightly-specified medical fields a ready-made set of conferences and meetings was also

available through which messages about the programme, and about findings from individual projects could be disseminated. All this was lacking in this case. There is a need for effective communications strategies for future research programmes.

Influence of the programme

At the time it was established the programme as a whole generated considerable enthusiasm among members of the Advisory and Commissioning Groups. And the issues raised in Advisory and Commissioning Group discussions - concerning the scope and nature of implementation research, the appropriateness of different research methodologies, and the need for effective interaction between disparate disciplines - have been debated with increasing vigour ever since. To this extent the IMP has increased interest in, and understanding of, the field.

Twelve years after the IMP was established there is now real dialogue between academic clinicians and the social sciences, and a wider appreciation of the need to use theoretical frameworks from disciplines such as cognitive psychology [24] and organizational studies [25-26] in implementation research. There is a greater understanding of the complexity of research implementation and of the multi-faceted approaches required to achieve beneficial, sustainable improvements in clinical practice. [27] There is a rapidly growing and wide-ranging literature, no longer focused solely on single interventions aimed at the lone practitioner. [1]

There are, however, still difficulties. Publication of research findings on implementation and innovation in peer-reviewed journals can be problematic [28-29]; meta-analysis in this methodologically complex field is extremely challenging [30]; healthcare professionals are often reluctant to accept evidence that has not been derived from a randomized controlled trial [31].

One particular difficulty is the organizational context within which implementation research operates. The IMP was established at a time of large changes within the NHS and the NHS R&D Programme: the internal market, commissioning of services, and GP fund-holding were all new and untested; Regional Health Authorities and their associated R&D Offices were disappearing; and there was radical rethinking of the role of national R&D programmes. [6] As more than one interviewee pointed out to us, continuing change is a major impediment to the successful implementation of research in the NHS. In this respect nothing has altered. If anything the scale and pace of change has accelerated - continuous and rapid change has become endemic in the NHS.

What has altered, however, is our understanding of how continuous change impacts on the service, and on its ability to use good evidence from research. There is recognition of the price to pay in any reorganization, especially in reorganization that is not itself based on sound evidence. [32] And, with the establishment of bodies such as the National Institute for Health and Clinical Excellence (linked to the NHS Health Technology Assessment Programme), and the new NHS Institute for Innovation and Improvement, "NHS buy-in" to the need for a sound evidence-base on research implementation *per se* has improved.

Conclusions

The IMP was an early attempt to develop a systematic programme of implementation research for the NHS. The way in which the IMP was set up and subsequently developed was heavily influenced by the various contexts in which it had to operate - the relatively new NHS R&D Programme, the developing internal market in the NHS, general health policies at the time, and so on. Some individual IMP projects have had considerable impact in their particular fields. The influence of the programme as a whole is less easy to assess. But what is clear is that the IMP prompted important debate about the nature and scope of implementation research that has continued unabated ever since.

Competing interests

The authors declare they have no financial competing interests, but SH was a member of a team that made an unsuccessful bid for funding under the IMP programme.

Authors' contributions

SH played a large role in devising the original evaluation and SH and BS were primarily responsible for conducting the evaluation. BS led on the production of this article and both authors read and approved the final manuscript.

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Table 1: Timetable of selected events connected to the Implementation Methods Programme

1994	Advisory Group founded, chaired by Andy Haines (then Director of R&D in an NHS Region), and supported by 4 workshops, several commissioned papers, and a consultation exercise. The programme budget set at £8 million.
1995	The Advisory Group published 20 priority topics in April. At that time a Commissioning Group established, chaired by Jeremy Grimshaw. The Group issued a first call for proposals in July. Outcome: 32 projects funded, allocated funding £4 million, plus partial support for one DoH project.
1996	IMP funding capped. Commissioning Group disbanded prior to second round of commissioning in 1997.
1997	Second call for proposals in April. Outcome: 3 projects funded in October, allocated funding £800, 000.
2000	Progress report published. Responsibility for IMP passed to National Co-ordination Centre for NHS Service Delivery & Organisation (NCCSDO)
2002	Health Economics Research Group (HERG), Brunel University, asked by NCCSDO to evaluate the IMP. Evaluation report completed in November, and published later (Hanney et al., 2003).

Table 2: Publications from the IMP's 36 projects

Type of publication	Number
Peer reviewed journal article	59
Journal editorial	3
Journal letter	2
Published abstract	15
Book	2
Chapter	11
Non-peer reviewed article	2
Published conference proceedings	6
Publicly available full report	6
Other	14
TOTAL	120

Table 3: The importance of the IMP project to securing further research funding

	Considerable	Moderate	Small	Contribution not recorded	Combined totals
Number of projects where funding known	3	4	3		10
Total amount awarded in each category	£678K	£576K	£60K		£1,314K
Number of projects where amount of further grant not stated	2	2		1	5
Total number of projects	5	6	3	1	15

Table 4: Qualifications gained or expected from involvement in the projects

Qualification	Obtained	Expected	Contribution from IMP project		
			Considerable	Moderate	Small
MSc	1			1	
MPhil	1		1		
MD	3		2	1	
PhD		4	2	2	

Table 5: Lead researchers' opinions about the existing and potential impact of their research (n = 30)

Type of impact	Answers from questionnaires			
	Yes	No	Don't know	Blank
Already impacted on policy	9	15	2	4
Expect to impact on policy	16	11	0	3
Already impacted on practice	8	12	5	5
Expect to impact on practice	17	5	1	7

Table 6: Total figures from postal questionnaire to Heads of Midwifery and university researchers in perinatal care

	Number	% of those returned
Questionnaires distributed	227	
Questionnaires returned	100	
Knew about IMP	35	35%
Heard of at least one project	80	80%
Read an article from at least one project	68	68%
Findings from at least one already influenced:		
a) clinical practice	54	54%
b) research	8	8%
c) teaching	20	20%
Findings from at least one project will influence:		
a) clinical practice	73	73%
b) research	14	14%
c) teaching	24	24%
Findings from at least one project have/will have influenced others	73	73%