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Insights on Impact from the Development, Delivery and Evaluation of the CLEAR IDEAS Innovation Training Model

SHORT TITLE: Innovation training evaluation

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Insights on Impact from the Development, Delivery and Evaluation of the CLEAR IDEAS Innovation Training Model

ABSTRACT

The increasing pressure on organisations to innovate more effectively in what they deliver and how they work means there is a distinct need for interventions that enhance the innovation capabilities of employees. This paper therefore describes insights from the development, delivery and impact evaluation of a research-based innovation training model (CLEAR IDEAS) designed to improve both the idea generation and idea implementation competencies of trainees. How key findings from the creativity and innovation literature were turned into a practical model and its operationalisation in practice are first discussed. This is followed by presenting a longitudinal evaluation of the training intervention with 151 public sector leaders. Findings showed that the model was well received, led to significant improvements in innovation competencies and resulted in certain trainees undertaking a range of actions to introduce innovations back in the workplace while others failed to apply their learning. Longer-term data provided several examples of subsequent notable ultimate impacts on organisations' functioning and public service delivery. Finally, reflections on key training, trainee, task and work environment facilitators and inhibitors of innovation training impact are offered.

Keywords: creativity, innovation, training, impact, evaluation

Introduction

The past few decades have seen innovation, the intentional generation and introduction of potentially useful new ideas, products, services, policies and ways of working into roles, groups, organisations and society (Amabile, 1988; West & Farr, 1990), become an increasingly prominent cornerstone of both national policies and organisational strategies (Anderson, Potočnik & Zhou, 2014; Boon & Edler, 2018; Porter & Ketels, 2003; Staack & Cole, 2017; Knippenberg, 2017). These new initiatives are valued since they can benefit organisational performance in many ways such as helping develop a unique product advantage over competitors, enhancing service delivery, reducing costs, improving efficiency or providing a new strategic direction. Consequently, organisations have sought various strategies to improve employee innovativeness including recruiting more creative individuals, setting up idea capture schemes or rewarding innovation in performance appraisal systems (Burch, Pavelis & Port, 2008; Kirton, 2003). The focus of this paper is in the domain of training strategies and reflections on the development, delivery and impact evaluation of a research-based innovation training intervention called CLEAR IDEAS (CI).

This paper comfortably sits in the ongoing discussion regarding the need to bridge the science-practitioner divide in terms of translating academic knowledge into actionable practice (Anderson, 2007; Arnold, 2017). Practitioners have often lamented the lack of access and perceived impenetrability of academic journals and the desire for literature that is 'practically workable' (Bartlett & Francis-Smythe, 2014). As both an academic and practitioner myself, I have felt the tension between both worlds (Bartunek & Rynes, 2014) but I have had the opportunity to try and connect them. This non-traditional paper offers a narrative perspective on my experiences and will interleave discussions of the relevant work and organisational psychology literature, personal insights and data analysis in order to cover three aims. The first

is to explain the decision-making undertaken as to how research on creativity and innovation could be translated into a practical training model designed for workplace impact. The second is to present evidence from a longitudinal evaluation of the training intervention conducted with over 150 public sector leaders over a number of years. The third is to share lessons learned on factors influencing the impact arising from the intervention using a conceptual framework derived from the training effectiveness literature (Baldwin & Ford, 1988; Ford, Baldwin & Prasad, 2018).

Development of the underpinning research

The author of this paper was a member of the Economic and Social Research Council's Centre for Organisation and Innovation (COI) based at the University of Sheffield, UK, which ran from 1996 to 2006 with a remit to investigate how individual, job, team and organisational practices affect organisational innovation and performance. My specific focus was on identifying the knowledge and skills required by individuals, groups and organisations to innovate and evaluating the effectiveness of creativity training interventions designed to enhance these skills (Birdi, 2005, 2007; Birdi, Denyer, Munir, Neely & Prabhu, 2003; Leseure et al., 2004; Totterdell et al., 2002). COI and others' research produced a number of findings with implications for enhancing innovation in organisations. First, since innovation is a process that covers a range of phases from identification of opportunities, to analysis of problem causes, to new idea production and selection and then implementation of those ideas into practice, organisations need effective capabilities for all stages (Birdi et al., 2003; Birkinshaw, Hamel & Mol, 2008; Leseure et al., 2004; Woolfe, 1994). Problems in any of these facets can seriously undermine an innovation process. Second, it has been shown that different factors affect different phases of the innovation process. For example, individual factors (e.g. motivation, creative ability) have shown a stronger relationship with idea generation while group and

organisational factors (e.g. management support) are more strongly related to idea implementation (e.g. Axtell, Holman & Wall, 2006; Birdi, 2007; Magadley & Birdi, 2009). Third, different sets of skills help with different aspects of innovation (Basadur, Runco & Vega, 2000). Training in innovation therefore seems a logical method of producing the required competencies in individuals and the literature indicates learning creative thinking techniques can improve the divergent and convergent skills needed to analyse problems, generate new ideas and select the best ideas (Basadur et al., 2000; Scott, Leritz & Mumford, 2004). We further found that individuals with greater negotiation and influencing skills are more likely to overcome poor environmental support and get their ideas implemented (Birdi, Leach & Magadley, 2016). Fourth, there are problems with the quality and quantity of innovation learning that employees receive in the workplace (Roffe, 1999). Only a fraction of organisations appear to have some form of training in the domain; within those the emphasis is more on the generation of novel ideas (creativity) to the exclusion of how to also implement those ideas (innovation covers both aspects); and there has been relatively little evaluation as to the impact of these programmes in the workplace (Birdi, 2016; Birdi, Wood & Patterson, 2007; Birdi, 2007; Patterson & Kerrin, 2009; Puccio, Firestien, Coyle & Masucci, 2006).

Having created a rich source of innovation findings, the challenge was to create a knowledge exchange vehicle to translate this understanding to impact on practice in organisations. This was crystallised in a paper I wrote on a creativity training evaluation study in a Government organisation (Birdi, 2005) where I concluded that there was a need to produce a new training model of innovation that would explicitly cover and integrate both the creative/idea generation parts and new findings on the implementation aspects of the innovation process. At the time, existing training models very much focused just on the creativity side of idea generation (see Birdi, 2016; Puccio, Cabra, Fox & Cahen, 2010 for reviews). For example, brainstorming (e.g. Osborn, 1953), producing ideas in a group where

judgement of ideas is done separately from their generation, is probably the most common technique taught in organisations (Sudhaman, Bridges & Strauss, 2012). The focus is on developing divergent and convergent thinking skills but little coverage is given to how those ideas could be implemented at work. A similar claim can be made for other creative thinking training approaches such as synectics (the use of analogies; Gordon, 1961), morphological analysis (the breaking down and recombination of component parts of a challenge; Zwicky, 1961) and lateral thinking (a range of techniques to shift thinking or perception around a problem; de Bono, 1977). The most well-supported approach in the literature is Creative Problem Solving (CPS) which is presented as a series of processes or stages described as mess finding, problem finding, information finding, idea finding, solution finding and acceptance finding (Osborn, 1953; Noller & Parnes, 1972). As can be seen, even with this, most of the focus is on the idea generation side and relatively little detail is given on the implementation aspects in terms what factors need to be addressed. Theoretically, this is echoed in the cognitive creative process models developed by Mumford and colleagues (e.g. Mumford and Gustafson, 1988) where the key processes are described as problem definition, information gathering, concept/case selection, conceptual combination, idea generation, idea evaluation and then the less-considered implementation planning and adaptive execution,

Looking for more insight into what the training should involve, the Scott, Leritz & Mumford (2004) meta-analysis of creativity training interventions was another key touchstone for defining the intervention. The study concluded that the most effective creativity training interventions used a model to underpin the training as opposed to an ad hoc grouping of techniques, used realistic, domain-specific exercises and developed component skills systematically. Other requirements for the intervention I felt were to: identify the crucial evidence-based factors that contributed to effectiveness in different parts of the innovation process; be simple enough to be understood and remembered by any level of employee and

hence encourage inclusiveness in innovation efforts; be applicable to any type of organisation; be practically usable as a method for developing and implementing ideas for new products, services or ways of working; and form the basis of a training intervention where individuals could develop not only the knowledge and skills to engage with different stages of the innovation process but also the motivation and self-efficacy identified as crucial in the literature (Amabile, 1988; Birdi, Leach & Magadley, 2012; Shalley & Gilson, 2004). The initial opportunity to create and deliver such a vehicle (which I named CLEAR IDEAS) arose in 2005 when I was invited to run a seminar on the latest innovation research findings for a team in the BBC. Since that initial event in 2005, over 2000 people from more than 200 organisations in public, private and third sector organisations in the UK and countries as widespread as Sweden, Italy, Hungary, Canada and Brazil have taken part in our workshops. In the next section I discuss the research basis for the model and how it operates in practice.

Explanation of the CLEAR IDEAS innovation training model

Insert Figure 1 here

The training model is summarised by the acronym CLEAR IDEAS, where each letter stands for an important aspect to consider about the innovation process (see Figure 1 for a visual representation used in training). The IDEAS part (Illuminate, Diagnose, Erupt, Assess, Select) concerns the idea generation phase and builds on the creative problem-solving work of a range of researchers who advocate the development of both divergent and convergent thinking skills (Newell & Simon, 1972; Basadur et al., 1982; de Bono, 1992; Osborn, 1963). It goes from opportunity identification and definition to idea generation, assessment and selection. This is typically the domain of 'creativity' training whereas innovation also includes the

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implementation of those ideas to introduce change into the organisation (Scott & Bruce, 1994). The CLEAR part (Commit, Lead, Engage, Align, Review) therefore integrates the findings from COI work and the literature to discuss specific aspects shown to be relevant to successful implementation of ideas. Compared to the other creativity training approaches described earlier, equal weight is given to the application of ideas as to their generation with more detail given in the latter aspect in terms of what to do. The stages of the model are iterative, in that different stages can be moved between as required (hence the 'spiked sun' in Figure 1). For example, engaging with users with regards to a potential solution might show that they would be unwilling to put it into practice and hence we might go back to our assessment stage to pick the next best ideas. By using the CI model as a guide, participants should therefore be able to systematically generate a new concept for a product, service, policy or process innovation to meet a distinct need and with a strategic plan for its implementation.

Insert Table 1 here

Table 1 breaks down in more detail the key activities for each step of the model with regards to how they would be presented in our innovation training intervention and also provides the research evidence rationale for each of those steps (to help readers understand how research insights were translated into practical points). In a workshop, participants would initially be placed in groups of four to six people and they would agree which real-life work challenge to collectively work on. The IDEAS part of the model focuses on idea generation and in a two-day workshop this typically takes up the first day. The second day helps participants develop an understanding of the major CLEAR factors that contribute to the successful introduction of an idea into an organisation. These five factors were chosen to keep

the number to a memorable and manageable level and also because there was strong support from our research and the literature that they were key influences on implementation (see Table 1).

Training evaluation framework and identifying factors influencing the impact of the intervention

By now the model has been used in workshops with hundreds of organisations. The principles of CLEAR IDEAS were based on sound research evidence but how effective is it in practice and has it had any impact? Many of the workshops have had small numbers of participants, varied in timing and content and provided little opportunity for follow-up evaluation. Therefore, the focus of this paper is on the systematic evaluation of a public sector leadership training programme containing a CI two-day workshop since it allowed both quantitative and qualitative data collection over years from over 150 participants.

The impact of the innovation intervention will be explored using Kirkpatrick's four-level framework (Kirkpatrick, 1994), which is still the most popular approach to training evaluation due to its simplicity and practicality (Sitzmann & Weinhardt, 2019). At the time of the framework's development in the 1950s, the training field lacked a sufficiently systematic and shared understanding of evaluation and how to accomplish it. Kirkpatrick therefore undertook organisational research to formulate a methodical categorisation of training evaluation outcomes at four levels. Reactions (Level 1) gauge trainees' opinions of the intervention, typically including its utility and enjoyability, and generally assessed through end-of-course questionnaires. Learning (Level 2) is the extent to which trainees have improved in their knowledge, skills or affective dimensions and can be measured through tests or self-report instruments. Work Behaviour (Level 3) concerns the crucial aspect of transfer and is the extent to which trainees have applied their learning back in the workplace to do things

differently; ratings by self, supervisors and others are most commonly used to address this aspect. Finally, Organisational Results (Level 4) tries to establish whether there are subsequent changes in organisational functioning or performance as a result of the training; the methods used to assess this stage are myriad but include using performance records, observations, interviews and case studies. Although the value of the information is felt to increase as we move up the levels, the complexity and difficulty of obtaining the relevant data also increases. Many organisations restrict themselves to mainly Levels 1 and 2 and there have been calls for more evaluations which cover all four levels (Reio, Rocco, Smith & Chang, 2017). Although there have been various critiques and extended alternatives suggested for the Kirkpatrick framework over the years (e.g. Sitzmann & Weinhardt, 2019: Birdi & Reid, 2013), its longevity and parsimony means it offers a well-established systematic template with which to assess the pathway to impact by collecting data on all four levels of Reactions, Learning, Work Behaviour and Organisational Results.

The final focus of the field study is to unpack the influences on the four levels of evaluation outcomes from the CLEAR IDEAS training course. Training effectiveness research has had a long and storied history in applied psychology (Bell, Tannenbaum, Ford, Noe & Kraiger, 2017). Since we are looking at the impact of a training intervention, it makes sense to use a research framework drawn from that literature as a lens through which to interpret the various types of influences on both Kirkpatrick's short-term (Level 1 Reactions, Level 2 Learning) and longer-term (Level 3 Work Behaviour, Level 4 Organizational Results) outcomes. Baldwin and Ford (1988) produced the seminal approach to understanding impact on training effectiveness by identifying three types of influential factors in their framework. *Training characteristics* relate to variations in how the training intervention is designed and delivered. Key features here include instructional methods, feedback, spacing and duration of training, the training environment and trainer characteristics (Birdi & Reid, 2013; Noe, Clarke

& Klein, 2014). *Trainee characteristics* are individual differences that influence short-term and longer-term outcomes and include aspects such as participants' pre-existing experience, ability, workplace autonomy and personality. For example, motivation and cognitive ability have been shown to be important predictors of better training performance (see meta-analysis by Colquitt, Lepine & Noe, 2000).

When it comes to transfer of training and subsequent workplace impact (Level 3 and 4), *work environment characteristics* become crucial through opportunity (or lack of) to apply the learning in the workplace and social support (Noe et al., 2014). In the latter case, better active support for application from both supervisors and peers can encourage trainees to try out their learning in practice (Birdi, 2007; Massenberg, Spurk & Kauffeld, 2015). Those three dimensions have provided the core of subsequent effectiveness frameworks (e.g. Bell et al., 2017; Birdi & Reid, 2013; Ford, Baldwin & Prasad, 2018; Tannenbaum, Cannon-Bowers, Salas & Mathieu, 1993) and will therefore provide the basis for the analysis in this paper, However, we should also add the additional fourth dimension of the learning *task characteristics* (drawn from the Tannenbaum et al., 1993 model). For example, fidelity, the cognitive similarity of training tasks to work tasks, has been shown to influence transfer (van der Locht, van Dam & Chiaburu, 2013) and this is quite relevant to the CLEAR IDEAS training approach; the study provides an opportunity to explore other task features that may also emerge as important. In summary, the field study therefore aimed to evaluate the impact of the training intervention according to Kirkpatrick's four outcome levels of Reactions, Learning, Work Behaviour and Organisational Results and identify the different training, trainee, task and work environment characteristics that influenced those outcomes.

Method

Organisational Context

The CLEAR IDEAS model has often been used as a standalone training intervention but in this case it formed part of a larger leader development programme. The Sheffield City Region Leaders Programme (SCRLP) was developed collaboratively by the University of Sheffield and Sheffield Hallam University with the aim of improving public service delivery in the Sheffield City Region. Its aims were to improve the leadership, management, innovation and research skills of current and future leaders. As part of the 60-credit programme, I designed and conducted a two-day, 10-credit module on innovation using the CI model. This was the first module on the course (later modules focused on systems thinking, customer-centrism and financial management).

The participants were chosen by their organisations on the basis of them predominantly being in middle-management public sector roles with the potential to ascend to senior and top management. The module format was that participants were randomly put into multi-agency groups of four to six individuals who in the main had not worked with each other before. It should be stressed that these were temporary teams created for the purpose of collaborative learning on the module.

Day 1 of the module started with a short overview of research on creativity and innovation so participants had an understanding of the field from which the model arose. This was followed by a general description of the ten steps of the CLEAR IDEAS model and how they fit together. Table 1 provides more detail on the activities subsequently undertaken by the groups to learn and apply the model but a brief summary will be given here. The groups chose a real-life organisational problem facing one or more of their number to work on e.g. how to improve knowledge sharing between agencies, increase utilisation of public buildings or enhance the cost-efficiency of public services (Illuminate). They then went through the Diagnose stage (identifying and prioritising the most critical causes) and Erupt stage (learning

creative thinking techniques to generate novel ideas to tackle critical causes). Finally, the groups scored the quality of their ideas against standardised criteria (Assess) and the strongest ideas were formed into their proposed innovation (Select).

Day 2 focused on developing an implementation strategy for their proposed innovation. The morning was spent explaining the Commit, Lead, Engage, Align and Review (CLEAR) steps of the model with associated exercises. After lunch, groups prepared and deliver a ten-minute pitch to the rest of the class so that they could practice selling their innovation in a safe environment with feedback from others. The module finished outlining the requirements for the post-course group assignment due in six weeks and completion of the post-course questionnaire.

A social learning / behaviour modelling approach was taken to the exercises in the workshops since research shows it is an effective way to develop skills (Bandura, 1977; Taylor, Russ-Eft & Chan, 2005). This approach involves the instructor demonstrating to learners how to carry out an activity, then providing them with a chance to practice that activity while receiving feedback from the instructor on their performance. In this context, teams were shown, using examples, how to apply each of the CI steps to develop a creative solution and plan for its implementation. Insights from research and case studies were briefly discussed in each step and then guidance for particular activities given. While teams were working on a task, the facilitator visited each team to check they understood the activity and also provide formative feedback in terms of what was being done well and what could be improved.

Participants

The SCRLP ran for four years and involved eight cohorts, each comprising between 14 to 23 participants. This provided a total number of 173 employees from eighteen separate organisations (including councils, emergency services, health organisations and educational

institutions). End-of-course questionnaire data was collected from 151 participants (87% of the population) which showed that 89% were already in supervisory roles, 48% were female and the mean length of organisational tenure was 11.49 years. Participants came from a range of public sector organisations including councils, the National Health Service (NHS), emergency services, educational institutions and Government Departments in the region.

Evaluation Design and Measures

As mentioned previously, Kirkpatrick's (1994) four-level training evaluation framework was used to analyse the effectiveness of the CI intervention. Below is outlined how a combination of questionnaires, work assignments, interviews and other evidence-gathering methods were used to collect data for the different levels.

Level 1 Reactions: An anonymised questionnaire was given to participants at the end of the two-day workshop (Time 2 – T2) in order to gauge overall reactions to the programme. Using the recommendation of Warr, Allan & Birdi (1999), the three reaction dimensions of perceived training *utility* (measured by: "The module was of practical value to me for my job"), *enjoyment* ("I enjoyed this module") and *difficulty* ("I found this module difficult to understand") were assessed using five-point Likert scales (where 1 = Strongly disagree to 5 = Strongly agree). For the first year of the course, open-ended questions were also placed at the end where trainees could comment on their favourite and least useful parts of the course.

Level 2 Learning: Again following Warr et al (1999), a tailored self-assessment of innovation competencies was used as a metric to assess learning. The aim of the self-assessed competencies was to directly tap into the dimensions covered by the CLEAR IDEAS steps since those were the focus of the training. Hence, by definition, a new bespoke measure of the

competencies needed to be created since they did not already exist in the literature. One item was therefore created for each of the CLEAR IDEAS steps (Assess and Select were combined into one item). The end-of-course questionnaire therefore asked trainees to rate their level of competence in the nine innovation skills targeted by CLEAR IDEAS both at the end of the training (T2) and also retrospectively in terms of how they would have rated themselves before the workshop began (T1) in order to assess any meaningful change in learning. When it comes to training interventions, the use of retrospective self-evaluations for assessing changes in self-rated learning type dimensions (here rated via trainees' ratings of their own competencies) is a recognised strategy for dealing with 'response shift'. Berger, Gunto, Rice & Haley (1996) describe response shift as the phenomenon whereby trainees recalibrate their scales by altering their internal standards as a result of the training intervention. Simply put, trainees' interpretation of creativity and innovation competencies may be different after training compared to before. Hence, using retrospective self-evaluations deals with the issue of response shift by allowing trainees' to use the same internalised metrics for pre- and post-training ratings comparisons.

All nine competency items were assessed using a five-point Likert scale (where 1 = Not at all competent i.e. no awareness to 5 = Extremely competent i.e. can train others). Four items covered the IDEAS *idea generation competencies* (Finding new opportunities for innovation; Analysing the causes of problems; Generating new ideas; Assessing the strengths and weaknesses of ideas). Five items were used to cover the *idea implementation competencies* (Motivating others; Leading an innovation; Engaging users and stakeholders; Aligning systems and resources for delivery of new initiatives; and Planning to implement your ideas). Confirmatory Factor Analysis using SPSS showed that the proposed two dimensions of idea generation competencies (IDEAS components) and idea implementation competencies (CLEAR components) provided a good fit to the data for the pre-training measures compared

to a one-factor measure (two factors: RMSEA = .08, CFI = .94, TLI =.90; chi-square = 49.49, df =26, p<.01 compared to one factor: RMSEA = .10, CFI = .90, TLI =.83; chi-square = 67.83, df =27, p<.01). A similar preferable two-factor fit was shown with the post-course ratings (two factors: RMSEA = .00, CFI = 1.00, TLI =1.02; chi-square = 21.35, df =26, p>.05 compared to one factor: RMSEA = .06, CFI = .97, TLI =.94; chi-square = 39.59, df =27, p>.05). Reliability for idea generation was .77 at T1 and .75 at T2 and for idea implementation was .77 at T1 and .80 at T2.

The construct validity of the scales was tested in a separate sample of 155 police officers who underwent a similar two-day CLEAR IDEAS training workshop. A slightly expanded version of the scale was used this time (three items for generating new ideas rather than one but all other items the same) and the Confirmatory Factor Analyses again supported the two-factor version as a better fit than the one factor version for both retrospective pre- and post-training versions. A final test of construct validity using the same police sample showed that the pre-training competency measures were both significantly related to Janssen's (2000) commonly-used innovative work behaviour scale (r = .37, p<.01 for idea generation, and r = .56, p<.01 for idea implementation); theoretically these should be related and hence convergent validity was also demonstrated.

As a validity check that changes in innovation competencies were not just a general tendency for participants to assume everything improved after training, we also included a two-item scale on technology skill ("I am good at working with technology"; "I find computers easy to use") assessed on a five-point Likert scale where 1 = Strongly disagree to 5 = Strongly agree). Since technology was not the focus of the training, we would expect no significant change in this dimension; this strategy was developed later in the programme so this scale was only used on one cohort and therefore respondents were limited to 20 for this scale. Reliability for technology skill was .90 at T1 and .96 at T2.

A formal assessment of group learning was also gathered. At the end of the workshop, participants were set the task of submitting a 3,000-word *group assignment* in six weeks' time explaining the challenge they had been working on during and since the module and a critical reflection on how the CI model had been applied to both develop a potential solution and plan for its implementation (Sections 1 and 2). The assignments were marked out of 100% according to appropriate application of the model, critical thinking and use of academic evidence.

Level 3 Work Behaviour: The group assignment described above also contained a non-assessed Section 3 asking participants to describe any impact in terms of *actions* that had arisen for the target organisation or for the group in that time as a result of using the model; this section was typically two or three paragraphs long. For the purposes of this paper, a content analysis was conducted by an independent post-doctoral researcher on data drawn from the assignments. For each assignment, the initial statement outlining the problem or challenge being tackled by using CLEAR IDEAS and the final Section 3 on subsequent impact were copied and pasted into a separate table. The researcher then coded the types of challenges/problems that were addressed by each group assignment and the impact Section 3 to categorise the type of resulting actions that had taken place. The results were discussed and agreed with the author of this paper. Subsequent analyses by the author split the assignments into those groups who had taken at least one action after the course (action groups) and those who reported no actions (no-action groups). For the action groups, I read over the Section 3 text again to summarise and categorise any particular influences on work behaviour impact according to the aforementioned four dimensions of training, trainee, task and work environment characteristics. For the no-action groups, less text was written but I attempted to infer from their statements any reasons for actions not being undertaken, again using the four characteristics.

Level 4 Organisational Results: In the UK, every six to seven years all Universities are required to participate in the Research Excellence Framework (REF) audit. This audit exercise gauges the quality of the research produced by institutions and one of the assessment criteria concerns the impact of research-based initiatives and interventions. The University of Sheffield therefore provided some resources to develop an Impact Case Study for the REF based on the CLEAR IDEAS training. This provided a welcome opportunity to gather longer-term follow-up data on promising examples from the SCRLP to ascertain if there had been any impact on Organisational Results. In order to investigate these longer-term outcomes, the impact statements at the end of the assignments (Section 3) submitted in Level 3 were examined by me to identify several case studies that could potentially have most lead to subsequent changes in organisational functioning. Authors of these promising case studies were then contacted again to ascertain progress and for six examples of organisational impact, participants were both willing and able to provide further information. Interviews took place from two months to up to three years after the training workshop. Supporting documentary evidence such as minutes of meetings or policy documents was also sought where available. Again, the data was used to identify any factors inhibiting or facilitating impact. The time frame for this level was between one to three years after participants had taken part in the SCRLP.

Results

Insert Table 2 here

Table 2 shows the means, standard deviations and correlations between the questionnaire Reaction and Learning variables.

Level 1: How did participants react to the CLEAR IDEAS innovation training intervention?

Analysis of the end-of-course questionnaire (T2, n = 132) showed very positive reactions from participants: out of five, utility had a mean score of 4.48, enjoyment was rated 4.61 and perceived difficulty was only 1.83 (meaning delegates found it reasonably easy to understand the training). For the first year of trainees (n = 62) where qualitative comments were sought, the views expressed on the questionnaire supported the positive figures e.g. "The whole module was excellent linking theory with practice". The most popular features were certain creative and analytic thinking techniques and working in groups with people from other agencies. Few people offered suggestions for improvement and where they did, this focused on making the module longer and spending more time on the practical exercises. Table 2 shows that the trainee characteristics of gender, supervisory role and tenure were unrelated to the reactions.

Level 2: Did the intervention improve the innovation learning of participants?

Paired sample t-tests from the questionnaire data showed significant improvements in self-reported learning of both idea generation competencies (Pre-module T1 scale mean = 3.06, Post-module T2 mean = 3.99; t = -23.88, p<.001) and idea implementation competencies (Pre-module T1 scale mean = 3.19, Post-module T2 mean = 3.82; t = -17.59, p<.001; n = 132 for all tests). It should be noted that participants came into the course already with reasonable levels of skills but this should be expected since the vast majority were in leadership roles where they would have been called on to use their innovation skills. In contrast, the technical skill measure showed a little improvement but this was not significant enough by the end of the course (Pre-module T1 scale mean = 4.08, Post-module T2 mean = 4.42; t = -2.05, n.s.; n =20). Furthermore, the marking of the group assignments submitted six weeks after the module showed that all groups comfortably surpassed the pass mark of 50% (the range of marks was from 64% to 86% with a mean score of 75%), indicating that participants had learned the core principles of how to apply the model.

Level 3. Did the intervention lead to any work behaviour changes in organisations?

The content analysis undertaken of the 42 group assignments submitted six weeks after the module showed that there were four main types of problems the projects focused on: improved organisational efficiencies (15 assignments), supporting organisational change (13), improved service user engagement (11) or improved service quality (3).

Most (28, 67%) out of the 42 teams reported evidence of actions having been taken in their organisations as a result of the workshop. Often multiple actions were conducted on a project within the timeframe. Where a project was focused on one organisation then meetings with senior management (15) or an identified project sponsor facilitated actions being progressed. Where the project spanned different agencies and service providers then Board Level support (4) was secured. Revised services were sometimes piloted (2) as a means to gauge stakeholder feedback and market research undertaken (5). In many cases service policy reviews were undertaken (5) and a business case to be presented and project mandates were developed as a result (3). Database development (4) was sometimes part of the implementation plan and often this development was centralising information for multi-agency access, identifying gaps in service, or to facilitate cost analysis. The attendees also described subsequent workshops they had hosted (5) to stimulate innovative thinking on stubborn issues. Overall, the participants' reflections indicated that the model was recognised as a useful vehicle to build a culture of innovation and to enable collaborative creative problem solving. Some also felt that a stronger user focus was now being taken in the review of policies and when services were restructured.

Quantitative and qualitative comparisons using the four dimensions of influence were conducted between the fourteen teams that reported no subsequent actions and those twenty-eight above that had reported at least one action. With *trainee characteristics*, t-tests showed

no significant difference in terms of team size (ranging from three to six; mean for action teams = 4.11 and mean for no-action teams = 4.21; t = .53, p>.05) nor grade given on the assignment (mean for action teams = 76% and mean for no-action teams = 73%; t = -1.7, p>.05) on whether actions were taken. Since the training questionnaire was anonymised, reaction and learning data could not be matched to the team level so qualitative comparisons could only be undertaken with the other three dimensions. A few comments from the action teams mentioned that the *training characteristics* of providing an integrated innovation model with a practical framework for application, which they had practiced, gave them the impetus to try out the process again (e.g. through running focus groups using the methods learned) and share the learning with colleagues. One participant commented: "I also thought that it provided a really good framework, so that module hung together really well, and I came away with a very practical tool and framework, and confidence in how I would deliver that which I subsequently have on quite a few occasions".

In terms of *work environment*, none of the no-action teams reported getting senior management buy-in for their project (and there was little evidence they had tried to) whereas fourteen of the action teams had done so. Furthermore, many action team assignments also talked about cultivating champions and engaging different stakeholders as a means of generating more social support. The opportunity for application was enhanced in many action teams by them ensuring their project ideas aligned or integrated with existing ongoing work on redesigning processes and services in the organisations. Comments by participants also reflected on current levels of re-organisation and upheaval in their workplaces that made it difficult to gain traction for new initiatives. Finally, with regards to the project *task characteristics*, in cases where no action was taken after the workshop in the specified timeframe, this tended to be on projects with the widest remit, with objectives that were broad

and vague or that lacked a strong enough business case. The issue of too short a timescale to report any impact was also given by some of the no-action teams.

Level 4: Did the intervention lead to any changes in organisational results?

By engaging in follow-up discussions with participants and seeking documentary evidence, we tried to assess whether there had been any longer-term impacts on organisational functioning.

Insert Table 3 here

Table 3 illustrates six notable examples of impact attributed to CLEAR IDEAS that were found in each of the main types of public sector organisations that took part in SCRLP. These demonstrated how significant organisational impacts were achieved by people applying the CI principles to a work-related problem in either workshop/group activity formats with colleagues or individually using them to structure their development of a new initiative. For instance, leaders of a Communities Portfolio in a City Council carried out CI workshops themselves to deal with the challenge of redesigning an adult social care service. Two years after the workshops, the final service was launched and the Council estimated it had saved the organisation £1.7m by reducing the number of formal assessments conducted, with a clear attribution of the ideas and strategies generated by the model contributing to this outcome. In a Fire and Rescue service, new strategies for replacing smoke alarms and communicating road safety to young people were developed. Further CI workshops were conducted with over 100 officers and staff in a Police organisation and reported impacts from these included developing more efficient briefing, drugs disposal and ticketing system strategies. We also found improvements in a medication regime in a National Health Service Children's Hospital and a Forestry organisation used the approach to bring in more private sector partners. The scale of

some of these financial impacts suggested a positive overall return on investment (ROI) from the running of the course (Phillips, 1991).

Analysis of the interviews undertaken with trainees in evidencing the development of the above impact shed light on the factors influencing longer-term organisational impact. For *trainee characteristics*, the motivation to set up a series of meetings to progress the application of the methodology and project ideas seemed crucial. For example, the Council case study participants set up monthly 'Think Aloud' creativity sessions to work on challenging issues. The participants here were also senior enough to have autonomy and control over decision-making to ensure progress was continued (the Forestry example participant was the Director of the organisation). One potential inhibitor for continued progress was that several of the participants changed job role during the period of impact. With *training characteristics*, the value of having tools to help transfer (e.g. a CLEAR IDEAS workbook document that could be reused for different challenges) and the flexibility of running shorter and longer versions of the workshop with others were noted. Interestingly, the examples also showed how impact could arise from using the whole model or picking certain steps that most fit the organisational need at the time.

It was also clear that the *task characteristics* that led to these significant impacts involved strategically important challenges that the participants were required to respond to in their professional roles. For example, the Council case study participants were a leadership team that had been tasked with reducing the budget in an adult social care service and hence used the CI approach to tackle the issue. Again, with the *work environment*, senior management buy-in was crucial to the success. A clear difference from the work behaviour assessment phase was that all these successful case studies took place predominantly in one organisation. It appeared that the challenge of cross-organisational collaboration often proved too much in the end; as one participant noted: "It is also important to acknowledge that significant barriers exist

to implementation, not least because of the traditional separate budget and asset heritage of the organisations involved. Therefore, such a shared approach will require significant cultural change for each organisation." Our participants were proactive in creating networks with other trainees and also sharing that knowledge with others in their organisations, enabling the start of a more innovative cultural shift among colleagues. These shared experiences were felt to help the initiatives gain traction.

Discussion

This reflective paper on impact set out to outline the research basis for the CLEAR IDEAS innovation training intervention and describe a field study assessing its effectiveness using Kirkpatrick's (1994) four-level training evaluation framework. The results of the evaluation indicated that the intervention was effective in a number of ways. In the short-term, reactions of trainees were quite positive, while the learning data indicated significant improvements in both targeted idea generation and idea implementation competencies by the end of the training. In the longer-term, analysis of module assignments indicated that six weeks later the majority of groups on the course had started to transfer their learning to the workplace. Examples of changes in work behaviour included a range of actions from meetings with senior management and board-level members to participants running their own workshops and undertaking pilots to take their CI plans to fruition. However, a third of the groups at the same time point failed to report any tangible actions. Tracking several of the initial assignments and participants indicated that months to years later the training had led to a number of examples of organisational results impact either through progressing the challenges addressed in the leadership module or by applying the CI module to new challenges. Although this only represented a small proportion of participants, the scale of improvements for their organisations

was substantial (in one case contributing to £1.7m savings in one year). The proposed pathway to impact in terms of creating a training intervention to enhance the innovation competencies of participants in order to help them generate and implement more successful innovations for organisational benefit therefore found support in some cases. Exploration of the evidence also highlighted various influences that accelerated or dissipated workplace application despite trainees having achieved a good level of learning on the course. Table 4 offers an integrated summary of insights into the factors that were felt to have helped and hindered this route to impact. These will be discussed according to the four dimensions of influence commonly used in the training effectiveness literature: training characteristics, trainee characteristics, tasks characteristics and the work environment (e.g. Baldwin & Ford, 1988; Ford, Baldwin & Prasad, 2018).

Insert Table 4 here

Training characteristics

Of course, basing the CI innovation training intervention on the extant creativity and innovation literature provided a solid base and credibility for the approach advocated in the workshops (and this was welcomed by participants). I would advise researchers to be rigorous in their exploration of a topic as it took at least six years of literature reviews and empirical studies within and across organisations before I felt knowledgeable enough to pull out the key principles underlying the model. It is also important to take a multi-disciplinary perspective on phenomena such as innovation. Psychology only offers certain pieces of the 'innovation jigsaw' and valuable insights for real-world organisational impact were gained from working with management, sociological and economics scholars (e.g. Leseure et al., 2004). Undertaking extensive research of course generates lots of information hence it is crucial to prioritise those

factors shown to have been most influential, either through consulting existing literature reviews and meta-analyses or generating your own critical assessments. The prioritisation of the factors then needs to be translated into a coherent vehicle that is accessible to non-academics. If a picture paints a thousand words, then a good model can cover a few thousand more. You should be aware this needs to represent a trade-off between comprehensiveness and practical utility.

A number of strategies were used to ensure the framework arising from the research was memorable, usable and engaging. First, the creativity training recommendation of Scott et al. (2004) to provide a model which captures all stages of the creativity process was incorporated into the acronym and mnemonic of CLEAR IDEAS which focused the training on ten key points. The importance of translating academically technical language and constructs into concepts accessible to a wider population cannot be underestimated. Second, an evidence-based training paradigm, behaviour modelling (Bandura, 1977; Taylor et al., 2005), was usefully adapted but this highlighted a practical constraint in terms of limiting the participant numbers in order to allow sufficient monitoring and feedback.

Third, the workshop involved extensive learning through collaborative group-work. This allowed the sharing of experiences and new perspectives between participants and the development of peer support relationships that helped later transfer of the training; we found some of the cohorts were still in contact with each other many years later. Fourth, the value of conducting a module on an accredited course meant that a follow-up assignment could be set which provided a beneficial goal-setting focus for participants to reflect on their learning and application of their innovation in practice (Latham & Locke, 2006). A major evaluation issue is the difficulty in getting participants to respond post-course so including a non-assessed section in the assignment allowed the gathering of potential impact avenues. Fifth, trainees were provided with an electronic version of a CLEAR IDEAS workbook (a Microsoft Word

document) that they could use for new challenges after the training and the provisions of this tool helped them remember and apply the framework more easily than just relying on their notes and lecture slides. After the completion of the SCRLP, we used this type of feedback to develop interactive CI apps which trainees could then use back in the workplace as a more dynamic way of reminding them of the model steps. To date, we have over 350 registered users for our online CI app from as far afield as Iceland, Malta, Russia and Canada.

A final point here is the value of providing continued post-workshop support. In some cases, I was asked to provide later tailored advice to certain participants plus run shorter versions of the workshop for other organisational members. This led to some of the organisational results impacts described in Table 3. However, a shortcoming of the intervention described here was that there were no systematic follow-up booster sessions built in for all trainees and this was considered a negative by participants; it may well have been a contributor to the lack of application in some cases. This supports other training transfer research which demonstrates the value of follow-up activities (Tews & Tracey, 2008).

Trainee characteristics

The positive reactions to the utility of the training indicated trainees showed a good level of motivation to transfer their learning and this has been shown in training research to relate to actual changes in work behaviour (Grohmann, Beller & Kauffeld, 2014). However, a potentially more important factor was that the vast majority of participants were in leadership positions where they had the autonomy and authority to actually try out some of their ideas. Opportunity to apply learned skills has been demonstrated to be a key influence on transfer of training (Baldwin & Ford, 1988) and in this case we can say that leaders were often able to create the opportunity themselves. CI workshops I have conducted elsewhere have sometimes

struggled to have impact because the participants have generated very useful ideas but were too junior to authorise their solutions.

Other barriers included situations where no participants had clear ownership of the challenge and hence there was no responsibility for its implementation or where other objectives took priority. This then also linked to reasons of lack of time or motivation to progress ideas. The implication here is that more time could have been spent in advance of the workshop identifying both key challenges to work on that were strategically important for the organisations concerned and also clarifying which participants would be responsible. Furthermore, participants had been placed into multi-agency groups just for the purposes of the course so afterwards there was sometimes no natural 'team' justification that required them to belong and work together. More traction was also generated where trainees made the effort of sharing their innovation learning with colleagues who could then in turn provide more practical and social support. An inhibitor of impact of training projects was the common occurrence of people changing job roles and hence initiatives losing momentum – the more complex and hence time-stretching the innovation, the more likely this was to occur.

Task characteristics

Fidelity, the extent to which the training replicates the real situations in which the learning should be applied, is a good predictor of transfer (Druckman & Bjork, 1994; van der Locht, van Dam & Chiaburu, 2013) and was in this case aided by asking trainees to work on developing an innovative solution to a real-life challenge facing them at work (as opposed to providing them with a simulated generic example). It also helped that these challenges were chosen to be strategically important to the organisations that trainees came from and hence motivated them to engage with the task in a more involved manner. Coupled with this, more success was seen where innovative ideas developed by trainees were subsequently aligned or

integrated with service redesign work that was already being undertaken. Analysis of the assignments where no follow-up actions were taken suggested that this could have been because the scope of the real-life challenge they chose to tackle was too broad or vague or there was not a strong enough business case to take it forward. It was also apparent that innovations were more likely to be applied where there was clear ownership or accountability for the task; where this was absent, post-training progress was more likely to be inhibited. Interestingly, the Level 4 organisational results impact cases described were all tasks that belonged to one particular organisation as opposed to shared across multiple agencies.

Work environment

Levels of post-training social support have long been demonstrated to influence the transfer of training (Baldwin & Ford, 1988; Massenberg, Spurk & Kauffeld, 2015) and this came through as a strong theme in two ways in this study. First, senior or top management buy-in to the proposed innovations was a clear common thread in the successful cases of application as the scale of what was being proposed by trainees often needed high levels of authority to sanction it. Second, peer support became a strong factor as trainees connected with other trainees in their organisation and partner organisations and also shared their learning with their colleagues. This helped generate a cohort effect where the creative approaches that were being tried back at work gathered a more positive reception since there were others with a similar mindset. Birdi (2007) found a similar pattern in evaluation of different types of creativity training where departmental climate for innovation significantly influenced the implementation of trainees' ideas. A final contextual point to contemplate is that at the time the UK public sector was under a period of austerity where the focus was very much on short-term cost-cutting measures. Some participants fed back that their creative ideas for investing more now in order to generate future savings or service improvements therefore failed to gain traction from top management in their

departments; under less stringent conditions, they felt there would have been progress in their application. Taking time to understand the wider social, political and economic contexts into which organisational interventions are to be introduced is therefore recommended as they can majorly attenuate impact. This could be done through having discussions with a cross-section of informed stakeholders inside and outside of target organisations, as well as using reports and media coverage.

Limitations and future directions

Of course, the findings of the evaluation study need to be considered within several limitations. Standardised individual evaluation measures were only used at the reactions and learning levels using self-report measures while work behaviour was examined in terms of statements in group assignments. Future evaluations therefore should also collate pre- and post-training measures of individual innovative work behaviour in terms of idea generation and implementation. More objective and standardised measures of innovation knowledge and skills tests could be used too. Furthermore, the use of a control group would help clarify the extent to which changes are due to the training itself. The evaluation of creativity and innovation training programmes at the organisational results level is difficult as it is hard to predict in advance where organisational actions and consequences will emerge. Our impact activities were conducted with limited resources and it took months (or years in some cases) to gain the evidence for the several examples described here. Hence, it is important to plan for sufficient long-term resources to capture these outcomes. The importance of maintaining relationships with participants and organisations for an extended period after the course also became apparent. This effort meant, however, that we were not able to follow-up all participants to clarify if any longer-term impacts had emerged (or why not) and this is something that needs to be built in subsequently. By focusing on successful results of application at the Organisational Results

level for the purposes of the REF audit, we were by definition more able to identify factors influencing greater effectiveness and less on those that led to failure. Since the CI module was part of a wider leadership development programme it could also be argued that other parts of the programme were the key influence on the impacts described. However, the module was the first one on the course and we were careful in our evidence-gathering to clearly ascertain how the model led to the impacts described in practice.

In conclusion, this paper set out to add to the general discussion about creating impact by sharing one particular experience of trying to bridge the divide between academic research and real-world practice (Bartunek & Rynes, 2014). It described how a confluence of creativity, innovation and training research was knitted together to create a practical knowledge exchange vehicle in the CLEAR IDEAS innovation training intervention. Implementation of the intervention in a leadership development programme allowed its effectiveness to be gauged at different levels and showed the variability of its impact was influenced by a range of training, trainee, task and work environment characteristics. This knowledge of impact in practice should be the basis for driving further research and in turn further practical interventions, producing a virtuous cycle of continual engagement between the two worlds.

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Table 1. Description of how the CLEAR IDEAS innovation model works in practice and the research rationale behind each step.

Step name	Key activities	Research rationale
ILLUMINATE	Choose a real-life challenge that requires an innovative solution.	As a means of widening participants' perspective of what innovation is we start off by discussing how innovation does not just cover new products and services but also changes in other aspects of organisational functioning (Birkinshaw et al., 2008). For example, a COI study by Totterdell, Leach, Birdi, Clegg & Wall (2002) of 513 UK organisations found that process innovations described by organisations could be categorised into four major areas of changes in organisational structure, HRM systems, new technology or work management systems. Considering these points, participants are encouraged to identify a strategically important organisational challenge (problem or opportunity) that requires innovating that they want to work on during the workshop (this is phrased as 'How do I/we…?').
DIAGNOSE	Identify the different drivers of the challenge and then prioritise the strongest drivers that need to be dealt with creatively.	In this stage we convey the need for participants to define and analyse the initial challenge for innovation in order to generate a clear understanding of specifically where creativity really is required. Participants are therefore introduced to cause-and-effect analytic thinking techniques such as Fishbone Analysis (Majaro, 1988) and The Five Whys (Swanson, 1995) to help people first map out the different drivers/causes of the problem or issue that needs innovating and then prioritise which of the main drivers or causes need tackling first. This develops the convergent thinking skills advocated by Basadur et al., (1982).
ERUPT	Generate lots of new ideas to deal with the prioritised drivers.	Participants in this stage are given space to generate a large quantity of novel ideas to meet the prioritised innovation need and develop their divergent thinking skills. Typical blocks to creative thinking are discussed and then participants are introduced to major categories of creative thinking techniques such as brainstorming (Isaksen & Paulin, 2005; Osborn, 1963); morphological analysis (Zwicky, 1969); synectics (Gordon, 1961) and lateral thinking (de Bono, 1977). Demonstrations of each of these techniques are given by the facilitators and then participants are encouraged to generate as many ideas as possible by trying the different techniques. Participants are told during this phase to separate generation of ideas from judgement of ideas (which comes in the next phase) and to capture all ideas in writing. Depending on time, a range of different techniques are offered so that individuals can have a repertoire of creative thinking strategies to draw on to suit personal preference and task requirements.

Table 1. Description of how the CLEAR IDEAS innovation model works in practice and the research rationale behind each step (continued).

Step	Key activities	Research rationale
ASSESS	Systematically score the quality of the generated ideas against contextually-relevant criteria.	Dedicated time is given to evaluate the viability of the ideas against organisationally-relevant criteria. Participants are asked to produce three criteria by which their own organisation would judge the worth of an idea (e.g. time to produce product, cost, potential for revenue generation). A selection of generated ideas is then scored against each of the three criteria in a matrix. We discuss different methods of scoring (e.g. rating on a scale) and again let the participants select their own scoring method. This phase helps develop the convergent thinking and risk assessment skills needed by participants (Birkinshaw & Jenkins, 2009; Proctor, 2013).
SELECT	Integrate the best-scored ideas to write a potential creative solution to the prioritised drivers.	Methods of coming to an overall opinion on an idea based on the criteria scores are discussed. These include simply aggregating scores to weighing up the arguments for and against (Proctor, 2013). Participants are asked to use a method suitable for them and choose on that basis the best overall ideas they came up with for implementation in the organisation. It is often the case that different ideas meet different needs so participants are asked to integrate the best ones to provide an overall potential solution.
COMMIT	Develop tailored strategies to persuade different stakeholders to buy-in to delivering the solution.	Effective motivation of self and others has been shown to be an important influence on the success of the innovation process (Amabile, 1983; Amabile & Pratt, 2016; Birdi, 2007; Eisenberger & Shanock, 2003; Howell, 2005; Sternberg & Lubart, 1996). Participants are therefore asked to identify key stakeholders (e.g. senior management, clients/customers, shopfloor staff) for their chosen solution and develop tailored arguments for each stakeholder to persuade them to commit to the innovation. Here we discuss how different theories of motivation (e.g. Vroom's (1964) expectancy-valence theory of motivation or self-determination theory (Ryan & Deci, 2017)) can be used to construct persuasive arguments.

Table 1. Description of how the CLEAR IDEAS innovation model works in practice and the research rationale behind each step (continued).

Step	Key activities	Research rationale
LEAD	Outline key characteristics required by the innovation leader(s) and delivery team and identify who could fit those roles.	Good ideas can disappear if there is not clear leadership and management of the implementation process (Hunter, Cushenbery, & Jayne, 2017; Zhang & Bartol, 2010). We discuss how research has identified characteristics of good leaders of innovation including use of both formal and informal networks to champion ideas, empowerment of subordinates, continual verbal encouragement and access to time and resources (Hennessey & Amabile, 2010; Hirst, Van Dick & van Knippenberg, 2009; Howell & Boies, 2004; Shalley & Gilson, 2004). We also cover findings from the emerging ambidextrous leadership literature which suggests that innovation leaders use open and closing behaviours at different stages of the innovation process (Zacher & Wilden, 2014). Trainees prioritise the characteristics required of a suitable leader (e.g. knowledge, experience, authority) for their innovation and then identify someone who would fit that profile and also who could fulfil other required roles so that the right mix of capabilities are in the innovation team.
ENGAGE	Identify methods for engaging with key innovation users to get their early views on the intended innovation.	A COI Innovation Survey of 513 UK organisations found that the most successful innovations were significantly more likely to have involved more engagement and negotiation with those potentially affected by the innovation (Leach, Totterdell, Birdi, Clegg, Wood & Wall, 2001). Participants are therefore asked to identify whose opinion on the new idea is also worth seeking out, or who the idea can be piloted on and what methods would be suitable for doing this (e.g. a focus group for potential customers). Since this also chimes with the user-centred design perspective which advocates for greater involvement of users throughout the innovation process (Puccio, Cabra, Fox, & Cahen, 2010) we also ask participants how users could be involved in the earlier IDEAS stages too.
ALIGN	Strategically define target users and what partners, resources and systems need to be in place to deliver the innovation to the users.	Here participants are asked to consider how strategies, resources and systems can be integrated in order to implement the new innovation (Becker and Huselid, 1998; Tortoriello & Krackhardt, 2010). A systematic literature review carried out by the author and colleagues of the factors influencing the adoption of new practices in organisations found that issues such as poor employee training, supplier integration and financial investment all contributed to implementation failures of new initiatives (Leseure et al., 2004). Participants are therefore asked to consider which customers/clients/innovation users would be best to focus on, which partners would best fit them and how they can ensure internally they have sufficient skills, time, technology, finance and other resources to ensure effective delivery.
REVIEW	Action plan for implementation.	Lack of measurement, assessment and review during the implementation process has also been highlighted as a factor likely to undermine success (Adams, Bessant & Phelps, 2006; Leseure et al., 2004). Participants therefore in this final stage create an implementation action plan outlining the key activities to be undertaken as a result of the above, who will undertake them and by when.

Table 2. Zero-order correlations between study variables (n =132).

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Tenure	11.58	8.76											
2. Supervisor	1.11	0.32	.01										
3. Gender	1.49	0.50	-.12	.12									
4. Utility reaction	4.48	0.54	-.09	-.01	-.03								
5. Enjoyment reaction	4.61	0.49	-.07	.04	.02	.48***							
6. Difficulty reaction	1.83	0.78	.07	.05	-.13	-.11	-.16						
7. Idea generation competencies (T1)	3.06	0.58	.00	-.17*	-.06	.17	-.04	-.13					
8. Idea generation competencies (T2)	3.99	0.44	-.01	-.12	-.06	.31***	.22*	-.19*	.64***				
9. Idea implementation competencies (T1)	3.19	0.59	.06	-.09	.05	.13	.06	-.16	.63***	.46***			
10. Idea implementation competencies (T2)	3.82	0.48	.14	-.19*	.01	.13	.08	-.11	.47***	.63***	.72***		
11. Technology skill (T1)[a]	4.08	.91	-.34	-.03	.16	.20	-.21	-.30	.40	.34	-.03	.23	
12. Technology skill (T2)[a]	4.42	.95	-.44	-.15	.22	-.19	-.24	-.20	.45	.60**	.06	.53*	.66**

* p<.05 ** p<.01 ***p<.001 [a] n = 18-20

Table 3. Examples of organisational level impacts arising from application of the CLEAR IDEAS innovation model in trainees' workplaces.

Organisation type	Description of impact
City Council	**Organisational efficiency and economic impact in adult social care:** Based on the principles learned whilst attending CI workshops, Sheffield City Council (SCC) managers in the Communities Portfolio used monthly 'Thinking Aloud' sessions to embed regular time for innovative thinking and application of CLEAR IDEAS approaches. The monthly sessions contributed to the development of a new and more efficient Community Access and Reablement Service (CARS) for Sheffield aimed at providing support for older people and those with physical or sensory impairment. The basis for CARS arose from application of CI to the challenge of saving costs by reducing demand for adult social care services. In the twelve months after its implementation, adult referrals requiring formal assessment for social care needs fell from 80% to 31%, due to improved efficiency of the new system. The new system was estimated by management to have saved SCC £1.7m in the first year. The Head of Improvement and Development, Communities Portfolio, stated: *"It is really clear that there is a direct link between the ideas that were generated in the CLEAR IDEAS session and the significant reablement programme that is now in full swing and making a very significant impact on reducing assessment costs and waiting times and diverting people effectively from adult social care.".* Data collected up to three years after SCRLP attendance.
Fire and Rescue	**Development of more cost-effective smoke alarm fitting**: South Yorkshire Fire and Rescue (SYFR) used creative thinking techniques introduced on the CI workshop to improve their smoke alarm fitting by adopting a simple and effective solution (Velcro pads) to solve the problem of dust and alarms falling off ceilings. This solution overcame an organisational health and safety issue surrounding the fixing of alarms to ceilings containing asbestos and reduced the need for trained individuals to re-fit alarms that had been previously poorly fitted. The reduction in materials alone was estimated to save 3p per alarm fitting. Data collected up to two years after SCRLP attendance.
	New resources to improve road safety of young people: SYFR participants realised by using the CI techniques in a workshop that the efficiency of road safety communication to schoolchildren could be improved by pooling cross-agency resources. The resulting initial 'One Message' project was piloted in Sheffield primary schools and indicated the viability of the approach. This then led to them being given a budget of £98k from South Yorkshire Safer Roads Partnership to commission a new integrated road safety education package. The education package centred on an interactive and hard-hitting video presentation entitled 'Collision' and SYFR was working with local schools to ensure as many young people in the county as possible had a chance to see the film, with the aim of improving road safety in the future. Data collected up to two years after SCRLP attendance.

Table 3. Examples of organisational level impacts arising from application of the CLEAR IDEAS innovation model in trainees' workplaces (continued).

Organisation type	Description of impact
Police	**Influence on planning and management of services and on continuous improvement training in the police service**: Following positive experiences from their SCRLP participants, South Yorkshire Police (SYP) wrote into their continuous improvement strategy document that the CLEAR IDEAS model had been adopted as a supporting toolkit. This led to a further 100+ police officers, staff and service improvement groups being trained in the use of the CI methodology so this could be used throughout the organisation. Examples of impact cited by those participants included development of a more practical strategy for briefing officers about dealing with domestic violence, more efficient ticketing systems and changes to the drugs disposal policy. Data collected up to two years after SCRLP attendance.
NHS Hospital Trust	**Improved health care practice**: A Medicine Information Pharmacist in Sheffield Children's NHS Foundation Trust was noticing problems with poor patient compliance and drug administration with a gastro-oesophageal reflux medication. Using the CI workshop techniques he was able to influence the choice and adoption of a different drug, reportedly leading to more accurate administration, dosage and patient compliance. As he said *"… by and large it is has been a success… the implementation of the change went a lot better than I thought with over 90% of patients changed over to the new medicine within 2 months… There was a predicted financial saving for the Trust (c. £10k per annum).. and these savings seemed to have been realised despite a 15% increase in prescribing of the new medicine. Other hospitals around the country asked for a copy of our guidelines with a view to implementing the same innovation…"*. Data collected up to two years after SCRLP attendance.
Forestry Organisation	**Changed strategic approach to environmental planning**: South Yorkshire Forest (SYF) is responsible for managing over 200 square miles of rural and urban landscapes and a million people live within its boundary. It was tasked with developing a Local Nature Partnership (LNP) to bring about improvements in the local natural environment. The SYF Director used the CI approach in a series of meetings with partners in order to expand membership to include the private sector and therefore provide a more widely inclusive and effective partnership than originally envisioned. He said *"The CLEAR IDEAS model gave us a framework to look carefully at strategic development and business development opportunities, and not just to think in terms of usual projects. The Commit, Lead and Engage aspects were extremely valuable tools in helping to identify the economic benefits of our (collective) work and to develop productive new partnerships, particularly with the private sector. This has proved invaluable because the firmer focus on jobs and growth has placed a much clearer emphasis on working with business sector partners. The LNP is quite a long strategic development process…but has already delivered more efficient working through service integration."*. Data collected up to two years after SCRLP attendance.

Table 4. Summary of factors found to facilitate (+) or inhibit (-) impact of the CLEAR IDEAS innovation training intervention.

Training characteristics
- Integrated model covering both ideas generation and implementation used as an heuristic framework +
- Basis on research evidence aids credibility +
- Accessible language +
- Range of different analytic, creative and strategic thinking techniques offered +
- Behaviour modelling approach used for training +
- Opportunity to practice on the course +
- Collaborative learning groups +
- Goal-setting of assignment for post-training period +
- Tools to help transfer e.g. the electronic workbook document +
- Addition of follow-up advice and support by trainer if needed +
- Random allocation of trainees to teams during training -
- Lack of follow-up workshops -

Trainee characteristics
- Motivation to transfer +
- Autonomy/authority to make decisions, leadership +
- Allocation of time to work on the application +
- Willingness to share with colleagues +
- Belongingness as team +
- Change in job role –

Task characteristics
- Real-life challenge addressed during training +
- Strategically important tasks taken on +
- Alignment / integration with existing processes or projects +
- Clear ownership / accountability of challenge with trainees +
- Application attempted within one organisation +
- Application project remit too wide -
- Application project objectives too vague -

Work environment
- Senior management buy-in to project application +
- Creation of network of colleagues who have undertaken the same training +
- Financial support provided for project application +
- Engagement with key stakeholders +
- Organisational turbulence -

Figure 1. A visual representation of the CLEAR IDEAS model of innovation development.