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## THE EFFECTIVENESS OF IDEA CAPTURE SCHEMES

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13 Innovation at work is mainly driven by employees' ideas. This paper reports a study of  
 the effectiveness (e.g., rate of suggestion making) of schemes for capturing these ideas.  
 15 Based on a survey of 182 UK organizations, the study shows that decentralized suggestion  
 schemes and work-based systems are more effective than centralized and informal schemes.  
 17 The extent of planning, publicity, feedback and management support given to the scheme,  
 and the type of rewards offered to employees, also independently account for variation in  
 19 effectiveness. Publicity and non-monetary rewards, though, are found to be most decisive,  
 regardless of scheme type. Learning culture also affects the rate of suggestion making,  
 21 though the effect is greater for centralized and decentralized schemes than for the others.  
 The key implication of the findings is that by paying particular attention to how they are  
 23 advertised and how participation is rewarded, organizations could improve the return on  
 their idea capture schemes.

25 *Keywords:* Idea capture schemes; suggestion schemes; quality circles; effectiveness.

### Introduction

27 In recent years, the publicity given to the importance of innovation to organizational  
 success has rejuvenated an interest in Idea Capture Schemes. Suggestion schemes,  
 29 quality circles and other such schemes are, in the terminology of van Dijk and  
 van den Ende (2002, p. 389), methods for “extracting” and “landing” employees'  
 31 ideas. Extracting concerns the generation and sharing of employees' ideas, while  
 the landing process refers to the capture and evaluation of those ideas (“set down”  
 33 in van Dijk and van den Ende terms). The key assumption behind the use of idea  
 capture schemes is that there is a reservoir of ideas in organizations that may remain

2 *D. J. Leach, C. B. Stride & S. J. Wood*

1 dormant in the absence of such schemes, and that drawing them out will enable the organization to harness the otherwise latent talents of their employees.

3 If acted on, these ideas should be manifest in their effects on overall levels of  
4 innovation and in turn key indicators of organizational performance, such as costs,  
5 productivity and profits. There is some, albeit limited, evidence to support this.  
6 A survey of 513 UK organizations found that those with more successful major  
7 innovations also reported higher levels of idea capturing from non-management  
8 employees (Leach *et al.*, 2001). Furthermore, a survey of suggestion schemes (IRS  
9 Employment Review, 1996), involving 40 UK organizations, revealed that yearly  
10 savings from employees' ideas ranged from £10,000 to £1.9m (average £63,000).  
11 Consistent with this, a more recent survey of 62 UK organizations revealed signifi-  
12 cant savings, amounting to some £153m in one year (ideas UK, 2001). In a similar  
13 vein, Frese *et al.* (1999) estimated that the savings (for 1996) from a suggestion  
14 scheme in a Dutch steel company were approximately 1.5m guilders (\$750,000).  
15 de Menezes and Wood's (2006) analysis of Britain's Workplace Employee Rela-  
16 tions Survey of 1998 has also shown that idea capture schemes, like quality circles,  
17 are now an integral part of a high involvement management that can successfully  
18 combine quality and productivity.

19 Surveys of managerial practice (Cully *et al.*, 2000; Osterman, 1994, 2000), how-  
20 ever, have shown that idea capture schemes are far from ubiquitous, and that where  
21 they exist employee participation may not be that high (IRS Employment Review,  
22 1996). This low participation may well underpin the oft-heard view amongst man-  
23 agers that employees do not appreciate idea capture schemes and any effect that  
24 they may have is short-lived. This in turn partly explains the low use of schemes  
25 (Klotz, 1988, pp. 347–348).

26 Social scientists have to a large extent mirrored this lack of appetite for idea  
27 capturing, as it is a neglected topic of research. In particular, there has as yet been  
28 no attempt to investigate the effectiveness of schemes to find out whether certain  
29 types of schemes are more likely to lead to suggestion making and to result in  
30 ideas that are implemented. Nor has there been any reported systematic attempt  
31 to compare the contribution of different design features to scheme effectiveness,  
32 such as the frequency of feedback given to employees on suggestions or the extent  
33 of publicity given to the scheme. Ekvall's (1976) study of engineering in Sweden,  
34 though, suggested that having unbiased methods of evaluation, a specialist per-  
35 son responsible for the suggestion scheme, and reasonable rewards for suggestions  
36 does stimulate suggestion making. The few studies that have examined the effects  
37 of schemes are narrow in scope, as they have either concentrated on one method  
38 of idea capturing (Ekvall, 1976; Hill, 1991; Rapp and Eklund, 2002) or not distin-  
39 guished between types of idea capture schemes (Leach *et al.*, 2001). Other studies  
40 have either assessed idea capture schemes as part of a gainsharing (Scanlon-plan)

1 package (Arthur and Aiman-Smith, 2001; Schuster, 1984) or incorporated them into  
2 a “bundle” of managerial practices (MacDuffie, 1995; Wood and Albanese, 1995;  
3 Wood and de Menezes, 1998), without any examination of their individual effects.  
4 There has also been insufficient attention to the role of employee development and  
5 training specifically for innovation, or what is often referred to as a learning culture,  
6 in enhancing the effects of idea capture schemes.

7 In this paper, we assess the effectiveness of different types of schemes, focusing  
8 on the number of ideas generated and implemented. The main aims of the study are  
9 to examine:

- 10 1. whether idea capture schemes vary in terms of effectiveness (e.g., the extent to  
11 which formal methods of idea capturing are more effective than informal ones);
- 12 2. whether design features enhance effectiveness;
- 13 3. whether scheme types and design features are independently related to effective-  
14 ness; and
- 15 4. whether the impact of scheme types and the design features on scheme effec-  
16 tiveness varies with the extent to which the organization has a learning culture.

## 17 **Conceptual Background and Hypotheses**

18 Drawing upon the notions of Frese *et al.* (1999), Smith (1989) and others, idea  
19 capture schemes can be classified into four types: centralized suggestion schemes,  
20 namely a single scheme for all employees; decentralized suggestion schemes, that  
21 is several independently run schemes within an organization; work-based systems  
22 such as quality circles and product development teams and informal schemes. An  
23 informal scheme, as we define it, is when there is no established method for capturing  
24 ideas, but there is nonetheless a structured procedure for evaluating ideas. Employ-  
25 ees thus discuss their ideas with a relevant individual (e.g., supervisor, manager)  
26 who then processes them through a formal procedure. Having an informal scheme  
27 thus differs from the situation where the generation and evaluation of ideas is simply  
28 left to normal line management processes, which we would treat as being where no  
29 scheme exists.

30 The four types of schemes differ on a number of dimensions. First, the level of  
31 formality varies across schemes. Suggestion schemes and work systems involve for-  
32 mal methods to collect employees’ ideas, whereas informal methods do not. Second,  
33 some schemes involve group work. The prime example of these is the quality circle,  
34 in which small groups of employees (typically between 8 and 12, Rosen, 1989,  
35 p. 183) work together on a given project. In contrast, the emphasis with regard to  
36 suggestion schemes is on individuals generating and recording ideas independently.  
37 Third, schemes can be differentiated in terms of focus. The suggestion scheme is

4 D. J. Leach, C. B. Stride & S. J. Wood

1 general in scope as employees can typically submit ideas on any issue or aspect of  
2 the organization and at any time. Quality circles and product development teams,  
3 on the other hand, are likely to be focused on specific topics. The remit of quality  
4 circles is typically “to diagnose ‘quality’ problems and propose solutions” (Rosen,  
5 1989, p. 183), though they need not be restricted within these parameters.

6 We might expect then the breadth of ideas to be greatest when suggestion schemes  
7 are used. But, as Klotz (1988) argues, work-based systems and quality circles might  
8 receive the most ideas as “the know-how and experience of the various employees  
9 are pooled” (p. 347). We might also argue that they will produce ideas of better  
10 quality, and hence more ideas implemented, due to the rejection of ideas with little  
11 or no potential. More fundamentally, however, there is an expectation when quality  
12 circles and development teams are formed that the group will produce ideas. We,  
13 therefore, test the following hypothesis:

14 **Hypothesis 1.** *The four types of idea capture schemes will have a differential*  
15 *impact on effectiveness, with work-based systems (e.g., quality circles, development*  
16 *teams) being more effective than the other types of idea capture schemes.*

17 From the literature on idea capturing (Holmes, 1952; Klotz, 1988; Smith, 1989; van  
18 Dijk and van den Ende, 2002), we have identified a number of dimensions or, what  
19 we will call, design features on which schemes may be characterized: planning and  
20 employee participation in scheme development; publicity and particularly how fre-  
21 quently this is updated; management support; feedback to employees on their ideas;  
22 and rewards, specifically the extent, type and mix of reward offered in exchange for  
23 ideas (e.g., monetary or recognition or both). We hypothesize that all five design  
24 features will be positively associated with the effectiveness of idea capture schemes,  
25 and will now discuss each of these in more depth.

### Planning

26 Consistent with the introduction of new work practices or equipment, managing  
27 scheme implementation is a critical process (Holmes, 1952; Smith, 1989). We  
28 hypothesize that planning that involves the participation of both internal and exter-  
29 nal agents will have positive effects on scheme effectiveness. Internal discussion  
30 that involves employees, or their representatives, who will be affected by the scheme  
31 should have a number of benefits. It should help to ensure that the reasons under-  
32 pinning scheme implementation are recognized and accepted, to provide an oppor-  
33 tunity for employees to comment on the design of the scheme, thereby enhancing  
34 employee ownership of it, and to clarify what will be expected of employees once  
35 the scheme is implemented. In doing so, it is quite likely that schemes are perceived  
36 to be procedurally fair, and that idea capturing is seen as a “fair process” (Kim and  
37

1 Mauborgne, 2003, p. 6). External discussion arising, for example, from managers  
2 being members of professional bodies or visiting other organizations is also impor-  
3 tant as it enables management to learn about good practice in both the design and  
4 maintenance of schemes.

### 5 **Publicity**

6 Publicity for the scheme is most likely to contribute to effectiveness in several  
7 inter-related ways. The minimum that publicity should do is to create an awareness  
8 of the scheme. Publicity can serve as both a conduit for reaffirming management  
9 commitment to creativity, suggestion making and innovation and a type of feedback  
10 as it informs individuals of successfully implemented ideas and awards (van Dijk  
11 and van den Ende, 2002). We envisage that publicity will help to create a climate  
12 in which making suggestions is perceived to be welcomed and valued.

### 13 **Managerial support**

14 Overt management support is widely viewed as an essential requirement to promote  
15 employee creativity, suggestion making and idea implementation (see e.g., Ama-  
16 bile *et al.*, 1996; Axtell *et al.*, 2000; Frese *et al.*, 1999; Smith, 1989; van Dijk and  
17 van den Ende, 2002). More specifically, as Smith (1989) observed, “Strong man-  
18 agement support is essential for the healthy growth of a suggestion scheme. Lack  
19 of interest by top management filters down through all branches of the organization  
20 and is eventually reflected in a dwindling participation rate and a lowering of the  
21 quality of suggestions submitted by employees” (p. 101). In addition, a survey of  
22 57 organizations found that management support is an important determinant of  
23 scheme success (White and Jacobs, 1961).

### **Feedback**

24 The role of feedback in enabling individuals and teams to perform effectively has  
25 been widely recognized and promoted (Cherns, 1987; Hackman and Oldham, 1976;  
26 Ilgen *et al.*, 1979; Kluger and DeNisi, 1996; Trist and Bamforth, 1951). The findings  
27 of Zhou’s (1998) laboratory experiment showed that the most creative ideas were the  
28 product of an interaction between positive feedback, an informative style of feedback  
29 and high task autonomy. In an applied setting involving operators of advanced  
30 manufacturing technology, the findings of a change study showed that feedback can  
31 increase operators’ self-reliance and lead to substantial performance benefits (Leach  
32 *et al.*, 2001). With regard to idea capture schemes, providing feedback to employees  
33 on their ideas should demonstrate that the scheme is well run, thus facilitating  
34 sustained participation. We therefore propose that feedback will positively affect  
35 scheme effectiveness.

6 *D. J. Leach, C. B. Stride & S. J. Wood*

1 **Rewards**

3 The use of rewards has the potential to encourage creative behavior and to increase  
5 individuals' willingness to share his/her ideas. Research suggests that employees  
7 are more likely to submit ideas on a regular basis if they are intrinsically motivated  
9 to do so (Amabile, 1983), but extrinsic rewards are often also seen as an impor-  
11 tant stimulant to suggestion-making (Frese *et al.*, 1999). Indeed, van Dijk and van  
13 den Ende (2002) propose that both non-financial and financial rewards should be  
15 used, such as a combination of recognition and monetary awards. They are, though,  
17 cautious about a disproportional use of financial rewards as this "runs the risk that  
19 employees will not communicate ideas that they believe to have an insignificant  
21 impact on the operational costs" (pp. 390–391), as they recommend, "rewards need  
23 to be used in such a manner that intrinsic motivation is not undermined by too  
25 strong an emphasis on extrinsic motivators" (p. 391). Based on this argument, and  
27 our judgement that the size of financial rewards typically are relatively modest, we  
hypothesize that the use of both non-financial and financial rewards will be more  
strongly related to scheme effectiveness than when one or other type is used alone.

As discussed, we expect that each design feature will have a strong, positive  
and independent effect on scheme effectiveness. We therefore test the following  
hypothesis.

**Hypothesis 2.** *The positive effects of the different design features on scheme  
effectiveness will be independent of each other.*

In presenting our hypotheses, we have assumed that types of schemes and design  
features independently predict effectiveness. Design features are taken to be general  
and thus we would expect any scheme that included all five features to perform well,  
regardless of its type. Equally, though, we would expect the differential effects of  
scheme types on effectiveness to hold regardless of design features; that is, these do  
not subsume the effect of scheme types. We therefore test the following hypothesis:

**Hypothesis 3.** *Scheme type and design features will independently predict  
effectiveness.*

We might, however, expect certain design features (i.e., planning and publicity) to  
enhance the effects of the others. Planning differs from the other four features since  
it is concerned with the processes by which the schemes are designed. It involves  
the selection of the other design features, specifically the determination of initial  
levels of publicity, feedback and rewards, although these may change over time.  
We expect that the effects of the other design features on scheme effectiveness will  
vary with the extent and the thoroughness of management's planning, being most  
beneficial when levels of planning are high, but weaker when levels are low. Hence

1 we test whether planning moderates the effects of the other features:

3 **Hypothesis 4.** *Design features and planning will interact positively to predict scheme effectiveness.*

5 Publicity is also a distinctive design feature as it will determine employees' awareness of the scheme, which is the minimum necessary for them to participate, and will also typically contain exhortations to employees to participate in the scheme.  
7 Given this, we propose that low publicity will mean that regardless of the level of the other elements of the design, their effect will be minimal. Only when publicity  
9 is high will they be beneficial. We therefore test:

11 **Hypothesis 5.** *Design features and publicity will interact positively to predict scheme effectiveness.*

13 Our inquiry thus far has considered scheme effectiveness without reference to the organizational context. We would, however, particularly expect a learning culture to have a significant impact on the effectiveness of schemes and perhaps also to  
15 enhance the effects of certain design features. Analogous to the term organizational culture (Huczynski and Buchanan, 2001, p. 884), we define a learning culture as  
17 the values, beliefs and practices that shape employees' attitudes towards learning at work. A learning culture should encourage employee creativity and promote a  
19 willingness to share ideas in its own right (cf. van Dijk and van den Ende, 2002, p. 389), but we are particularly interested in whether it enhances the effectiveness  
21 of certain types or even all types of schemes. We would particularly expect the effectiveness of work-based schemes to be enhanced, due to their team-based or  
23 collaborative nature, if they are embedded in a learning culture. We therefore test the following hypothesis:

25 **Hypothesis 6.** *Type of scheme and learning culture will interact to predict effectiveness, showing a strong, positive effect for work-based systems.*

27 We might also expect learning culture to enhance the value of the design features, with the exception of planning. For example, employees are most likely to respond  
29 to publicity when learning culture is high, but may well be unresponsive when it does not exist. Likewise, recognition for ideas is quite likely to be more positively  
31 viewed and hence effective when learning is encouraged and valued than when it is not. The final hypothesis that we test is therefore:

33 **Hypothesis 7.** *Design features and learning culture will interact to predict effectiveness.*

1

## Method

### Participants

3 A sample of UK organizations ( $N = 182$ ) took part in the study. The number of  
employees in the organizations ranged from 3 to 320,000 (mean = 8147, median =  
5 945), and 74% of organizations had more than one site. The smallest organization  
had a turnover of £50,000, whereas the largest had a turnover of £5.5 billion.

7 Two methods were used to acquire the sample. First, 190 members of ideas  
UK were contacted, with just under half (88) responding. A key objective of ideas  
9 UK is to provide advice and guidance on the development of suggestion schemes.  
Accordingly, 92% of this sub-sample reported that their principal means of idea  
11 capture was either a centralized or decentralized suggestion scheme. Second, we  
contacted organizations on an ad-hoc basis ( $N = 94$ ). Although centralized schemes  
13 were used by 29% of this sub-sample, 53% reported that informal schemes were  
the main methods to harness employees' ideas.

15 In terms of experience of running idea capture schemes, 65% of respondents  
reported that the scheme in current use was their organization's first. The age of  
17 schemes ranged from 1 month to 50 years (mean = 7.5 years, median = 5 years),  
and some 79% of respondents reported that their schemes had been in operation for  
19 at least two years.

### Procedure

21 The study was conducted over a six-month period (2000–2001). Individuals who  
were responsible for managing their organization's idea capture scheme (scheme  
23 managers) were contacted by phone. The names of these individuals were either  
known in advance or were obtained via contact with a manager in the organization,  
25 who was typically a personnel or human resource manager. The purpose of the phone  
contact was to seek participation in the study and to discuss any queries with regard  
27 to involvement and confidentiality. Having agreed to participate, scheme managers  
were sent questionnaire packs which included a cover letter, questionnaire and pre-  
29 paid envelope. Prior to survey administration the questionnaire was piloted, to check  
item relevance and clarity.

### Measures

31 Questionnaire items for the measurement of effectiveness and the design features  
33 (planning, publicity, managerial support, feedback and rewards) were constructed  
specifically for this study. Only the measure of learning culture was not. Three  
35 indicators of effectiveness were used. In addition to the core indices on suggestion  
making and idea implementation, an overall measure of scheme success was used.

1 *Scheme success*

3 Three items were used to assess the extent to which a scheme had met its goals,  
5 had had an impact on the organization, and whether or not the impact was expected  
7 to last (items: “Has your scheme met its primary goals?” “Has your scheme had  
9 an impact on your organization?” and “Do you expect the impact of the scheme to  
last?”). A five-point response scale was used from “not at all” to “a great deal”. The  
internal consistency reliability of the items was high (Cronbach’s alpha = 0.90),  
hence the mean score was used as a measure of the perceived success of the scheme,  
with a range of possible values from 1 to 5 (mean = 3.04, SD = 1.02). The amount  
of missing data on this variable was small (10%).

11 *Rate of suggestion making*

13 The scheme manager was asked to state the number of ideas that his or her orga-  
15 nization’s scheme had generated (mean = 697, median = 110). A suggestion rate  
17 was calculated by dividing this by the number of employees covered by the scheme  
(mean = 6831, median = 800). The mean and median suggestion rates (number of  
suggestions per employee covered) were 1.27 and 0.13, respectively. Non-response  
on the number of ideas suggested was high (25%).

*Rate of idea implementation*

19 The number of ideas implemented (mean = 132, median = 13) was solicited from  
21 the scheme manager, which we assessed relative to the number of ideas generated.  
The mean and median implementation rates were 0.13 and 0.02, respectively. As  
with ideas generated, non-response was high (45%).

23 *Management support*

25 A single item was used to assess support from management, namely “Do man-  
27 agement provide support to all employees as part of the idea capture scheme?”  
Responses were recorded on a five-point response scale from “not at all” to “a great  
29 deal”. The response scale was dichotomized, with “quite a lot” or “a great deal” of  
31 support recoded as 1, and “a moderate amount”, “just a little” or “not at all” recoded  
as 0. This was done to simplify item interpretation, and to minimize the degrees of  
33 freedom used by this item in analyses. Normally, though, such five-category ordinal  
35 response variables would be coded into four dummy variables (Cohen *et al.*, 2003),  
but given the reduced sample available when predicting two of the three effec-  
tiveness variables, and the very small numbers in the extreme (“not at all” and “a  
great deal”) categories, creation of a dichotomous variable was the most appropriate  
solution. The distribution of each effectiveness variable over the original five-point

10 *D. J. Leach, C. B. Stride & S. J. Wood*

1 response scales was examined prior to dichotomization to check that any significant relationships with effectiveness were not being masked.

### 3 *Planning*

5 Two items were used to examine the extent of scheme-related planning. The first focused on the amount of internal planning, the specific question being “How much negotiation and discussion was undertaken within your organization in order to implement the system?” The second item assessed the degree of external planning, asking “How much negotiation and discussion was undertaken with an external organization in order to implement the system?” The extent of the second was far lower than, and rarely independent of, that of the first: in all but six companies external planning only took place “quite a lot” or “a great deal” if internal planning also occurred at this level. The questionnaire items recorded responses on a five-point scale from “none at all” to “a great deal”. A single dichotomous variable was created for use in our analysis, which took the value of 1 if the levels of both internal and external planning were rated as “quite a lot” or “a great deal”, and 0 if not. Again the distribution of each effectiveness variable over the original five-point response scales was examined prior to dichotomization to check that any significant relationships with effectiveness were not lost.

### 19 *Publicity*

21 The questionnaire included two items to assess publicity. The first was dichotomous, asking whether any publicity was produced for the scheme, and worded as “How, if at all, is the system publicized?” Scheme managers who had ticked “Yes” were then asked to indicate how often the publicity material was updated (“How frequently is the publicity updated?”); they could select one of the following options: 23 daily, weekly, monthly, quarterly, yearly and never. These two measures were then combined, with “no publicity” forming an additional category in the measure of 25 updating. This ordinal variable, after examining its relationship with each effectiveness variable to ensure that no significant relationships were being lost, was 27 dichotomized for analytic purposes. The final measure took the value of 1 if publicity was frequent (i.e., updated daily, weekly or monthly) and 0 if it was updated 29 less frequently (i.e., quarterly or yearly), never updated or non-existent. 31

### *Feedback*

33 Since feedback on ideas can originate from a variety of sources, scheme managers were asked to indicate how much each of a number of sources provided feedback on 35 ideas (“Do each of the following provide feedback on ideas?”): senior management,

1 other management, non-management employees, and designated teams (e.g., teams  
2 comprising both management and non-management employees). A fifth item, feed-  
3 back given by “others”, was also included to capture any other source of feedback.  
4 A five-point response scale — “not at all” to “a great deal” — was used. We first  
5 tested to see if feedback from a single source would most affect scheme effective-  
6 ness or whether feedback from multiple sources had additional benefits. The results  
7 revealed that obtaining feedback from two or more sources had no additional pos-  
8 itive effect on scheme effectiveness over that from a single source, nor did it have  
9 negative effects (e.g., through creating mixed messages). Hence a single variable  
10 measuring the receipt of any feedback regardless of source was appropriate. For  
11 parsimony and simplicity of interpretation this was constructed as a dichotomous  
12 variable taking the value of 1 if the level of feedback from at least one of the five  
13 listed sources was rated as “quite a lot” or “a great deal”, and 0 if not. Again, prior  
14 to calculation, the distributions of each effectiveness variable over the five-point  
15 response scales of the original feedback items were examined to check that no  
16 significant information was being lost.

### 17 *Rewards*

18 Scheme managers were asked to indicate the extent to which three kinds of rewards  
19 were awarded for ideas: “recognition (e.g., praise), monetary (cash), and non-  
20 monetary (e.g., vouchers, days out)”. A five-point response scale was used running  
21 from “not at all” to “a great deal”. Each of these variables was dichotomized, taking  
22 a value of 1 if the level of use was rated as “quite a lot” or “a great deal”, and 0  
23 if not. The distribution of each effectiveness variable over the original five-point  
24 response scale was again examined prior to dichotomization to check that no sig-  
25 nificant effects were hidden. We then used the three dichotomous variables to both  
26 test the hypotheses that the use of rewards has beneficial outcomes and examine the  
27 relationship between a mix of different types of rewards and effectiveness. A single  
28 variable to test the overall use of rewards was not created, since the use of the three  
29 different types was found to be largely independent of each other.

### *Learning culture*

30 A six-item scale, based on Shipton *et al.* (2002), was used to assess employee  
31 learning and development. The questions concern the extent to which organizations  
32 have a formally recognized procedure for employee career development; support  
33 learning that is not work-related (e.g., basic skills, hobbies); support learning that is  
34 work-related but not part of the individual’s current job (e.g., learning about other  
35 parts of the company); a formally recognized mentoring/coaching system; a range  
36 of development opportunities for all employees (rather than only training people  
37

12 *D. J. Leach, C. B. Stride & S. J. Wood*

1 occasionally to meet specific job needs); and policies, strategies or vision statements  
2 that in any way refer to the importance of learning or employee development. A  
3 five-point response scale, ranging from “not at all” to “a great deal”, was used.  
4 Within our sample the internal consistency reliability (Cronbach’s alpha) was 0.85.

### 5 **Statistical analyses**

6 Different statistical models were required for each of the three measures of effec-  
7 tiveness. Perceived success, given that this was normally distributed, was predicted  
8 using standard multiple regression techniques. For suggestion and implementa-  
9 tion counts a generalized linear modeling approach was required. While taking the  
10 natural logarithm of these highly positively skewed measures transformed both to  
11 approximate normal distributions, the responses of interest were the rates as opposed  
12 to the raw counts. Hence it was necessary to include a fixed (i.e., coefficient set =  
13 1, not estimated) offset term. In this case the logarithm of the number of employees  
14 covered by the scheme was included in the linear predictor.

15 Company size (the number of employees in 2000) and age of scheme were  
16 controlled for before assessing the effects of interest. In both cases the logarithm of  
17 the raw value was used given the positively skewed distribution of the raw values.  
18 When examining the importance of each design feature (to test the unique effects  
19 as in Hypothesis 2) we also controlled for type of scheme. Finally, membership  
20 of ideasUK was taken into account. Analyses were conducted with and without a  
21 dummy variable that represented membership of this organization. As the pattern of  
22 findings was equivalent, we present the analyses that did not control for membership  
23 of ideasUK.

## **Results**

### 25 **Background**

26 Using our four-fold classification, the sample contained 98 centralized schemes,  
27 16 decentralized schemes, 13 work systems schemes and 50 informal schemes  
28 (scheme managers gave these as their organization’s principal form of idea collec-  
29 tion). Table 1 reports the frequencies of the design features. Feedback was the most  
30 prevalent within our sample, with 61.1% of cases reporting a high level. At the  
31 other end of the scale, just 12.7% of respondents reported applying a high degree  
32 of planning to their schemes. With regard to rewards, the most frequently used is  
33 recognition as 41.3% of the sample report high use. Monetary and non-monetary  
34 rewards are highly used by 31.6% and 25.5% of companies, respectively. Just 6.3%  
35 of respondents reported high use of all three reward types. The correlations between  
the design features were almost all positive, but were of weak to medium size,

Table 1. Frequencies of, and correlations<sup>a</sup> between, the design features.

Design features	Cases reporting high level (%)	1	2	3	4	5	6	7
1. Planning	12.7	1.000						
2. Publicity	24.7	0.314	1.000					
3. Support	25.4	0.209	0.193	1.000				
4. Feedback	61.1	0.242	0.268	0.358	1.000			
5. Rewards — recognition	41.3	0.045	0.076	0.245	0.280	1.000		
6. Rewards — monetary	31.6	0.052	0.118	0.209	0.195	-0.009	1.000	
7. Rewards — non- monetary	25.5	0.169	0.323	0.119	0.278	0.208	0.315	1.000

<sup>a</sup>Pairwise correlations measured by Kendall's Tau-B statistic,  $136 \leq N \leq 174$ .

1 ranging from  $-0.009$  between monetary and recognition forms of reward, to  $0.36$   
2 between feedback and support (see Table 1).

3 Table 2 reports the variation in design features by scheme type. Informal schemes  
4 were significantly less likely to involve high levels of publicity and the public-  
5 ity level for decentralized schemes is below that of the centralized schemes and  
6 work systems. Similarly, the use of high levels of monetary or non-monetary  
7 rewards is significantly less common when work-based systems and informal meth-  
8 ods are used. But none of the other design features — planning, support, feed-  
9 back, or recognition — vary significantly between schemes. Formal schemes, for  
10 instance, do not incorporate planning or feedback to a greater degree than informal  
11 ones.

### Hypothesis 1: Scheme type and effectiveness

13 We first tested whether scheme types were differentially related to the three measures  
14 of effectiveness — perceived success, suggestion rate and the implementation rate —  
15 and specifically whether work-based systems are more effective than the other types  
16 of scheme. The results show that the perceived success scores differ to some extent  
17 ( $F = 2.23$ ,  $p < 0.10$ ) across the four types of schemes (though not significant  
18 at the  $p < 0.05$  level, the effect of scheme type accounts for 5% of the variance  
19 in perceived success). The estimated marginal mean for each scheme type is given  
20 in Table 3 (row 1): work systems do best, followed by centralized and informal  
21 schemes. Suggestion rate varies significantly by scheme type ( $F = 3.67$ ,  $p < 0.05$ )

Table 2. Relationships between design features and scheme type.

Design features	Percentage of cases reporting a high level of respective design characteristic for each scheme type								$\chi^2$ Statistic <sup>a</sup>
	Centralized		Decentralized		Work systems		Informal		
	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	
Planning	18.5	92	0.0	15	15.4	13	0.0	36	10.61
Publicity	36.7	98	12.5	16	38.5	13	0.0	43	23.92*
Support	28.4	95	18.8	16	38.5	13	17.8	45	3.38
Feedback	66.0	94	56.3	16	61.5	13	52.3	44	2.53
Rewards — recognition	39.8	93	38.5	13	46.2	13	43.9	41	0.37
Rewards — monetary	51.6	91	35.7	14	0.0	13	7.3	41	32.06*
Rewards — non-monetary	36.5	85	43.8	16	8.3	12	0.0	40	23.74*

<sup>a</sup>Test of the null hypothesis that design characteristics and scheme type are independent. A significant Pearson  $\chi^2$ -square statistic indicates that we should reject this.

\*Significant at  $p < 0.05$  level having corrected for multiple hypothesis testing.

1 with both decentralized and work systems schemes doing better than centralized  
 2 and informal schemes. Implementation rate, however, is very similar for all the  
 3 scheme types. Estimated marginal suggestion and implementation rates for each  
 4 group are given in Table 3 (rows 3 and 5, respectively). Thus Hypothesis 1 is  
 5 partially supported for two out of three outcome measures, the perceived success  
 6 result confirming our hypothesis, while work-based systems outperform all but  
 7 decentralized schemes judged by the rate of suggestions.

### Hypotheses 2: Design features and effectiveness

9 We first determine the separate effect of each design feature on effectiveness in  
 10 turn (controlling for background factors and scheme type). An examination of these  
 11 direct effects enables a comparison with the unique effects of each design feature,  
 12 allowing an understanding of the extent to which features are contributing in similar  
 13 or distinct ways to scheme effectiveness. The estimated marginal means/rates for  
 14 the high and low groups for each design feature under each measure of effectiveness  
 15 are given in Table 4 (columns 4 and 5).

Table 3. Effects of scheme type on effectiveness.

Measure of effectiveness	Other variables in the model	Relationship with ICS <sup>a</sup> type	Estimated marginal means of effectiveness for each scheme type			
			Cent	Decent	WS	Inf
Perceived success	Controls <sup>b</sup> only	$N = 146,$ $F = 2.23$	3.10	2.92	3.76	2.94
	Controls and design features <sup>c</sup>	$N = 111,$ $F = 4.39^*$	3.60	3.46	4.39	3.64
Suggestion rate	Controls only	$N = 125$ $F = 3.67^*$	0.11	0.41	0.29	0.16
	Controls and design features	$N = 97,$ $F = 5.93^*$	0.16	0.81	0.53	0.57
Implementation Rate	Controls only	$N = 92,$ $F = 0.14$	0.20	0.22	0.16	0.22
	Controls and design features	$N = 75,$ $F = 2.29$	0.17	0.37	0.23	0.26

\*Statistically significant at  $p < 0.05$  level (two-tailed test).

<sup>a</sup>ICS = idea capture scheme.

<sup>b</sup>Control variables used are log age of scheme, log total company employees in 2000; relevant to Hypothesis 1.

<sup>c</sup>Relevant to Hypothesis 3.

### 1 *Planning*

3 Planning has a significant positive effect on two of the three measures of effective-  
5 ness. Those companies with a high extent of planning reported on average a higher  
level of perceived success ( $F = 17.56, p < 0.05$ ), and a higher suggestion rate  
( $F = 8.51, p < 0.05$ ), than those with a low extent of planning. Planning, though,  
is unrelated to the rate of implementation.

### 7 *Publicity*

9 Companies with frequently updated publicity (i.e., daily, weekly or monthly)  
recorded significantly higher levels of perceived success ( $F = 31.24, p < 0.05$ )  
11 than those with less frequently updated (i.e., quarterly, yearly, never) or no public-  
ity material. The number of ideas suggested is also significantly positively related  
( $F = 21.52, p < 0.05$ ) to the extent of publicizing the scheme.

16 *D. J. Leach, C. B. Stride & S. J. Wood*

1 *Management support*

3 Management support for the scheme is strongly related to all three effectiveness measures. Those companies that offered a high level of support had a significantly higher mean success score ( $F = 28.64$ ,  $p < 0.05$ ), and higher rates for suggestion

Table 4. The relationships between design features and effectiveness measures.

Design feature	Measure of effectiveness	Direct effects <sup>a</sup> of design features and estimated (low/high) marginal means/rates			Unique effects <sup>b</sup> of design features
		Effect	Low	High	
Planning	Perceived success	$N = 135$ , $F = 17.56^*$	3.07	4.10	$N = 111$ , $F = 5.19^*$
	Suggestion rate	$N = 117$ , $F = 8.51^*$	0.17	0.60	$N = 97$ , $F = 2.75$
	Implementation rate	$N = 88$ , $F = 0.15$	0.21	0.23	$N = 75$ , $F = 0.18$
Publicity	Perceived success	$N = 140$ , $F = 31.24^*$	2.90	3.89	$N = 111$ , $F = 9.92^*$
	Suggestion rate	$N = 120$ , $F = 21.52^*$	0.14	0.59	$N = 97$ , $F = 6.83^*$
	Implementation rate	$N = 90$ , $F = 1.32$	0.18	0.22	$N = 75$ , $F = 1.17$
Management support	Perceived success	$N = 143$ , $F = 28.64^*$	2.93	3.85	$N = 111$ , $F = 8.90^*$
	Suggestion rate	$N = 122$ , $F = 3.22^*$	0.19	0.32	$N = 97$ , $F = 0.32$
	Implementation rate	$N = 90$ , $F = 7.53^*$	0.17	0.30	$N = 75$ , $F = 3.28^*$
Feedback	Perceived success	$N = 143$ , $F = 34.33^*$	2.65	3.57	$N = 111$ , $F = 2.52$
	Suggestion rate	$N = 121$ , $F = 5.19^*$	0.14	0.28	$N = 97$ , $F < 0.01$
	Implementation rate	$N = 89$ , $F = 0.10$	0.19	0.20	$N = 75$ , $F = 0.16$
Rewards — recognition	Perceived success	$N = 139$ , $F = 23.75^*$	2.84	3.61	$N = 111$ , $F = 5.15^*$
	Suggestion rate	$N = 118$ , $F = 3.82^*$	0.17	0.29	$N = 97$ , $F = 1.93$
	Implementation rate	$N = 88$ , $F = 0.05$	0.21	0.21	$N = 75$ , $F = 1.10$
Rewards — monetary	Perceived success	$N = 138$ , $F = 4.08^*$	3.06	3.48	N/A
	Suggestion rate	$N = 116$ , $F = 2.29$	0.18	0.29	N/A
	Implementation rate	$N = 86$ , $F = 0.98$	0.21	0.16	N/A

Table 4. (Continued)

Design feature	Measure of effectiveness	Direct effects <sup>a</sup> of design features and estimated (low/high) marginal means/rates			Unique effects <sup>b</sup> of design features
		Effect	Low	High	
Rewards — non-monetary	Perceived success	$N = 134, F = 31.34^*$	2.95	4.00	$N = 111, F = 17.14^*$
	Suggestion rate	$N = 113, F = 9.26^*$	0.16	0.46	$N = 97, F = 4.54^*$
	Implementation rate	$N = 84, F = 0.06$	0.21	0.22	$N = 75, F = 0.23$

\*Statistically significant at  $p < 0.05$  level (one-tailed test).

<sup>a</sup>Control variables used are log age of scheme, log total company employees in 2000 and type of scheme.

<sup>b</sup>Controlled for log age of scheme, log total company employees in 2000, type of scheme and the effects of all other design features; Hypothesis 2.

1 ( $F = 3.22, p < 0.05$ ) and implementation of ideas ( $F = 7.53, p < 0.05$ ), than those offering a low level of support.

### 3 *Feedback*

5 The extent of feedback is positively related to scheme effectiveness. Those compa-  
 7 nies offering a high level of feedback (from at least one of the specified possible  
 sources) recorded significantly higher perceived success ( $F = 34.33, p < 0.05$ )  
 and a significantly higher suggestion rate ( $F = 5.19, p < 0.05$ ) than those that did  
 not. There is no significant difference in implementation rate.

### 9 *Rewards*

11 The three types of rewards were first analyzed separately to establish their effects,  
 and then together to investigate whether additive use of rewards is beneficial. That is  
 13 we examined whether the effect of each type of reward is independent of the others  
 or whether they all account for the same variance in effectiveness scores or rates.  
 15 We also examined whether the use of one type of reward increased the effectiveness  
 of another type (i.e., to identify any interactions between use of different types of  
 rewards).

17 When the three reward types are considered separately, recognition is a signifi-  
 cant positive predictor of perceived success ( $F = 23.75, p < 0.05$ ) and suggestion  
 19 rate ( $F = 3.82, p < 0.05$ ). Non-monetary rewards follow the same pattern: they  
 are significantly positively related to perceived success ( $F = 31.34, p < 0.05$ )

18 *D. J. Leach, C. B. Stride & S. J. Wood*

1 and suggestion rate ( $F = 9.26, p < 0.05$ ), but not to the implementation rate.  
2 Monetary rewards are unrelated to both suggestion and implementation rates at  
3 the  $p < 0.05$  level, though their positive relationship with perceived success is  
4 significant ( $F = 4.08, p < 0.05$ ).

5 The three reward variables were then entered together as predictors for each  
6 effectiveness measure, to assess their combined effect and the unique contribution  
7 of each reward type. The combined effect of the three reward variables is a significant  
8 predictor of perceived success ( $F \text{ Change} = 15.65, p < 0.05$ ), but only the unique  
9 effects of non-monetary rewards and recognition are significant in themselves at  
10 the  $p < 0.05$  level. When predicting suggestion rate, the rewards variables together  
11 significantly improve the fit of the model, but again only the effect of non-monetary  
12 rewards is significant at the  $p < 0.05$  level ( $F = 6.21, p < 0.05$ ). The combined  
13 effect of the three reward variables is not a significant predictor of implementation  
14 rate, nor are any of the effects of the different reward types. Of the three types  
15 considered, non-monetary rewards and recognition are clearly positively related to  
16 both perceived success and suggestion rate. There is less evidence than expected of  
17 the beneficial effect of monetary rewards.

#### *The combined effect of design features*

19 Having considered each design characteristic individually, we then examined their  
20 unique effects on scheme effectiveness. These effects were assessed by entering  
21 all the variables representing the five design features, namely planning, publicity,  
22 support, feedback, and rewards (both recognition and non-monetary), as predictors  
23 of effectiveness. Perceived success, suggestion rate and implementation rate were  
24 each modelled in turn. The extent of monetary rewards was excluded since its effect  
25 had already been shown to be non-significant.

26 The unique effects of each of the design features on each measure of scheme  
27 effectiveness are summarized in Column 6, Table 4. If scheme effectiveness is mea-  
28 sured by perceived success, all the design features, with the exception of feedback  
29 make a statistically significant unique contribution at the  $p < 0.05$  level. Together  
30 they account for an additional 45.9% of the variance in perceived success on top  
31 of that accounted for by organizational size, and the age and type of scheme. The  
32 effect of feedback was, however, now statistically significant only at the  $p < 0.1$   
33 level, which is due to the combined influence of the other design variables, all of  
34 which share medium-sized correlations with perceived success ( $0.2 < r < 0.4$ ),  
35 rather than one having a dominant effect. All design characteristics thus contribute  
36 to the perceived success of a scheme. In contrast, when predicting suggestion rate  
37 from all five design features, only the level of publicity and non-monetary rewards  
make a significant unique contribution at the  $p < 0.05$  level. For implementation

1 rate, only the level of management support makes a significant unique contribution  
2 at the  $p < 0.05$  level. The pattern of results therefore offers partial support for  
3 Hypothesis 2.

### Hypothesis 3: The effect of scheme type independent of design features

5 In this section, we report our analysis of the relationship between scheme type  
6 and effectiveness, taking into account the effects of all five design features. Hav-  
7 ing controlled for the design features, scheme type predicts perceived success  
8 ( $F = 4.39, p < 0.05$ ). This effect is marginally stronger than that found in our  
9 initial model that excluded design features, though this increase is largely an arte-  
10 fact of a change in the sample (listwise deletion of cases with missing data on  
11 any of the design features reduces the sample by roughly 20%). If the original  
12 analyses excluding the design features are repeated on this sub-sample, the effect  
13 of scheme type ( $F = 4.11, p < 0.05$ ) is greater than it was for the full sam-  
14 ple ( $F = 2.23, p < 0.1$ ). The estimated marginal means show the same pattern as  
15 before, namely that work systems do better than the other three types of scheme (see  
16 Table 3, row 2).

17 The results for suggestion and implementation rates are consistent with those  
18 for perceived success. Including the design features in the model does not decrease  
19 the effect of scheme type when effectiveness is measured by either suggestion rate  
20 ( $F = 5.93, p < 0.05$ ) or implementation rate ( $F = 2.29, p < 0.1$ ). In both  
21 cases the effect is actually stronger than that found in the original model not con-  
22 taining the design features. This increase, though, cannot be entirely attributed  
23 to a change in the sample, as was the case for perceived success. The pattern of  
24 estimated marginal suggestion and implementation rates is unchanged between  
25 samples, with the values for decentralized schemes greater than those for infor-  
26 mal schemes or work-based systems, which in turn are estimated as more pro-  
27 ductive than centralized schemes. The estimated marginal means and rates are  
28 given in Table 3 (rows 4 and 6, respectively). The overall pattern of results  
29 (including those that relate to Hypothesis 2) indicates that Hypothesis 3 can be  
30 accepted.

31 In addition we tested to see if scheme type affected the strength of the effect of the  
32 design features on effectiveness and found that, with one exception, it did not vary  
33 by the type of scheme. The exception was the relationship between feedback and  
34 suggestion rate (the interaction between scheme type and feedback was significant  
35 at the  $p < 0.05$  level). More specifically, feedback has a very strong positive effect  
36 for decentralized schemes, a less powerful but still positive effect for work systems  
37 and informal schemes, and almost no effect for centralized schemes.

**1 Hypotheses 4 and 5: Interactions with planning and publicity**

3 Having considered the main effects of the design features, we then tested the  
4 hypotheses based upon interactions between them, specifically whether either lev-  
5 els of planning or publicity affect the relationships between the other features and  
6 scheme effectiveness. As before, we controlled for the effects of organizational size,  
7 age of scheme and scheme type before assessing the main and interaction effects.

8 No significant interaction effects were found between the extent of planning and  
9 any design feature for any of the effectiveness measures. Thus, Hypothesis 4 can be  
10 rejected. This result is repeated for publicity, but with two exceptions: the positive  
11 impact of support and recognition on perceived success are both stronger when  
12 publicity is low than when it is high. Hypothesis 5, therefore, can be rejected.

**Hypotheses 6 and 7: Learning culture**

13 Finally, we investigated the effects of learning culture on the relationships of  
14 scheme type and design features with effectiveness. First, we examined the direct  
15 relationship between learning culture and scheme effectiveness. Having controlled  
16 for the effects of organizational size, and scheme age and type, learning culture itself  
17 is significantly positively related to perceived success of the scheme ( $F = 8.20$ ,  
18  $p < 0.05$ ), but not to either suggestion or implementation rate.

19 Second, we examined whether learning culture moderated the relationship  
20 between type of scheme and effectiveness (Hypothesis 6), controlling for orga-  
21 nizational size and age of scheme. The product of learning culture and scheme type  
22 represented the moderation effect. Although the findings reveal no (significant) mod-  
23 eration effect for perceived success ( $F = 1.96$ ,  $p < 0.15$ ), it nonetheless accounts  
24 for 3.8% of the variance. Examination of the plot suggests that the relationship  
25 between learning culture and success is stronger for centralized and decentralized  
26 schemes than for work-based systems and informal schemes. The moderation effect,  
27 however, was significant in predicting suggestion rate ( $F = 3.14$ ,  $p < 0.05$ ); that is,  
28 the relationship between learning culture and suggestion rate is stronger for decen-  
29 tralized schemes than for the others. There is no evidence of any similar moderation  
30 effect when predicting implementation rate. Hypothesis 6 is therefore rejected, as  
31 we predicted that the form of the interaction(s) would show a strong, positive effect  
32 for work-based systems.

33 Third, we examined the extent to which learning culture moderated the  
34 relationship between the design features and scheme effectiveness (Hypothesis 7),  
35 controlling for organizational size, and scheme age and type. The interaction term  
36 was the product of learning culture and use of the relevant design feature. Significant  
37 effects were found for management support and rewards. The interaction between  
38 learning culture and support is statistically significant for both perceived success

1 ( $F = 6.65, p < 0.05$ ) and suggestion rate ( $F = 10.75, p < 0.05$ ), but not for  
implementation rate. If measured by two of the outcome measures, the predicted  
3 effectiveness of a scheme (adjusted for the control variables) is strongly related to  
management support when learning culture is low, but the importance of support  
5 is diminished as learning culture increases. Likewise, if learning culture is low, the  
estimated marginal means of perceived success are significantly higher for those  
7 companies where rewards, defined by recognition, are higher than for those where it  
is low ( $F = 6.48, p < 0.05$ ). As learning culture increases the difference between  
9 the two groups is reduced. This effect is mirrored for suggestion rate but is not  
significant. The pattern of results indicates that Hypothesis 7 can be rejected, as the  
11 interaction effects are contrary to expectations.

### Discussion

13 The aim of this study was to examine the effectiveness of different types of idea  
capture scheme. The findings partially support the hypotheses. Diversity across the  
15 schemes in effectiveness was found for suggestion rate, and to a lesser extent for  
perceived success. For these measures, the results indicate that work systems do best  
17 (Hypothesis 1). With regard to implementation rate (Hypothesis 1), no effect was  
observed. Type of scheme was also found to predict effectiveness (perceived success,  
19 suggestion rate and, to a lesser extent, implementation rate) beyond that accounted  
for by the design features (Hypothesis 3). Although work-based systems are the  
21 best with regard to overall success (consistent with the results for Hypothesis 1),  
decentralized schemes are found to have the highest suggestion and implementation  
23 rates. The effectiveness of both decentralized and work-based schemes could stem  
from the fact that they are managed locally. Overall, though, the pattern of results  
25 (Hypotheses 1 and 3) indicates that decentralized schemes and work systems are  
more effective than informal and centralized suggestion schemes.

27 The findings, though, showed that the design features themselves independ-  
ently predicted effectiveness, primarily perceived success and suggestion rate  
29 (Hypothesis 2). This finding implies that regardless of type, schemes that had higher  
levels of the design features were more likely to be effective. Only management sup-  
31 port, however, independently and uniquely predicted the implementation rate.

33 The results of the analysis of the interaction between design features also revealed  
that two of the design features, namely management support and recognition, adopt  
35 a compensatory role. In other words, the findings showed that when publicity and  
learning culture is low, rather than high, these design features have significant  
effects. This pattern of findings was unexpected because we hypothesized that at  
37 low levels of publicity and learning culture, when employees are more likely to be

1 unaware of the scheme's existence or unresponsive to it, the amount of support and  
recognition would have no effect.

### 3 **Limitations and future research**

5 The first limitation is that the study was cross-sectional in design, which provides  
the findings support the direction of causality assumed, although (reverse)  
7 interpretation cannot be ruled out — with the plausible exception of planning. More  
specifically, the findings could be interpreted as indicating that once a scheme has  
9 been seen to be working well it receives greater levels of publicity, support, and  
other design features. There is a need, therefore, to conduct longitudinal studies,  
11 to demonstrate a causal link between the design features and scheme effectiveness.  
Such studies should measure the design features and suggestion and implementation  
13 rates over a period of, say, 12 months. This would allow the effect of any change in  
level of design features to be evaluated.

15 The second limitation concerns the extent of missing data for suggestion and  
implementation rates (25 and 45%, respectively). This is a concern, particularly  
17 in respect of the implementation rate, because the reduced sample means that  
significant effects are harder to detect. This notwithstanding, the sample sizes  
19 reported were adequate for suitable analyses to be performed. Furthermore, the  
pattern of results complements other studies of suggestion making and innovation  
21 (Axtell *et al.*, 2000). Future studies, though, should aim to involve organizations  
that comprehensively record the effectiveness of their idea capture scheme(s).

23 The amount of missing data, however, does indicate that many organizations do  
not routinely record data concerning the outputs of their idea capture scheme(s).  
25 On the one hand, this suggests that a significant number of organizations might  
not be able to determine the worth of their schemes; on the other, it may indicate  
27 that effectiveness is recorded or evaluated in some other way. The relatively small  
amount of missing data with regard to overall scheme success (10%) suggests that  
29 most organizations are aware of the effects of their scheme(s).

31 The third limitation concerns the reliance on a single respondent from each orga-  
nization to provide the data, particularly on the design features, which can produce  
strong correlations between measures. For instance, an individual possessing a pos-  
33 itive opinion of idea capturing may respond favorably to all items. The opposite  
holds for those possessing a negative opinion. The underlying problem is that this  
35 form of bias, or same-source variance, reduces objectivity. Nonetheless, the fact that  
the correlation coefficients between the design features are either weak or modest  
37 (shown in Table 2) and that we found some moderated relationships in our data sug-  
gests that same-source variance was not a problem in the present study. However,

1 using multiple respondents or researchers' independent audits of organizational  
practice, where appropriate, could add to the reliability of studies.

3 The fourth limitation concerns our focus on the principal type of idea capture  
scheme used. In reality, organizations may simultaneously use several types of  
5 schemes. They could use centralized or decentralized suggestion schemes to capture  
ideas on any topic, as well as, say, quality circles for specific issues. As such, a  
7 comparison of the different combinations of schemes used across organizations  
would be worthwhile.

9 The fifth limitation relates to the relative absence of contextual information; that  
is, whether schemes are part of a specific (broader) initiative such as gainsharing and  
11 total quality management, or whether they are stand-alone. It is plausible, however,  
that schemes embedded within such initiatives receive a greater number of ideas  
13 than those that are not. It is also possible that different types of initiatives have  
different effects on scheme effectiveness, and thus future studies should assess  
15 whether schemes that form part of a broader initiative are more effective.

17 Future studies should also consider three additional issues. The first concerns the  
measurement of scheme effectiveness. The hypotheses we have tested are funda-  
mentally concerned with the supply of ideas. The suggestion rate is clearly a direct  
19 measure of this supply, whereas the implementation rate and the success measure  
reflect the interaction between the supply and the demand for such ideas. Insofar  
21 as the design features are successful at producing a congruity between management  
and worker's expectations, a model of the predictors of suggestion rate should be  
23 applicable to the other measures. This, however, is unlikely to be the case. The  
demand for ideas is subject to a range of influences, which may account for the  
25 lack of an implementation effect in the present study. Amongst these will be the  
filtering process that eliminates duplicate ideas, or ideas where the costs, which  
27 may not be apparent to the person making the suggestion, outweigh the benefits.  
Financial constraints, for instance the availability of funds, will also dictate the num-  
29 ber of ideas implemented. Given such constraints on the extent to which ideas are  
implemented, we suggest that future studies examine additional aspects of scheme  
31 effectiveness, such as the total savings per idea per year or increases in produc-  
tivity and profits that might arise from the use of ideas, which capture the relative  
33 magnitude of ideas implemented and the capacity of schemes to produce beneficial  
ideas.

35 The second issue concerns feedback. This study was interested in how much  
information was given to employees on their ideas. We propose that future studies  
37 should not only consider the quantity of feedback, but also its quality in terms of  
timeliness, detail and clarity. This would enable examination of synergies amongst  
39 the various facets of feedback (e.g., whether quality moderates the relationship of  
quantity with scheme effectiveness).

24 *D. J. Leach, C. B. Stride & S. J. Wood*

1 The final issue concerns patterns in suggestion making. It would be worthwhile  
 2 to examine whether upturns in suggestion making follow publicity and to scrutinize  
 3 the nature of ideas collected. In terms of the latter, based on Arthur and Aiman-  
 4 Smith's (2001) terminology, ideas could be coded as first- and second-order. First-  
 5 order ideas refer to suggestions regarding the improvement of existing equipment  
 6 and ways of working. Second-order ideas concern suggestions for new patterns of  
 7 work. It would be useful to examine whether the nature of suggestions changes over  
 8 time and to assess the extent to which the type of scheme and its design features  
 9 affect the kind of ideas submitted.

### Conclusion

11 We have assessed the relative importance of types of idea capture schemes and  
 12 their design features as means of collecting employees' ideas. Our findings can  
 13 be used to inform scheme selection and design and to improve schemes that are  
 14 already in operation. The percentages reported in Table 2 show that high levels  
 15 of planning, publicity, support and non-monetary rewards across the scheme types  
 16 are currently not that common and suggest that there is scope for improvement  
 17 within organizations. The results suggest that particular attention should be given  
 18 to publicity and non-monetary rewards, though all design features are important for  
 19 ensuring schemes that are used by employees.

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26 D. J. Leach, C. B. Stride & S. J. Wood

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