Owing to company time restrictions and concentration on project development, we began to reduce the duration of creative problem solving (CPS) sessions, and to give more emphasis to the action planning stage. Several changes in our CPS protocol, as well as in its duration, begged the question as to whether these changes were jeopardizing efficacy. To examine this question, six groups of ten university students, working under two different CPS protocols (a five-step method and a four-step method), and three control groups (using no CPS method), were given the same objective and similar conditions. This exploratory experiment compared group performance by change in team commitment, divergent thinking preferences, productivity and the participants’ evaluation of the different methods. Results show that the CPS methods were both effective in changing participants’ perspectives regarding divergent thinking and team commitment. In the control groups, however, there were no changes as a consequence of the sessions. Results also suggest that the same problem-solving effectiveness can be attained in a shorter time than that traditionally used, and without prior training in CPS. These findings open the door to developing new problem-solving techniques and team work processes, and to more efficient organizational creativity and innovation methodologies.

Introduction

This paper reports the path that led to a creative problem solving (CPS) protocol with reduced session time, without loss of efficacy, developed to meet the demands of contemporary fast-paced organizations.

A primary motivation for our research was the need for a CPS methodology that did not require more than a half hour break between sessions, thus avoiding frequently experienced problems regarding team stability. The main reason this problem arises is the difficulty in retaining company managers and specialists for long periods. Also, in our experience, the presence of external consultants as CPS team members is becoming more frequent. This exacerbates the problem of group stability, as these consultants frequently also have commitments to other organizations. The use of CPS group members external to the organization also introduces the issue of project commitment and tenure, as consultants will often only be hired for a portion of the project and may not stay to its conclusion.

Finally, again in our experience as CPS facilitators, corporate demands are often not related to new product or service ideas, nor about team creative thinking or facilitation training, but in solving common problems. These frequently pertain to areas such as internal efficiency, communication and conflict, or intra-organizational relationships. Project development, rather than idea production, becomes the core issue, then, leading us to concentrate on action planning and project management, rather than the ideation phase of the problem-solving process. Nevertheless, in addressing the question, Can changes be made in the structure or duration of...
CPS, without loss of effectiveness?, we based our problem-solving protocol on Basadur’s CPS model (Basadur, 1987), as it has been extensively researched and has been subject to several adaptations (see, for instance, Walton, 2010).

Building on the ideas of Sousa, Monteiro and Pellissier (2009), regarding team member commitment and divergent thinking, the present research explores changes to the CPS process structure and duration versus effectiveness, as measured by team commitment (West, 2003), divergent thinking performance (Basadur, Pringle & Taggart, 1999), and process output (Besemer & O’Quin, 1987).

Structure and Effectiveness of Creative Problem-Solving Methods

The foundations for brainstorming, laid by Alex Osborn (Osborn, 1957), have resulted in the most commonly used methodologies for the generation of new ideas. Although idea generation is of commercial and other value in its own right, brainstorming is also a critical stage in creative problem solving (CPS) processes (Osborn, 1963). CPS is not always about solving problems, per se, and was originally conceived by Osborn as a series of steps comprising Fact-Finding, Idea-Finding and Solution-Finding, designed to make explicit the stages involved in the creative process. Best known as Osborn-Parnes CPS (Parnes, 1967), the method evolved to more complex constructions and was adopted by many consultants, practitioners and researchers, and considered one of the most widely influential creative process models, as reported by Puccio and Cabra (2010).

The effectiveness of CPS techniques has been the subject of investigation by several researchers, as reported by Puccio et al. (2006). Regarding structure, CPS evolved from Osborn’s original three-step model to the Osborn-Parnes five-step model, comprising Fact-Finding, Problem-Finding, Idea-Finding, Solution-Finding and Acceptance-Finding. Later, the sixth stage of Mess-Finding was added (Isaksen & Treffinger, 1985), and organized in three broad categories: Understanding the challenge, Generating ideas and Preparing for action (Isaksen & Treffinger, 2004). These categories and the six-step version formed the basis of the Ecological Approach, designed by Isaksen, Puccio and Treffinger (1993), and the Thinking Skills Model, by Puccio, Murdock and Mance (2005), where the categories were: Clarification, Transformation and Implementation.

Even though CPS methodologies tend to follow the classic steps, practitioners often make adaptations to suit specific situations (Van Gundy, 1987; Buijs, 2002; Buijs, Smulders & van der Meer, 2009). For instance, an emphasis might be placed on problem definition (Getzels, 1987), solution or idea finding (Gordon, 1992) or both (Getzels, 1992). There are also adaptations regarding the use of divergent (McPherson, 1992), or convergent (Firestien & Treffinger, 1992) thinking tools.

Process Adaptation (Five-Step Model)

Based on Osborn-Parnes CPS, Basadur’s (1987) Simplex model, illustrated in Figure 1, views CPS as a cyclical process, comprising eight steps within three distinct phases. Within each step, time is allocated for divergent thinking when individuals or groups generate as many ideas or options as possible. This active divergence period (symbolized by ‘<’ in Figure 1), is designed to be conducted in a supportive atmosphere, in which the judgement of ideas is deferred to allow the perception of new relationships between facts. Also, participants are encouraged to avoid stopping idea generation too early in order to maximize the number and diversity of the ideas produced. Next there follows a stage in which convergent thinking is requested (symbolized by ‘>’ in Figure 1), when participants are encouraged to judge and select one or more ideas to carry forward to the next step.

During several organizational trials, teams were found to duplicate their answers to different questions that we had posed as ‘thought triggers’, during the divergent thinking steps, as suggested by Sousa and Monteiro (2010). For instance, during Fact-Finding the facilitator might ask, ‘What do you know, or think you know, about this fuzzy situation?’ ‘Why is this a problem?’ Or, ‘What solutions have you considered or tried?’. In order to eliminate this
redundancy, we reduced the number of questions. Also, Basadur's model was reduced to five steps (Figure 2), in order to adapt it to a three four-hour session design: one training session; one Fact-Finding and Problem-Definition session; and the last session for Idea Generation, Decision Making and producing an Action Plan. In the revised model we considered the project objective, defined by management during an earlier interview (the 'pre-consult'), and the Action step, where the decision is implemented, were not included in the group use of CPS, in this study.

After several corporate trials aimed at testing the model and collecting data, we questioned the need for the training session. This was partly because the training topic was not a real-world problem (which Grossman and Wiseman [1993] consider of little value for training), and partly because there was a strong resistance from the participating companies to having teams devote twelve hours to our experiment. Therefore, the training session was eliminated and the time taken for the intervention reduced to two four-hour sessions. During the trials, our subjective assessment was that this change in the protocol seemed to have no significant effect on the performance of the teams, provided the facilitator was a skilled process specialist. Our perception was that the intervention itself contained enough training for the subsequent performance of the groups, supporting the findings of Baruah and Paulus (2008), and Smith (1993).

However, the two four-hour sessions (normally over two non-consecutive days), required by teams to work through the revised CPS method, were still considered a potential barrier to the intervention, because of the difficulty mentioned earlier, regarding assuring continuity of the five to ten managers or technical specialists as team members. Also, it became evident that facts, ideas, problems and solutions were sometimes repeated across stages, and were thus redundant. For instance, in the Fact-Finding stage, a ‘fact’ such as, There is no system of integration for client suggestions, is similar to the ‘problem’, In what ways might we create a system to integrate client suggestions?, and to the ‘solution’, To develop a system that can integrate client suggestions. Moreover, many contributions were discarded during convergent phases and, thus, had no value other than to contribute to team building, as the diverge-converge exercise offered opportunities for team members to exchange views and arguments, leading to close interactions. Therefore, if commitment among team members, which is essential to team production and decision implementation (Cosgriffe & Dailey, 1969; West, 2003; West, Sacramento, & Fay, 2006), and the improvement of divergent thinking skills can be maintained despite step reductions, the elimination of time spent in sessions can only have beneficial consequences.

CPS affords the opportunity for team members to express themselves freely, it is primarily a work discipline (Isaksen, Puccio, & Treffinger, 1993), and is dependent upon a distinct and effective leadership style, through which a skilled facilitator draws the best out of each team member. Even trying to define the problem too early in the process, as Grossman and Wiseman (1993) explain, has little value, since only in the last stage of Verification (following Preparation, Incubation and the ‘Aha’ stages), can the problem be redefined. According to these authors, only a modest period of time should be devoted to an early definition of the problem, and even the Fact-Finding stage may be of little use.

The Four-Step Model

With the goal, then, of increasing efficiency by reducing session time, and also owing to theoretical considerations, a new four-step model was designed. As shown in Figure 3, this comprises the steps: Objective-Finding, Problem-Definition, Action-Planning and the Action itself. However, as the Objective-Finding step is completed during the pre-consult and as implementation occurs after the CPS session, the process is reduced to only two steps: Problem-Definition and Action-Planning. Using this new cycle, the time taken for team meetings is cut...
by more than half, with a typical session taking four hours or less. Another positive outcome is that the new model focuses team members on implementation, including development of an execution plan, with management control measures, as well as communication and acceptance related tasks. This approach provides an initial structure for the group, during the divergent phase of Problem-Definition, followed by an emotional linkage between members, as efforts are focused on reaching consensus, during the convergent phase of Problem-Definition. Another structuring step follows during Action-Planning, when team members’ creativity is expressed during the ‘how to?’ development of each task in the plan.

Although the sequence of divergence and convergence is maintained, it is only explicitly used during Objective-Finding (with the client) and Problem-Definition steps. During Problem-Definition, the team enumerates all possible barriers to reaching the objective and then selects a final problem definition to work with, beginning with the expression, What are the steps necessary to . . .? This question, also suggested by Belsky (2010), instead of, In what ways might we . . .?, focuses the team on seeking concrete tasks instead of more esoteric solutions.

During Action-Planning, the team starts by listing all actions needed to achieve the goal, and then puts them in order of execution. For each task, the ‘how to?’ question is defined in such a way as to include any actions necessary to overcome resistances that might arise. Each task is assigned to a sub-team, which defines deadlines as well as the person or entity responsible for evaluation of the final output.

The establishment of an effective communication structure (e.g., Google groups, Wikis), within the team, facilitates the collective awareness of what each team member is doing.

Also, advertising the project within the organization (e.g., via an intranet newsletter or internal marketing supports) reduces organizational resistance to task accomplishment and increases peer pressure for the team to comply with the project’s milestones and goals.

The acceptance plan, aimed at overcoming resistance from non-team members (sometimes considered the most likely cause of failure; e.g., Buijs, Smulders & van der Meer, 2009), is considered for each task, as reported. But the most beneficial factor in resistance reduction is the inclusion of those who may be affected by the project outcomes, have the power to help it or block it, or possess information or expertise relevant to the project (Strauss, 2002).

Adopting this novel approach to CPS, in terms of structure and duration, required the inclusion of an evaluation component, to assess effectiveness compared with the five-step (eight-hour) model. We decided to submit both protocols to similar conditions, along with a control group which was subjected to no intervention. To evaluate effectiveness, we measured team commitment, divergent thinking, participant evaluation and outcome quality (action plan), as already reported.

Our hypothesis, then, is that our shorter CPS model, in which the stages of Fact-Finding, Idea-Finding and Decision-Making are eliminated, results in no reduction in divergent thinking performance, quality of final output and team commitment.

**Method**

An experiment was run to compare group performance regarding divergent thinking, quality of final output, and team commitment, before and after the intervention, along with participants’ self-assessment of each method’s effectiveness.

Nine groups of 10 or 11 university students, working under two different methods (five-step method or four-step method) and a control condition (no method), were put in similar working conditions and given the same objective:

Monica is a young lady who has just graduated in the area of marketing. She is anxious to use her knowledge and prove her worth. Luckily, in the company where she works as secretary to the production manager, the marketing manager has made her an invitation to join the marketing team. She is thrilled about the possibility but her boss says he cannot let her go without a replacement. As there is a freeze on new hires, as
well as new outsourcing, the situation is complicated.
What can she do?
Consider yourself a member of the group that has been invited by Monica to help solve her problem.

Participants

Ninety-three first-year students (who had already been studying together for about two months), from two universities, were assigned to groups with 10 or 11 students per group, on a random basis. Three groups, totalling 30 students, were from a management undergraduate course at a private university (aged 23 to 37 years, mean 32 years, mostly working professionals, 13 women, 17 men). Another six groups, totalling 63 students (aged 18 to 25 years, mean 20 years, almost all without work experience, 34 women, 29 men), were enrolled in a tourism management course at a public university.

Instruments and Procedure

The experiment was explained to everyone and groups were sent to separate rooms, where two of the authors facilitated the CPS sessions. Control groups (no method) had to designate their own facilitators, who were instructed to simply discuss the problem and formulate a plan to solve it. The groups using the four-step protocol and the control groups completed the task in the same session (four hours), while the three five-step CPS groups ran a second session one week later with the same facilitator. It was not possible to run both sessions closer together because of class schedules. Also, running the two sessions over two different days is normal in company situations, so the present format was considered realistic. Both facilitators ran groups using both methods in order to reduce the possibility of facilitator effects. All sessions, then, lasted four hours, with a half-hour break.

Two questionnaires were administered twice to all groups, once before the session (Observation O1), and once after (Observation O2), and the effectiveness of each method was measured by comparing the difference between O1 and O2.

One questionnaire was a 14-item divergent thinking instrument, adapted from Basadur and Finkbeiner (1985), with two subscales: Tendency for Premature Critical Evaluation of Ideas (all items R-reverse) and Preference for Ideation. Each item is scored on a five-point Likert-type scale (1 = Totally disagree to 5 = Totally agree), with the higher number indicating preference for divergent thinking. A 13-item team commitment questionnaire, based on Meyer and Allen (1997), was also administered. It was adapted to the Portuguese population by Almeida, Faisca and Jesus (2007), and contains three subscales (Affective, Normative and Instrumental Commitment), with items scoring from 1 = Totally disagree to 7 = Totally agree, higher scores indicating higher team commitment.

The results of the two questionnaires were subjected to analysis of variance and, at the end of the last session, participants were asked to evaluate and express their opinion about the process. These responses were content analysed and the results categorized. Fifteen categories were retained as significant for the analysis, allowing for a deeper comprehension of responses and also the drawing of perceptual maps, using DTMc40 software and factor analysis of correspondence (Lebart et al., 1993). This statistical technique, as stated by Hair et al. (1987), allows the reduction of complexity by displaying sets of attributes (content analysis categories) in a four-quadrant space, thus generating a perceptual mapping of text significance, together with the positioning of the independent variables (in this case the methods and the control).

Three judges independently evaluated the problem definition, solution and/or action plan of each group against the criteria suggested by Besemer and O’Quin (1987) of Originality (new concepts, processes or materials), Resolution (degree to which the solution solves the problem, i.e., usefulness), and Elaboration (refinement, synthesis and elegance). The average intra-class correlation coefficient (ICC) was calculated to appraise the judges’ agreement.

Results

In Table 1 the results of t-tests, before and after CPS sessions, for Tendency for Premature Critical Evaluation of Ideas and Preference for Ideation are compared. As shown, when compared to the control group, both of the CPS methods had a significant impact on divergent thinking attitudes, but while in the five-step method both divergent thinking attitudes were significantly changed, in the four-hour session significant changes only occurred in Preference for Ideation.

Regarding team commitment, Table 2 shows the results of a t-test made to the means of the factors: Affective Commitment, Normative Commitment and Instrumental Commitment, before and after the CPS sessions. All three factors show significant differences in the four-step condition, and only Affective Commitment shows differences in the five-step condition.
Once again the control groups showed no changes.

To test the influence of other variables, we analysed possible confounds resulting from differences in student characteristics between institutions (one public, with younger students; and one private university, with older students), and also regarding the facilitators (although we had taken precautions to try to control for facilitator effects). We compared the groups from both institutions, in each of the five measures (two divergent thinking factors and three commitment factors), scored pre- and post-sessions, and no significant differences were found, except between scores for the measure Tendency for Premature Critical Evaluation of Ideas, obtained before the sessions. Here, the group of 30 students from the private institution scored a mean of 3.5; and the 63 students from the public school scored 3.1 (both groups differed at $p < 0.04$). As to the facilitators, the only difference found was in the scores of the factor Preference for Ideation, with the participants of one facilitator scoring a mean of 2.3 in the pre-session and 2.1 for the others ($p < 0.03$). In the post-sessions, means were 2.8 and 2.4, respectively ($p < 0.04$). These analyses did not reveal significant differences between institutions or students, except with regard to divergent thinking attitudes, which seemed higher among the older students from the private university.

### Table 1. Mean Differences and Their Significance Level, Before and After CPS Sessions, for the Factors ‘Tendency for Premature Critical Evaluation of Ideas’ and ‘Preference for Ideation’

<table>
<thead>
<tr>
<th>Condition</th>
<th>Moment</th>
<th>N</th>
<th>Preference for ideation</th>
<th>Tendency for premature critical evaluation of ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 h</td>
<td>Before the sessions</td>
<td>32</td>
<td>2.31</td>
<td>3.59</td>
</tr>
<tr>
<td></td>
<td>After the sessions</td>
<td></td>
<td>2.71</td>
<td>3.89</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>4 h</td>
<td>Before the sessions</td>
<td>30</td>
<td>2.18</td>
<td>3.80</td>
</tr>
<tr>
<td></td>
<td>After the sessions</td>
<td></td>
<td>2.40</td>
<td>3.82</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td></td>
<td>0.001</td>
<td>0.81</td>
</tr>
<tr>
<td>Control</td>
<td>Before the sessions</td>
<td>31</td>
<td>2.40</td>
<td>3.79</td>
</tr>
<tr>
<td></td>
<td>After the sessions</td>
<td></td>
<td>2.51</td>
<td>3.77</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td></td>
<td>0.19</td>
<td>0.75</td>
</tr>
</tbody>
</table>

### Table 2. Mean Differences and Their Significance Levels, Before and After CPS Sessions, for the Factors ‘Affective Commitment’, ‘Normative Commitment’ and ‘Instrumental Commitment’

<table>
<thead>
<tr>
<th>Condition</th>
<th>Moment</th>
<th>N</th>
<th>Affective</th>
<th>Normative</th>
<th>Instrumental</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 h</td>
<td>Before the sessions</td>
<td>32</td>
<td>4.30</td>
<td>5.44</td>
<td>3.99</td>
</tr>
<tr>
<td></td>
<td>After the sessions</td>
<td></td>
<td>4.45</td>
<td>5.67</td>
<td>4.21</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td></td>
<td>0.05</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>4 h</td>
<td>Before the sessions</td>
<td>30</td>
<td>4.28</td>
<td>4.56</td>
<td>3.36</td>
</tr>
<tr>
<td></td>
<td>After the sessions</td>
<td></td>
<td>4.56</td>
<td>5.00</td>
<td>3.77</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td></td>
<td>0.001</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Control</td>
<td>Before the sessions</td>
<td>31</td>
<td>3.73</td>
<td>4.68</td>
<td>3.01</td>
</tr>
<tr>
<td></td>
<td>After the sessions</td>
<td></td>
<td>4.00</td>
<td>4.71</td>
<td>3.13</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td></td>
<td>0.13</td>
<td>0.89</td>
<td>0.61</td>
</tr>
</tbody>
</table>
Turning now to the quality of solutions provided by the different groups, these were rated by three judges using the criteria suggested by Besemer and O’Quin (1987). The average ICC was 0.81 for Originality, 0.83 for Resolution and 0.88 for Elaboration (all correlations significant at \( p < 0.01 \)). Table 3 shows that both the CPS facilitated sessions were judged to be superior to the solutions generated by the control groups (i.e., total score), and that on every criterion employed to evaluate the product of the sessions, the CPS groups outperformed the control group (i.e., Originality, Resolution and Elaboration). The two CPS groups were not significantly different on two of the three product criteria (Resolution and Elaboration); however, the solutions generated by the five-step groups were seen as being significantly more original when compared to the solutions generated by the four-step groups.

As mentioned, each subject was asked to evaluate the sessions using an open-ended statement. For the 15 categories retained as significant for the analysis, the words were analysed as columns and the individuals (the students) as rows.

As can be seen in Figure 4, the four-step method is associated with knowledge and efficiency; the five-step method with personal, solutions and find; and the control group is connected to interaction. This suggests that the four-step method is considered efficient and knowledge promoting, and the five-step method is deemed to foster personal growth.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Originality</th>
<th>Resolution</th>
<th>Elaboration</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 h</td>
<td>2.9</td>
<td>3.7</td>
<td>3.7</td>
<td>3.4</td>
</tr>
<tr>
<td>8 h</td>
<td>3.5</td>
<td>3.8</td>
<td>4.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Control</td>
<td>1.8</td>
<td>2.2</td>
<td>2.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Significance</td>
<td>0.01</td>
<td>0.01</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Scheffe test: All groups differ in Originality (\( p < 0.01 \)), and the Control group differs from the others in every criteria (\( p < 0.01 \)).

Figure 4. Space Distribution of Categories and Experimental Conditions (Control; 4 h; 8 h) in the Four Quadrants
and help to find solutions. The control groups differ significantly from the other groups, and refer only to the relationship between the students.

Discussion

Although, as with all laboratory studies, external validity can be challenged, our findings corroborate previous fieldwork (Basadur & Finkbeiner, 1985; Basadur, Wakabayashi, & Takai, 1992; Basadur, Pringle, & Kirkland, 2002; Sousa, Monteiro, & Pellissier, 2009; Sousa & Monteiro, 2010). Also, previous research (e.g., Mullen, 1991) suggests laboratory studies probably underestimated the actual effects as they occur in naturally existing groups. The present study generated evidence, then, that CPS methods can be effective in changing individuals’ attitudes regarding divergent thinking, namely by avoiding premature closure, acceptance of other’s ideas and reducing self-censorship. Also, our results showed little dependence on experimental conditions, specifically regarding the nature of the participants and the differences between both facilitators. The present research also added to existing findings in showing that team commitment is enhanced by CPS. The differences between the two experimental methods and the no-method control condition left no doubt that the existence of a method is fundamental to these enhancements, and simply putting groups of people together to try to solve problems does not achieve this. However, the significant differences found in Preference for Ideation between the two facilitators in regard to the post-session outcome might show some degree of difference between them, in terms of their own preferences and abilities, attitudes or skills.

Participants’ own evaluations corroborated the methods’ capabilities in providing an efficient way of organizing knowledge so as to find original solutions to problems. Thus, CPS seems to be an important source of learning and attitude change, with participants advocating its use, both at work (at team and organizational levels) and in their personal lives.

Regarding differences between the five-step CPS method, and the four-step technique, interesting differences emerged. When measuring divergent thinking factors, the eight-hour (five-step) method excels over the four-step (four-hour) in the factor Tendency for Premature Critical Evaluation of Ideas. This comes as no surprise, as the five-step method emphasizes ideation, compared with the four-step protocol. In fact, participants’ attitudes towards premature critical evaluation improved, i.e., they reported being less likely, after the sessions, to prematurely evaluate ideas. This was also described in participants’ evaluations and is visible in the judges’ ratings as well as in the perceptual map. However, when analysing the differences in team commitment between CPS methodologies, the reverse appears to be the case, with the four-step method obtaining better results in every category. This might be due to a greater emphasis on action-related tasks (which tend to be more team-oriented), rather than idea generation (which tends to be more individual in nature), thus generating higher team commitment.

We might even speculate that, during task implementation, teams learn more about creative ways to achieve the objective by balancing problem definition, and problem solving, learning by doing in an iterative, trial-and-error approach. Here the problem-solving process loses importance to the project development stage. In other words, it may be during the action step that real problems are defined, and more creative solutions may be needed, due to the acquisition of new knowledge through action. The ‘Aha!’ may not occur during the initial meeting, then, but many ‘Ahas!’ will happen during plan implementation.

We still would like to call attention to the change in problem formulation from In what ways might we . . .? to What are the steps needed to . . .?. According to normal CPS facilitation, it even helps if the group begins with some ‘crazy’ ideas; but what tends to happen is that these ideas, as with other inappropriate ideas, are ultimately discarded. So, this change in problem formulation is designed to require the group to produce only feasible ideas. This demands a greater effort from team members to think of ways to realistically solve the problem, but once the list is complete and ordered, the work becomes easier, within the frame of ‘disciplined’ creativity.

Regarding the need for previous CPS training, as described, our teams performed well under our experimental protocol, without the need for training in specific creativity skills. But, to our surprise, many of our participants chose to attend creative thinking workshops afterwards, just because they had developed a taste for the subject. Thus, our greatest victory may have been to instil an interest in creativity in people who had little previous interest in the subject.

Limitations

The fact that more than half of the participants were quite young and inexperienced with the
corporate world, does, of course, cast doubt regarding the external validity of the study. However, the tasks presented to participants during the study were quite simple, and did not require specific skills, so we believe that this external validity threat does not significantly influence the validity of the results. The relative simplicity of the problem and subsequent ease of finding solutions might also be causes of concern regarding external validity. However, there are no obvious reasons to believe that the broad pattern of results would not be replicated if more challenging problems were used.

Regarding the volume of data collected, we understand the unit of analysis as being the individual, not the group, thus requiring fewer participants for the required power of the study.

Implications and Future Research

We think that this study has important implications for the CPS practitioner, specifically with regard to the reduction of time spent with the team, and the focus on implementation instead of idea production. Also, it opens new doors for the training of facilitators, the managing of client-team relationships, as well as for developing different views of organizational creativity and innovation, especially when we make links with large group interventions (see, for instance, the similarities between the Strategic Planning Process, reported in Bunker & Alban [1997], and the four-step method presented here).

Regarding future research, we believe there is more to be done in the area of team composition and regards what happens when ideas are implemented, i.e., during the execution of the action plan (see a similar recommendation in De Jong & Den Hartog, 2010). The facilitation of CPS is a special skill that also needs further research, particularly regarding its role in the pre-consult stage, in defining possible strategies for success, and also during the consulting stage with the team, in order to bring the best out of every team member, and to negotiate the balance between the client and the team (Drazin, Glynn & Kazanjian, 1999). Research that tackles these issues cannot but bring important results to the field of creativity and innovation in organizations.

Acknowledgements

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References


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