Participatory ergonomics through work debate spaces: actual contributions

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This article shows a concrete method of participatory ergonomics. This method is founded on the development of debate about the real work. Based on the action research developed in an electric company, this article demonstrates how a work debate space (WDS) contribute to the development of safe situations and learning on the work. After performing a theoretical discussion about the subject, describing the establishment methods and function of WDS within a technical group, we will present the benefits of these spaces for the organization and its employees, and then discuss the minimal conditions for their implementation. According this article, the development of work debate spaces appears as a concrete methodology to illustrate participatory ergonomics.

Keywords: participatory ergonomics, reflective practices, discussion in work, work debate spaces, participatory approaches.

1. Introduction

In the last years, employees see different types of changes in their work. On one hand, local managers find themselves under an obligation of managerial performance, thus distancing them from the technical work site (Journé, 2005). On the other hand, procedures are multiplied in order to compensate the absence of management and to limit the reporting of field information. This can lead to situations where compliance to the rules is difficult or impossible to follow in the case of an unexpected event (Dekker, 2003). One of the possible effects is the development of “organizational silence” The voluntary non-declaration of actual field problems by the operators (Morrison and Miliken, 2000).

To remedy this break of interactions within the collectives, various studies emphasize the importance of reestablishing the work group through the participation of workers (Lewin, 1951; Liker et al., 1989), by engaging reflective practices among them (Schön, 1983; Mollo and Falzon, 2004) and initiating discussions about actual work (Daniellou et al., 2011; Detchessahar and Journé, 2011).

The challenge is thus to develop spaces in which the arbitrages can be collectively discussed between employees in order to transform the organization (Detchessahar, 2001; Rocha, 2014). The present study wishes to implement a new approach of management by a work with managers and operators to co-construct a system from the sharing of experiences and the collective discussion of daily situations. This paper presents the contributions brought by this method.

2. The work debate spaces: a tool for participatory ergonomics

The foundations of participatory ergonomics derive from the organizational theories of human relations. Lewin (1951), a precursor of this topic, argues that changes disrupt the stability of social systems and the
forces that promote change must be greater than their resistance. For him, participation is the best way to conduct this change because the needs of workers can be integrated into the proposed changes.

Wilson (1991) defines participation as the people involvement in the planning and control of a significant part of their own work activities, with the knowledge and the sufficient power of influence to improve the process and the outcomes. Its benefits are many and varied. Patel, Petitt and Wilson (2012) show how trust and collaboration can be enhanced when team members work remotely and communicate via technology. Haims and Carayon (1998) report that an active involvement of participants leads to changes in perception and improves learning and understanding of the work environment. Finally, Wilson (1991) argues that participatory approaches allow a more adequate understanding between colleagues, improve the relationship between the various professional groups and the effectiveness of problems solving.

Participatory ergonomics is carried out in different areas of work, such as in manufacturing environments (Liker et al., 1991), in food sectors (Moore and Garg, 1997), in office sectors (Haims and Carayon, 1998) or in video display terminal workplaces (Westlander et al., 1995). However, its objectives and structures can appear in many different forms from one study to another (Haines and Wilson, 1998). Some studies seek to reduce musculoskeletal disorders (Moore and Garg, 1997), others use participative methods to design work situations (Daniellou, 2003) or to implement new technologies (Liker et al., 1991). Participation can vary from a simple consultation of workers to their involvement in the process of decision-making. The methods used also vary greatly, ranging from little formalized tools to extremely formal methods (Saint-Vincent et al., 2000). In some cases, the approach integrates with existing structures in companies, while mostly new work teams are created.

Whatever the form of the participatory ergonomics, the main objective should be to link two aspects of an organization: the formal, or an organization defined by the leaders through the rules, and the living, or an organization defined by local and temporary regulations constructed by field operators (de Terssac and Lompré, 1996). The question that must be asked is: how to develop participatory approaches that articulate the formal and the living organization? A possible way is the discussion and confrontation of points of view between different stakeholders of the organization around elements of the real work (Rocha et al., 2014).

Daniellou et al. (2011) argue that articulating organizational challenges with other operator constraints is only possible with a working group involving the concerned parties, in order to identify the situations that are particularly difficult to manage, to discuss them within the organizations and to propose changes. Hendry and Seidl (2003) talk about “strategic episode” to mean “a sequence of communications structured in terms of its beginning and ending” in which organizations must be able to “routinely suspend their normal routine structures of discourse, communication and hierarchy, and so create the opportunity for reflexive strategic practice” (p.176). Detchessahar (2001) uses this concept and develops the theory of spaces of discussion, advocating the discussion of work on a regular and protected basis, coordinated by a manager who does not belong to the direct hierarchy. According to this author, work discussions encourage each actor to defend and to share his/her point of view. It may develop mutual learning. This method acts as a “medium that deals
with all the arrangements, compromises and adaptations that suppose the lacks of the prescription incomplete instructions and the implacably erratic nature of concrete activity” (Detchessahar, 2013, p.59).

3. Source of information
The present study is a part of a 3 years research conducted in an electric company. An operational site composed of seven Technicians (TC1, TC2, TC3, TC4, TC5, TC6 and TC7), one Local Manager (LM) and one Local Senior Manager (LSM) was investigated.

All accepted to participate to this study, which was divided into three successive phases:
• A 6 months diagnosis phase, aiming at understanding the context of work. The results showed a weak group dynamic, and an absence of dialogue between electrical technicians and local managers regarding field situations.
• An experimental phase: further to the results of the diagnosis, we experimented a WDS to talk about field anomalies. To guarantee a collective reflection on real work situations, WDS was based on photos collected by the researcher during the first phase. The discussions were facilitated by the researcher and the prevention expert (PE) of the company. This phase lasted two months, including four meetings one hour and a half each, every two weeks.
• An implementation phase: the objective of this phase was to perpetuate the method defined by the agents themselves in the experimental phase. The agents collected anomalies on a daily basis and discussed them together about 25 minutes every week. The researcher followed the process for two months, during four meetings, in order to understand the benefits and the appropriation of WDS by the actors.

During the experimentation and implementation phases, the meetings were recorded, transcribed and then analysed qualitatively and quantitatively. The qualitative analysis consisted in a thematic analysis of the collective debate, like shows the table below.

Table 1: Variables, codes and target definitions for Kronos data analysis.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Codes</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debate Dynamic</td>
<td>Analysis</td>
<td>The debate is centered on the understanding of the origins and the consequences of the risk.</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>The debate is centered on the collective elaboration of solutions.</td>
</tr>
<tr>
<td>Subjects Discussed</td>
<td>General Problem (GP)</td>
<td>The debate focuses on a general problem or a general rule that characterizes a set of field situations.</td>
</tr>
<tr>
<td></td>
<td>Field Situations (FS)</td>
<td>The debate focuses on specific field situations.</td>
</tr>
</tbody>
</table>
The debate focuses on the organization and functioning of WDS.

The session facilitator is speaking.

The participant is speaking.

Field situations include the primer situations (“Ps”) and the similar situations (“Ss”), as represented in table 2. Primer situations are the situations that initiate the debate; they can be reported by the facilitator (“Fac”) or by the technicians (“Techn”). Similar situations are field situations that are reported by participants to illustrate the debate and that look like the primer situation.

Table 2: Variables of discussed field situations.

<table>
<thead>
<tr>
<th>Field Situations (FS)</th>
<th>Primer Sit (Ps)</th>
<th>Similar Sit (Ss)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facilitator (Fac)</td>
<td>Technician (Tech)</td>
</tr>
<tr>
<td>Situation introduced by the debate facilitator</td>
<td>The similar situation reported by the operator concerns the experience lived by a colleague</td>
<td>The similar situation arises from the personal experience</td>
</tr>
</tbody>
</table>

The quantitative analysis, as for it, consisted in identifying the duration of each variable in relation to the total time of the meeting, both in experimental (EXP) and implementation (IMP) phases. To do that, we used Actogram Kronos (Kerguelen, 2003), a chronologically-observed data processing software.

4. Findings
The analysis of the meetings during the implementation phase highlighted a number of contributions of the work debate space. Gradually, we observed an increase in time for discussion of individual situations as illustrated in figures 2 and 3 below. In the experimental phase (left figure), the majority of incidents reported involved third parties (“Ss-Third”). From the third experimental session and in all the phase of implementation (right figure), technicians reported field situations in order to initiate the debate (“Ps-Tech”), as expected by the method, but they also began to report more and more individual examples (“Ss-Ind”).

¹ The % corresponds to the time period of the code in the complete section.
Another striking result concerned the anticipation of risky situations (“Ss-Ant”). If in the first phase the anticipation seemed very small (0.9% in the first meeting), it is present in all the meetings of the second phase. It shows that the participants not only reported more field situations, but also anticipated others in function of the variability of the discussed situation.

This increase in the number of reported and anticipated situations in the WDS created a shared treatment, which is more and more significant. If in the first experimentation sessions the participants were primarily engaged in an analytical perspective to the detriment of their treatment, from the beginning of the third experimental meeting we note a balance between analysis and treatment of situations (figures 4 and 5).

The development of the meetings between the phases reveals a progressive appropriation of the process by the participants, which can be explained by at least three phenomena. Firstly, the analysis of meetings shows an increase of technician participation to the debate (table 3)\(^2\). This is particularly notable for TC3, TC4, and TC5 who do not intervene much in initial meetings, but who often speak during the implementation phase.

\(^2\) The empty compartments mean that the participant is absent in the meeting: TC2 was on sick leave, TC3 and LSM retired, and TC6 was present in an irregular way. We decided to take into account in the results of this study, the agents who participated at least 50% of the sessions, i.e. TC1, TC3, TC4, TC5 and LM.
Secondly, we observe an increased tendency in the exchange between technicians. During the first meetings, the majority intervenes in response to the discussion facilitator. Now, they also raise questions, take part in explanations from colleagues, and take much more initiatives to change or introduce new discussion topics. Thirdly, similar situations (“Ss-Ind”, “Ss-Ant”, and “Ss-Third”) increase gradually in the meetings. This means that from the presented situation, the participants look to the past to share prior experiences and to the future to anticipate situations that may occur. This exchange of experience gives rise to mutual learning, as illustrated by participants’ statements: “we discuss things here that I never saw in my training”; “now I understand”; “I never knew.” This doing, WDS contributes to the transfer of skills between the more experienced and the younger, and the development of the work group through the sharing and the construction of the occupational rules.

5. Discussion

The results presented highlighted right away contributions of participatory ergonomics. Whereas before the report and the management of a field situation there were two distinct processes and no feedback, from now on the group debates the situations, anticipates the possible risks and defines some solutions. The work debate space thus was able to improve the report and treatment of situations by the institution of a group reflection on the reality of work.

This study also shows that the debate about the work permits to develop the competences of the agents, develop the collective and to connect managers with the reality of field situations. Thus, the contributions of the debate about work concern both the individuals and the organization (Daniellou et al., 2011). It allows operators to develop their competences and construct a collective experience. In doing so, it develops their capacity to come up with pertinent answers in real time, and allows them to increase the reporting of and treatment of risky situations. The agents move from the analysis to the treatment situations, then continue into a proactive vision, which they project in future situations from the anticipation of field situations.
Finally, it is necessary to point out that the work debate is not intuitive, it must be learned. In order that the WDS is developed and sustained, several conditions prove necessary both for the guidance of the approach and for the implementation of the WDS. Concerning the guidance, it is necessary that the executive committee be engaged in the process by supplying the technical, organizational, and human means so that the WDS can be instigated. Concerning the conditions for the implementation of WDS, a preliminary diagnosis phase proves necessary, based on observations and interviews with workers, to engage the elements for the development of the WDS. Within these spaces, several conditions are defined by Mollo and Mascimento (2013): a discussion based on real work activity, a joint elaboration and evaluation of solutions based on a dynamic of confrontation, so that people can experience the improvement proposals. Moreover, WDS must be integrated in the existing managerial meetings in order to avoid additional meetings.

References


