

Measuring the impact of a major project management educational program: The PMP case in Finmeccanica

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Abstract

This work aims at providing evidence of the impact of project management training programs. The research focuses on the impact of training effectiveness (higher learning) on the project managers' competencies (applied behaviors). Data have been collected within PMP-Project Management Program: a corporate training program developed and delivered through an academic–industrial collaboration between Politecnico di Milano University and the Education and Human Resources Development Department of Finmeccanica SpA. The program started in 2007 and has involved more than 2300 participants worldwide so far. The empirical analyses are based on an extensive survey conducted one year (rolling) after the training activities. The analysis of the relationships among the different variables provides evidence of the positive impact of training effectiveness on project management competencies. Moreover, the results show that two other variables, role-training matching and environment factors, have a strong conjoint effect, significantly increasing the impact of training on the project management competencies.

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1. Introduction

Organizations are spending more on professional development through corporate development programs targeted to specific communities or professional societies. According to the 2010 ASTD State of the Industry report, U.S. organizations spent \$125.88 billion on employee learning and development in 2009.¹ Additionally, in the project management environment, training and knowledge-transfer programs are gaining more attention, leading researchers to focus on how to design, implement and measure them more effectively (Alam et al., 2008; Ashleigh et al., 2012; Lee-kelley and Blackman, 2012).

How to measure the impact of major training and development initiatives to justify training investments is still an open debate (Hashim, 2001; Lien et al., 2007; Preskill, 1997). The importance of evaluating the training activity objectively and quantitatively is continually stressed in the training literature (Bober and Bartlett, 2004; Noe, 2000; Swanson and Holton, 1999). However, training evaluation is very difficult, and to date, a single best practice has not been identified (McLean, 2005).

Different models have been proposed (Garvin, 1995; Swanson and Holton, 1999), but Kirkpatrick's hierarchical model (Kirkpatrick, 1976, 1994) is the most studied, used and criticized.

The model encompasses 4 levels, each investigating different issues in a training and development program (see Fig. 1):

- Level 1: Reaction. The degree to which participants react favorably to the training. Every program should be evaluated at this level, at least, to answer questions regarding

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¹ <http://www.astd.org/content/research/stateOfIndustry.htm>.



Fig. 1. Kirkpatrick's (1994) 4 levels hierarchical model.

the learners' perceptions and to improve training. This level yields knowledge about whether the participants liked the training and whether they thought that it was relevant to their work.

- Level 2: Learning. The degree to which participants acquire the intended knowledge, skills, attitudes, confidence, and commitment based on their participation in a training event. Level 2 evaluations are conducted before training (pre-test) and after training (post-test) to assess the amount of learning that has occurred.
- Level 3: Behavior. The degree to which participants apply what they learned during training when they are back at work. Evaluations at this level attempt to assess whether the training has been transferred back to the job. This evaluation should be performed at least 3 to 6 months after training.
- Level 4: Results. The degree to which targeted outcomes occur as a result of the training event and subsequent reinforcement. This evaluation measures the success of the training program in terms that executives and managers can understand, such as increased production, increased sales, decreased costs, improved quality, etc.

Many criticisms of the causal hierarchical mode have been made (Bates, 2004); the main ones are listed below:

Causal linkage assumption

The first criticism addresses the assumption of causal relations between the levels of evaluation. Various empirical analyses (Alliger and Janak, 1989; Alliger et al., 1997) have highlighted a lack of correlation among the measures identified at different levels of the model. Moreover, Bates (2004) notes that the causal linkage assumption may even lead to an over-reliance on reaction measures (level I), diverting trainers' attention from efforts to make training truly effective toward a focus on developing entertaining, amusing, and easygoing training that participants enjoy (Michalski, 2000).

Environment factors

The second main criticism raised against the model concerns the very narrow set of variables considered. Even assuming an increase in learning, it is clear that environmental factors such as the organization, the characteristics of the individual, the commitment of the management, etc., may either support or inhibit behavioral changes (application of learning to the job) (Holton et al., 2000; Mathieu et al., 1992). Several studies have established that environmental factors affect the linkage between level II and level III (Bates et al., 2000; Cannon-Bowers et al., 1995; Ford and Kraiger, 1995; Holton et al., 2000; Kontoghiorghes, 2001; Salas and Cannon-Bowers,

2001), showing that environmental factors can affect the transformation of learning into new behaviors.

Focus on higher levels

Assuming that level IV is the most important and that affecting results is the aim of every training activity can be wrong for many reasons (Bates, 2004). First, most training efforts have little ability to directly affect a company's results. Many training activities are of short or modest duration (2–3 days) and are meant to have only a limited effect on the participants. Second, the lack of impact on level IV could be due to the ineffectiveness of the training, as well as due to having poorly designed the training activity for the results that are sought. In other words, a perfect training program delivered to the wrong participants will lead to poor results (e.g., if participants are trained on practices not included in their roles), and focusing only on the economic measure would not allow the discovery of ways to improve the effectiveness of the training.

Economic Estimation

Finally, many researchers note the need to estimate the economic impact of training activities (Geber, 1995; Wang, 2003). However, the usage of models based on indicators such as return on investment is limited, mainly because it is difficult to give a quantitative estimation of the costs and benefits of training activities (Alliger and Janak, 1989; McLean, 2005; McLinden, 2008). Starting from the work of Phillips (2003), Alam et al. (2008) propose a model based on five different levels, adding return on investment as level five. However, many authors argue that it is not possible to make measurements that enable ROI to be evaluated with respect to intangible benefits (Rowe, 1994).

2. The case of a training program on project management

This paper is focused on assessing the impact of the Project Management Program (PMP), a 4-year training program on project management designed and delivered within the Finmeccanica group. The research process is inspired by the similar collaboration case among the University of Manchester (UoM), Rolls-Royce, AMEC, Goodrich and EDS (Alam et al., 2008).

Founded in 1948 to manage state participation in the mechanical and shipbuilding industries, today, Finmeccanica is Italy's leading manufacturer in the high-technology sector and ranks among the top ten global players in the aerospace, defense and security industries. The group has more than 70,000 employees in approximately 400 locations in 30 countries and includes industries such as those involving helicopters, defense and security electronics, aeronautics,

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