



Review

The effect of training on productivity: The transfer of on-the-job training from the perspective of economics

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ABSTRACT

Although the transfer of on-the-job training to the workplace belongs to the realm of educational research, it is also highly related to labour economics. In the economic literature, the transfer of training is based on the theoretical framework of human capital theory and has been extensively analysed empirically in econometric studies that take account of unobserved heterogeneity of workers and the selectivity in training participation. The aim of this paper is to give an overview of the underlying theoretical paradigm in economics, and the challenges faced in empirical research. The economic literature finds that participation in training is beneficial for both the participating workers and their employers, although there is also evidence that selectivity of workers matters. Despite this progress in the economic literature, the underlying processes through which training leads to a higher productivity remain unclear. We argue that this 'black box' offers opportunities for multi-disciplinary research projects on the transfer of training that relate the perspectives of educational and economic research.

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Contents

1. Introduction	29
2. Economic theory on the decision to participate in training and the returns to training	29
3. Empirical research on the returns to training	30
3.1. Challenges in measuring the returns to training	30
3.2. Workers' wages	31
3.3. Firm productivity	32
3.4. Direct measures of productivity	32
4. Inside the black box	33
4.1. Do training effects on productivity reflect learning?	33
4.2. The role of informal learning in the effects of training	34
5. Conclusions and discussion	35
References	36

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1. Introduction

Research on the transfer of on-the-job training to the workplace has been subject to educational research, but is also highly related to labour economics. In the economic literature, the transfer of training is based on the theoretical framework of human capital theory and has been extensively analysed empirically in econometric studies that take account of unobserved heterogeneity of workers and selectivity in training participation. By focusing on the returns to training in terms of the productivity increase after the training, the economic literature is actually highly complementary to the research focus of the educational literature on the transfer of training to the workplace. In the context of the classification of Kirkpatrick (1994), the studies in the economic literature particularly refer to level 4, i.e. to what extent training matters for firm results. The economic literature shows that the returns to training on this level are better measured by individual productivity measures than by overall firm level results which may also be affected by other factors (see Wang, Dou, & Li, 2002).

This paper aims at answering two questions

- How does economic literature deal with the transfer of training to the workplace?
- What is the scope for multi-disciplinary research projects on the transfer of training that relate the perspectives of educational research and economics?

For this purpose, we review the economic literature with the aim of providing an overview of the state-of-the-art in the economic literature on the returns to training instead of a review of the extensive literature on the estimation of the returns to training. In this overview, we will show the challenges related to the estimation of returns to training as well as the potential contribution of the economic literature to the studies on the ‘transfer of training’ in the educational literature. By focusing on the returns to training as measured by a worker's higher productivity after the training, the economic literature leaves a black box on the underlying processes through which the training improves a worker's productivity in the workplace. This black box actually refers to the research field of educational research. The purpose of this paper is therefore not to review transfer studies in the educational literature, but rather to outline and describe challenges and findings on the effects of training in the economic literature and thereby signalling the opportunities for interdisciplinary research.

There are three important aspects in which the economic literature on the returns to training has made substantial contributions. First, these studies use various measures of the effects of training, ranging from wages as a proxy for individual productivity to establishment level measures of productivity (i.e. the value added to be contributed to workers' performance in the job). Second, crucial to the analysis of the returns to training is how selection into training is controlled for. Third, a number of studies have attempted to look into the ‘black box’ of the ways in which training affects actual performance.

We focus on studies on the effects of workplace training, usually labelled as “on-the-job training”. Because an integral part of this type of analysis involves measurement issues, we discuss challenges in the estimation of the “returns to training”. Most studies on the returns to training conceptualise training by using survey information on workers' participation in training. While this allows estimating average effects of training (i.e. across different types of training and across different types of workers' tasks), this does not allow using detailed information on contents or types of training. For this reason, a few studies have analysed particular training programmes in econometric case studies that allow to go more into detail of how training affects productivity. At the same time, these studies are also more linked to studies in the educational literature as they evaluate particular training programmes and aim at looking into the ‘black box’ of the transfer of training to the workplace.

This article is structured as follows. In the next section of this article, we shortly present the theoretical ‘human capital’ model that is used as a theoretical framework for almost exclusively all empirical studies on the returns to training. In Section 3, we provide an overview across the main empirical contributions in economic literature. Section 4 discusses studies from the economic literature on the black box of how training affects performance. Section 5 summarises and concludes.

2. Economic theory on the decision to participate in training and the returns to training

The human-capital theory offers the theoretical framework in which labour economists started to study the impact of education and training on workers' performance in the labour market. Human capital theory was launched by a supplement volume of the *Journal of Political Economy* on ‘Investments in Human Beings’ in 1962 (e.g. Becker, 1962). The original human capital theory framework is a straightforward economic model of investments (and therefore expected costs) on the one hand, and expected returns on the other hand. Depending on the type of training, the investment consists of direct training costs (e.g. costs for learning material, coaches) and indirect training costs which arise from opportunity costs, i.e. the costs that arise because the training participant could have worked instead of following the training course. Though these costs and benefits do usually comprise monetary components (wages, increased performance, etc.), they could also consist of ‘non-economic’ components such as increases in motivation. Building on this general cost-benefit analysis that characterises the economic discipline, human capital theory states that a worker will only be trained when the discounted benefits after the training are expected to exceed the training costs. Though the original work implicitly assumes that participation leads to an increase in skills (human capital) and thus makes the worker more productive, positive returns to training could also be explained by other factors, such as higher motivation or stronger loyalty that workers may show after their employer has

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