

# E-Learning: A Way to Solve the Human Capital Bootstrapping Problem in Transitional Economies in Central Europe?

Michal Kejak and Andreas Ortmann

CERGE-EI

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The problem of "human capital mismatch" in Central European transition economies, i.e., the fact that the composition of the human capital stock inherited from socialism is not well matched with the requirements of a modern market economy, is well-documented (e.g., Campos & Coricelli 2002, especially section 2.4) We know of no model that addresses the question of how exactly the problem of human capital mismatch can be overcome. Specifically, we know of no model that addresses the important bootstrapping problem that transition economies face by their very nature: In order to overcome the skills mismatch, new skills have to be taught by someone. However, teachers who are qualified to do the job typically do not exist locally. Hence, local teachers first have to learn the requisite skills before they can teach them. Intuitively, bootstrapping (because it takes time to

build superior knowledge) makes it very unlikely that transition economies can catch up with the frontier of knowledge.

It is here where e-learning, through its universal and quick accessibility -- an important issue in particular in postsecondary and continuing education -- as well as potential cost savings in time and direct travel costs, promises to come to the rescue.

Its basic function and scope in the current context is well illustrated by the recent announcement (Businesswire, June 20, 2002) of Czech Telecom -- the principal provider of the Czech Republic's telecommunications services -- that it would use US-based Click2learn's learning management system to allow its 15,000 employees to train online. The announcement claims that, in addition to providing quick response to its employees' training needs, 60% cost savings compared to standard classroom training (with these savings being overwhelmingly savings in time and direct travel costs).

Within a general equilibrium model of endogenous growth in which human capital investment is the engine of growth we analyze the potential role of e-learning in the elimination of the human capital bootstrapping problem so typical for

transition economies. We find that e-learning can indeed speed up convergence to the frontier of knowledge. The intuitive idea behind this result is the ability of a transition economy to access external knowledge sources that do not require local teachers to first learn the requisite skills before they can teach them. Our results are derived in an economy with two education sectors -- traditional public classroom education and private e-learning. We show that there are multiple equilibria: 'bad' or 'passive parents' equilibrium, 'good' or 'active parents' equilibrium, and corner 'zero e-learning trap'; and as a consequence there are typically two transitions: 'catch-up transition' along good equilibria to balanced growth path equilibrium with sustained growth, and 'stagnation transition' along bad equilibria to autarchic zero e-learning equilibrium. Our analysis also suggests the importance of government policies for the growth prospects of the economy.