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Promoting Human Capital and Innovation in Low Income Countries (LICs)

Policy brief DFID/Tilburg University research: *Co-ordinated Country Case Studies - Innovation and Growth, Raising Productivity in Low Income Countries* <http://www.tilburguniversity.edu/dfid-innovation-and-growth/>

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Human capital and innovation

In policy making, business practice and academic research, there has been much interest in the factors promoting innovation, particularly research and development (R&D), technology acquisition and the external institutional context. Only a few studies have focused on the role of internal **human capital**, or the skills, abilities and knowledge of the employees, as an important source for innovation within firms. These studies analysed human capital at a macro level, showing a positive relationship between human capital and innovation. However, they offer little insight into the relationship between human capital and innovation at the **firm level**, particularly in Low Income Countries (LICs). This is especially important because most innovation within manufacturing SMEs in LICs occurs incrementally via learning by doing, for which human capital at the firm level is critical.

In a research article entitled '*Human capital and innovation in developing countries: a firm level study*' Van Uden and co-authors¹ analysed the relationship between firms' human capital endowments and firm-level practices to improve innovative output. This was analysed using **employee schooling level** as the human capital endowment and **firm-level (company) training** as a firm-level practice. Moreover, the study considered free time within working time ('**slack time**') that employees can spend on their own innovative ideas as an additional firm-level practice. They referred to evidence from company 3M, where employees spend 15% of their working time on projects of their own choosing, and conclude that such employees have a higher chance of becoming innovative.

There is an implicit assumption that if different factors spur innovation, combining these factors will result in a strong impact. Therefore, different combinations of firm-level practices with regard to training and slack time were related to innovation, which was defined as the introduction of new or significantly improved products or services by the firm. The data collected (survey) concerned a sample of SMEs in Kenya, Tanzania and Uganda (2,076 SMEs in total).

This policy brief presents the research outcomes and discusses several policy implications that could be considered by governments, business managers and development agencies.

¹ The original scientific article, produced in 2014 by Annelies van Uden, Joris Knobens and Patrick Vermeulen of Radboud University Nijmegen (RUN), is available at: <http://www.tilburguniversity.edu/dfid-innovation-and-growth/>

Research findings

Employee schooling as a factor

A higher level of schooling enhances employees' ability to understand, create and process information more quickly within the firm than individuals without education. This is conducive to innovation, since it is a knowledge-based activity. The research showed a **marginally significant** effect of employee schooling level within firms on the likelihood of being innovative. Employee schooling is a relatively unimportant factor for innovation within SMEs in Kenya, Tanzania and Uganda.



Formal company training as a factor

Formal company training refers to the extra training that employees receive from the firm and provides employees with specific knowledge, because many skills are not learned during general basic education. The research demonstrates a **strong relationship** between formal company training and the probability of producing innovative output compared to firms that do not provide formal training. Having a company training programme more than doubles the likelihood of a firm being innovative, from 23% to 47%.

Employee slack time as a factor

Slack time gives employees the resources to work on their own ideas and encourages creativity to transform the available and general technological knowledge stock. The research found that a firm that gives slack time to its employees has a **higher probability** of producing innovative output compared to firms that do not give slack time to their employees. The size of this effect is even more pronounced than that of formal training: offering employees slack time results in an increase in the likelihood of being innovative from 23% to 54%.

Interaction effects

The research found that employee slack time in combination with the amount of employee schooling within a firm **does not strengthen** the other factor's effect on the probability of producing innovative output in the manufacturing industry. However, any level of employee schooling or offering employee slack time will increase a firm's likelihood of being innovative. For firms that already offer employee slack, a strategy of hiring more educated employees might have negative consequences for innovativeness. It was assumed that offering both formal training and employee slack time would be counterproductive, as formal training might reduce individual creativity, on which employee slack relies.

Policy implications

Van Uden and co-authors show that the internal human capacity of the SMEs surveyed in Kenya, Tanzania and Uganda has a significant impact on the innovative output. In fact, the study shows that the internal practices for stimulating knowledge development and creativity for innovative ideas, such as formal company training and providing slack time, have a more profound relationship with innovation than traditional factors such as formal education and formal R&D.

'...We find that human capital, and especially firm level practices to improve human capital, plays an important role for innovation in developing countries. Overall our results point into the direction that firm level practices, even more than the human capital endowments, seem to be pivotal for innovation...' (Van Uden et al. (2014))

The importance of the internal practices revealed in the study appears to be somewhat at odds with current innovation policy thinking, which is based on an innovation systems approach focusing on technology development through setting up networks of formal R&D and educational institutions around the firm. In fact, the small incremental product and process innovations and adaptation of existing technology observed in the SMEs were not the result of innovation system institutions; rather from internal learning by doing, using and interacting. This study suggests that SMEs equally (or perhaps more) benefit from policies that strengthen their internal human capacity, rather than from policies promoting surrounding R&D institutions. This implicitly leaves the initiative and 'ownership' of the innovation process (technology development) much more within the SME².

It is essential to acknowledge the value of human capacity and an awareness among managers and employees that innovation emerges and blossoms from within the firm; new ideas and technology are not brought to SMEs by governments. In line with this idea, the article suggest two policy implications that policy makers within government, businesses or development agencies could take into account, related to human capital development within manufacturing SMEs in LICs.

Support formal company training

Formal company training can be either general training that upgrades the capabilities of the whole workforce or specific training that improves specific knowledge or skills. Promoting the creativeness and innovative output of employees can be a learning objective of both forms of company training.

Government agencies could develop special policies and programmes that encourage and support SMEs in providing formal company training. This could take the form of awareness raising programmes explaining the particular benefit of company training for innovative output by employees. Government or development agency policies and programmes could assist in the development of formats and curriculum for such in-company training programmes. Governments could introduce certain tax advantages, subsidies or other incentives for supporting company training. Such tax advantages could be linked to innovative output.

² Ownership and risk by the entrepreneurs themselves are acknowledged to be essential in creating healthy, innovative and expanding enterprises. Moreover, SMEs investing and owning new technology of other types of innovation are likely to also own the 'fruits' of the innovation. This will be beneficial for SMEs that operate poor and informal contexts.

With regard to SMEs' managers and branch organisations, their internal/company policies could focus on conducting formal training linked to the creativeness and innovative output of employees. This training could reflect and encourage a proactive and creative attitude and the freedom to develop ideas on the shop floor.

Promoting slack time



The research revealed that promoting slack time could be a way to increase innovative output in SMEs. To do so, a government might inform the business community of how slack time could contribute to innovative ideas and output from employees, encouraging them to establish a culture which includes slack time as routine and a way to promote innovation. An implication is that organisational/cultural change is necessary within firms.

Instead of passive employees working in a formal top-down management structure, a changed mentality enables employees to take ownership and initiative. Management could encourage creative thinking by their employees to stimulate innovation. Within business, managers can initiate a change of attitude and organisational culture from top-down towards allowing some freedom and ownership in the innovation process and technology development; allowing failures and rewarding innovative output; drawing on employee creativity and establishing internal procedures to encourage innovation.

More indirectly, innovation policy could address state provision of primary and secondary education. Instead of a focus on technical training and science and mathematics, there could be an additional priority to develop pupils and students to be creative, work in teams, and to take the initiative proactively once slack time is allowed.

This policy brief is the product of a research project funded by the British Department for International Development (DFID) entitled '*Coordinated Case Studies – Innovation for Productivity Growth in Low Income Countries*'. The project is implemented by Tilburg University (The Netherlands) and explores SME-level innovation in Low Income Countries (LICs) and factors that contribute to or limit its diffusion. Data collection and research collaborations take place in 10 African and Asian countries (Bangladesh, Ethiopia, Ghana, India, Indonesia, Kenya, Tanzania, South Africa, Uganda and Vietnam). The policy implications of research are presented in a series of policy briefs, targeted at a broad audience of policy makers within governments, business and development agencies with a view to quantifying research outcomes and promoting evidence-based policy making.