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Author: Dr. Danielle Wood  
The John Hopkins University, United States

Dr. Annalisa Weigel  
Massachusetts Institute of Technology (MIT), United States

TECHNOLOGY TRANSFER AS A MEANS FOR CAPABILITY BUILDING IN DEVELOPING  
COUNTRY SPACE PROGRAMS

**Abstract**

Technology transfer of space technology between organizations can lead to many benefits. One area of benefit is the opportunity for organizations with limited space experience to increase competence in space technology. Some countries use collaboration with foreign partnerships to develop such competence. These episodes of technology transfer can provide mutual benefit. The supplier benefits as they access business in a new market area. The customer benefits as they access both new services and knowledge. This paper presents examples of several countries that are using technology transfer as part of a broader process of establishing a local satellite program. The paper presents original frameworks that define the capabilities required to participate in satellite engineering. The capabilities are described in terms of the topics, level of codification and level of application. In order to master the knowledge base underlying satellite engineering, both individuals and organizations must capture a broad knowledge base which includes both tacit and explicit knowledge about technical and managerial topics. The framework also defines capability building as a process. Capability building is achieved when individuals or organizations experience new topics or they achieve new levels of application, complexity or autonomy. This capability building framework is applied to in-depth analysis of four countries in Africa and Asia. The detailed analysis of four countries shows learning at the individual and organizational level over the short and long term. This is put in the context of the experiences of other countries around the world. Data for the case studies was collected via long term field work and analyzed using qualitative and analytical approaches. The results show that in the short term individuals grew in their levels of autonomy via technology transfer partnerships. A key question to consider is how countries adapt, master and diffuse technology over the long term. Several countries stand out for their effort in this area, but this is a core long term challenge. It requires sound local infrastructure and the ability to interface effectively between government and private sector actors such as universities and firms.