A model of knowledge transfer and integration at the science-policy interface

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Abstract

Adaptive policy making will require more integration of knowledge from different sources (i.e., transdisciplinarity) as well as long-term communication between scientists and policy makers. Many policy measures have been taken and new ones are being implemented to facilitate transdisciplinary approaches to knowledge creation, which is a relatively new, but increasingly widespread, practice in the scientific community. For example, funding agencies for scientific research are commonly consulting with scientists to define research goals for future calls for proposals. Furthermore, there are a number of initiatives at the EU level to promote networking of scientists from different disciplines and countries, but also the involvement of private enterprise and a wide variety of stakeholders. Even though these science-policy initiatives certainly underwent a policy appraisal process, the fundamental mechanisms that are meant to lead to more effective knowledge transfer at the science-policy interface have not been explored fully. The objective of this work is to show how some simple changes in the parameters given to scientists when policy evaluations/policy-related research are completed can change the quality and relevance of the outcome of the project. An agent-based model was created in the open-source software NetLogo using some modeling ideas from SKIN (Simulating Knowledge Dynamics in Innovation Networks). The baseline assumption was that scientists deliver random quality and relevance of answers in their respective discipline and that the overall quality and relevance of the knowledge created was reflected in the sum of what scientists delivered. According to probabilistic principles the emergent distribution of quality and relevance of answers is centered on, and peaks at mediocre quality and relevance of answers in this baseline scenario. Scenarios of increasing facilitation of communication among experts and stakeholders were run to show the effects of increased dialogue, expert selection, networking as well as additional data collection on the outcome. While this model is highly artificial and a great simplification of joined knowledge creation at the science-policy interface, some interesting insights as how the parameters given to scientists for the delivery of their advice can influence outcomes for policy makers emerged. The model results highlight which mechanisms of consultation may prove the most beneficial for creating truly transdisciplinary knowledge of high scientific quality and policy relevance for evidence-based policy making. Furthermore, the model can depict how long-term communication between scientists and policy makers allows policy makers to adopt an adaptive approach, thus increasing the effectiveness of policy making over time. Knowledge creation systems that facilitate such learning over time will greatly enhance resilience by providing a better evidence base that can support restorative intervention when needed.

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