NOTE: If you decide to have any of these publications translated in full, please send a copy to us so we may add it to the page.

Considering the global interest in policy and practice issues regarding Science, Technology and Innovation, we provide brief summaries of selected publications in multiple languages. If the summary is interesting, the reader may wish to translate the entire publication.

STI Policy Analysis - We examine linkages between Science Discovery, Engineering Technology & Market Innovation in both policy and practice, for the purpose of improving the beneficial socio-economic impacts from the investment of public resources.

- Most governmental organizations address socio-economic problems by funding universities to conduct R&D projects, instead of funding companies to do so. This paper explains why this indirect approach generates countless scholarly papers but results in few tangible solutions. *Bridging the persistent gap between R&D and Application (Lane, 2015).*

  Lane, J (2015). Bridging the persistent gap between R&D and application: A historical review of government efforts in the field of Assistive Technology. Assistive Technology Outcomes and Benefits, 9, 1, pp. 1 – 19.

- A book chapter explains why the inability of international policy bodies to clearly distinguish scientific research from engineering development hampers progress towards more efficient and effective STI policies and practices – *Making and remaking the measurement of science and technology: The international dimension (2014).*

  B. Godin and J. Lane (2014), Making and Remaking the Measurement of Science and Technology: the International Dimension, In Maximilien Mayer, Mariana Carpes and Ruth Knoblich (eds.), *The Global Politics of Science and Technology (II): Perspectives, Cases and Methods*, 163-177. Springer-Verlag Berlin Heidelberg.

- Scholarly debates over false dichotomies distracts from the fact that multiple forces influence technological innovation that all must align to benefit society – *Push and Pull: History of the demand pull model of innovation (2013)*.

  Godin, B, Lane, JP. Pushes and Pulls: Hi(S)tory of the Demand Pull Model of Innovation, *Science, Technology, & Human Values*, August 5, 2013 (print publication date). http://sth.sagepub.lcom/content/38/5/621.

- It is more important to explore the causal links between inputs and outcomes than to accept entrenched assumptions regarding their relationships. *Methodology trumps mythology (2012)*.

  Lane,JP, Godin, B. Methodology Trumps Mythology, *Bridges*, *The Translatlantic STI Policy Quarterly from the Office of Science & Technology, Embassy of Austria, Washington, DC,* 36, December 2012/OpEds & Commentaries.

- STI Policies in most nations neglect the critical role of the business, industry and the commercial marketplace, which leaves their global competitive status vulnerable to the one nation that is not neglecting those factors; China. *Is America's Science, Technology & Innovation Policy Open for Business? (2012).*

  Lane, JP, Godin, B, Is America's Science, Technology, and Innovation Policy Open for Business? Science Progress, June 12, 2012, http://scienceprogress.org/2012/06/is-america%E2%80%99s-science-technology-and-innovation-policy-open-for-business/

- Argues that the United States would benefit from embracing abandoned past policies which were adopted successfully by a series of nations over the past fifty years. *Déjà Vu Policy: Importing U.S. innovation policies from abroad (2012)*.

  Arnold, GJ, Lane, JP, Déjà Vu Policy: Importing U.S. Innovation Policies from Abroad, *Journal of Science Policy & Governance,* 2012, **2**(1):1-21.

- Explains how the dominant paradigm of scientific research in technological innovation drove out serious consideration of the equally critical methods of engineering development and industrial production. *A Century of talks on research: What happened to development and production? (2012).*

  Godin, B, Lane, JP, A century of talks on research: what happened to development and production?, *International Journal of Transitions and Innovation Systems,* 2012, 2(1): 5-13.

- Argues that debates over primacy of research or development are a false dichotomy diverting attention from a more fundamental understanding of the elements underlying innovation. *Research or Development? (2011).*

  Godin, B, Lane, JP, Forschung oder Entwicklung?, *Gegenworte*, 2011, 26 (Fall 2011), 44-47. English Translation

It is not widely recognized that new knowledge is generated by three distinct methodologies, because their knowledge outputs are embodied in different states.

- The paper explains the relationship between three states of knowledge generated through three related methodologies, and also describes the three processes through which knowledge moves between states and stakeholders. *Managing knowledge in three states of conceptual discovery, prototype invention & commercial innovation (2013)*.

  Lane, J. & Lane, R. "Managing Knowledge in the Three States of Conceptual Discovery, Prototype Invention & Commercial Innovation", KMIS 2013, Vilamoura, Algarve, Portugal, September 19-22, 2013

- The three methodologies of scientific research, engineering development and industrial production are each intentionally designed to generate new knowledge, but their knowledge outputs are embodied in three different states analogous to states of matter: conceptual discovery (gas), prototype invention

(liquid) and commercial innovation (solid), respectively. *Translating three states of knowledge: discovery, invention and innovation (2010).*

Lane, JP and Flagg, JL, Translating three states of knowledge--discovery, invention, and innovation, *Implementation Science 2010*, **5**:9.

- A three hour MSPowerpoint seminar traces the history of knowledge states from Aristotle to the present and explains how and why modern constructs and definitions became conflated and confused. *Three methods and three states of knowledge underlying technological innovation (2014).*

Lane, J. "Three Methods & Three States of Knowledge underlying Technological Innovation." Seminar at the CTI Renato Archer, Campinas, Brazil.

The Technological Innovation Process – We explain the important relationships between Scientific Research, Engineering Development and Industrial Production in the context of new product development.

- The Need to Knowledge (NtK) model explains technology-based product development by linking the methods of scientific research, engineering development and industrial production through nine activity stages and decision gates, along with supporting evidence drawn from academic and industry sources. *Need to Knowledge (NtK) Model: an evidence-based framework for generating technological innovations with socio-economic impacts (2013).*

Flagg, JL, Lane, JP, Lockett MM. Need to Knowledge (NtK) Model: an evidence-based framework for generating technological innovations with socio-economic impacts, *Implementation Science* 2013, **8**:21.

- Building a logic model structure permits one to state a desired goal, then arrive at a plan to achieve the goal by working backwards through impact, outcome, output, process and input. The completed plan can then be implemented forward to achieve that goal, as shown in this detailed example for a technology innovation. *Modeling technology innovation: How science, engineering and industry methods can combine to generate beneficial socio-economic impacts (2012).*

Stone, VI, Lane, JP, Modeling technology innovation: How science, engineering, and industry methods can combine to generate beneficial socioeconomic impacts,*Implementation Science*, 2012, **7**:44

- A two-part Webcast explains the Need to Knowledge Model in detail, and describes the supporting evidence drawn from existing literature. The presentations contain case examples, valuable citations, useful tips, and analytic tools critical to the new products development process. *Steps and supporting evidence to support your process (2010); The researcher's resource for innovation – now including tools (2012)*.

The KT4TT Knowledge Base: Steps and Supporting Evidence to Improve Your Process! (September 29, 2010), presented by Jennifer Flagg
The KT4TT Knowledge Base: The researcher's resource for innovation— Now including tools! (August 22, 2012), presented by Michelle Lockett

- The analyses of data collected on four types of requirements - technical, marketing, business or customer – are necessary, complex, and often repeated within a single new product development project. This paper describes many of the tools available to perform these analyses, and explains where they are useful within the Need to Knowledge Model. *Tools for Research, Development and Production (2015)*.

Flagg, JL, Lockett, MM, Condron, J & Lane, JP (2015). Tools for Analysis in Assistive Technology Research, Development and Production. *Assistive Technology Outcomes and Benefits*, 9, 1, pp. 20 – 38.

Technological innovation within the field of Disability and Rehabilitation needs to expand beyond university-based programs.

- A generic model for technology-based product development is placed into the context of a niche market called Assistive Technology – *The Need to Knowledge Model: An operational framework for knowledge translation and technology transfer (2012)*.

Lane, JP, The "Need to Knowledge" Model: An operational framework for knowledge translation and technology transfer, *Technology and Disability*, 2012, **24**,187–192.

- A panel of experts explains that improving the lives of people with disabilities requires enhanced funding to consumers, clinicians and companies, and that such funding must be based on establishing more precise and appropriate standards and guidelines for use by government reimbursement agencies. *Standards for Assistive Technology Funding (2015)*.

Clayback, D, Hostak, R, Leahy, JA, Minkel, J, Piper, M, Smith, RO, Vaarwerk, T. (2015). Standards for assistive technology funding: What are the right criteria? *Assistive Technology Outcomes and Benefits*, 9, 1, pp. 39 – 54.

- This MSPowerpoint conference presentation opens the black box of innovation to show industry's critical role in transforming scholarly research outputs into beneficial social impacts. *Where do market innovations come from? Not the stork! (2014)*.

Lane, J. "Where do Market Innovations come from? Not the Stork!" ATIA 2014, Orlando, FL - January 29-February 1, 2014

- Five related articles cover different aspects of new product development, commercialization and outcome measurement in the context of Assistive Technology – *State of the Science in Technology Transfer: At the confluence of academic research and business development (2010).*

Focused Issue: State of the Science for Technology Transfer, *Assistive Technology Outcomes and Benefits*, Summer 2010, **6**(1).
Bodine, C, Bauer, S, Parette, Jr., HP, State Of The Science On Technology Transfer

- Descriptions and examples of critical events, activities, and stakeholders involved in the technology transfer process, as an overview of effective practices – *Technology transfer and technology transfer intermediaries (2010).*

Bauer, SM, Flagg, JL. Technology Transfer And Technology Transfer Intermediaries*, Assistive Technology Outcomes and Benefits*, Summer 2010, **6**(1).Summer 2010

- A longitudinal retrospective study of a dozen prestigious university-based R&D centers reveals that most projects fail to achieve the intended outcomes due to insufficient planning, management and collaboration with critical external partners. *Delivering on the D in R&D: Recommendations for increasing transfer outcomes from development projects (2008).*

Lane, JP Delivering the "D" in R&D: Recommendations for Increasing Transfer Outcomes from Development Projects, *Assistive Technology Outcomes and Benefits*, Fall 2008 Special Issue.

The critical factor for effectively communicating new knowledge is relevance to target audience; not study rigor or scholarly status.

- Three randomized controlled studies compared the effectiveness of passive diffusion, targeted dissemination and tailored translation in increasing knowledge use by various stakeholders. A key result showed that relevance to the recipient -- not format or media -- determines the level of interest and use. *Effectively communicating knowledge to AT stakeholders (2015).*

Stone, VI, Lane, JP, Tomita, MR, Flagg, JL, Leahy, JA, Lockett, MM, Oddo, C, Usiak, DJ, (2015). Effectively communicating knowledge to Assistive Technology Stakeholders: Three randomized controlled case studies. *Assistive Technology Outcomes and Benefits*, 9, 1, pp. 99 – 161.

- Documenting evidence of use of new knowledge by various stakeholder groups required the creation and validation of a valid instrument capable of assessing changes across the four knowledge levels of non-awareness, awareness, interest and use. *Development of a measure of knowledge use by stakeholders in rehabilitation (2014).*

Stone, V.I., Nobrega, A.R., Lane, J.P., Tomita, M.R., Usiak, D.J., Lockett, M.M.,Development of a measure of knowledge use by stakeholders in rehabilitation technology, *Sage Open Medicine*, 2014, **2,** 1-19.

- An MS Powerpoint workshop about communicating the results of R&D projects to external stakeholders who contribute to transforming R&D outputs into

commercial innovations – *Technology transfer for knowledge translation practitioners (2014)*.

Flagg, J. "Technology Transfer for Knowledge Translation Practitioners" Knowledge Translation Professional Certificate Course Invited Faculty: Sick Kids Learning Institute, Toronto Ontario, February 26, 2014.

- This study confirms and extends prior findings about the receptivity of national organizations to interacting with experts in related fields, and their willingness and capacity to communicate information from research studies to multiple non-traditional audiences. *Assessing the roles of national organizations (2015).*

Nobrega, AR, Lane, J, Flagg, JL, Stone, VI, Lockett, MM, Oddo, C, Leahy, JA, Usiak, DJ (2015). Assessing the roles of national organizations in research-based knowledge creation, engagement and translation: Comparative results across three Assistive Technology application areas. *Assistive Technology Outcomes and Benefits*, 9, 1, pp. 55 – 98.

- Repeated survey studies show that national-level professional organizations offer an efficient and effective path through which investigators can share, translate and disseminate new findings to non-traditional audiences – *Engaging for knowledge translation: Comparative case studies in knowledge value mapping (2011).*

Lane, JP, Rogers, JD, Engaging national organizations for knowledge translation: comparative case studies in knowledge value mapping, *Implementation Science* 2011, **6**:106.

- Conducting industry-standard focus groups early in the product design process ensures the resulting products are relevant to the needs and interests of the actual customers. -- *Targeted Consumer Involvement: An Integral Part of Successful New Product Development (2013).*

Leahy, J. Targeted Consumer Involvement: An Integral Part of Successful New Product Development, Electronic version of this article published in Research-Technology Management (RTM), Vol. 56, No 4 (2013), pp. 52-58. Available online www.iriweb.org/rtm