i2S News

March/April 2021, #55

Australian National University

INTRODUCTION

Welcome to the March/April i2S News! This is our bi-monthly notification of new additions to the resources on the i2S website (https://i2s.anu.edu.au/resources). It also provides a list of the latest blog posts on the Integration and Implementation Insights (i2Insights) blog (http://i2insights.org).

We also have some i2Insights blog news to report:

- In February we doubled the number of blog posts published and set new records for views (nearly 24K) and viewers (15.5K).
- Our most popular blog post has topped 100K lifetime views! It is A guide to ontology, epistemology and philosophical perspectives for interdisciplinary researchers by Katie Moon and Deborah Blackman.

Finally, it has come to our attention that some people think that an invitation is necessary before they can contribute a blog post or comment to i2Insights blog. That's not the case! Do get in touch if you have something to say. You might also find it helpful to review the "guidelines for authors" and the new "guidelines for commenters."

Stay well,
Gabriele and Peter

CONTENTS

FEATURED TOOLS

Change: diffusion of innovations

Purpose: To provide insights into how and why people adopt new ideas, practices, tools or other innovations.

Description: Everett Rogers' theory of the diffusion of innovations among individuals and organisations, first published in 1962 (5th edition published 2003), is relevant in a wide range of areas, from farming to education, and medical practice to popular culture.

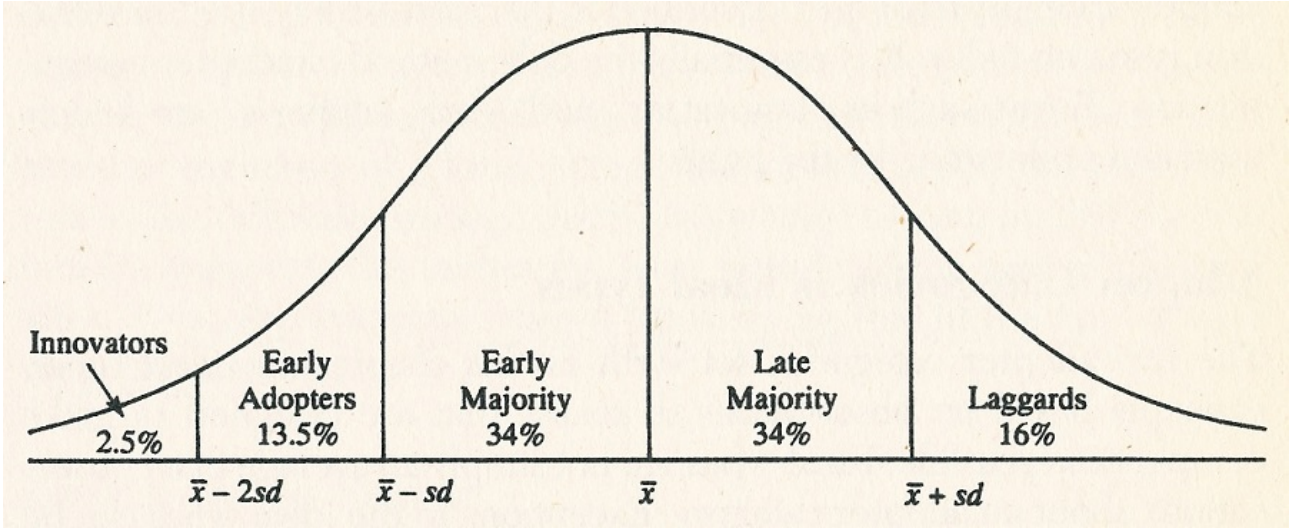
Rogers aimed to explain how and why individuals and organisations adopt new ideas, practices, tools or other innovations. Key aspects of his theory are described, focussing on:
- Five categories of adopters
- Five attributes of innovations that influence adoption
- How decisions to adopt or reject innovations are made at individual and organisational levels.

Five categories of adopters

Probably the most influential aspect of Everett Rogers' theory is his characterisation of 5 categories of adopters: innovators, early adopters, early majority, late majority, and laggards. These are useful abstractions from a more complicated reality.

1. *Innovators* are a small group of risk takers who actively seek out new ideas, practices, tools and so on, and who are keen to try something new. They become aware of innovations through their wide relationships with other innovators. They import new ideas, practices or tools into their local peer networks, although they may not be particularly respected in those networks. Their risk tolerance and financial resources mean that they are willing to fail.
2. *Early adopters* are more careful (than innovators) about the innovations they take up. Their judicious choices about which innovations to adopt maintains their position as respected members of local peer networks; members who are turned to for advice and information. Once they have picked up an innovation, therefore, they serve as role models for others in their social system, by communicating their evaluation of the innovation to their peers. This allows others to have more certainty in picking up the innovation.
3. *Early majority* are those who adopt the innovation just before the "average network member" does. They are an important source of momentum for the spread of the innovation.
4. *Late majority* tend to be sceptical about innovations and want to be sure their investment will be worthwhile.
5. *Laggards* are even more cautious and want to be sure the innovation will not fail.

Rogers provides more socioeconomic, personality and communication behaviour characteristics for each category and suggests that their distribution in the population is reasonably consistent (see figure below). Mass communication is important for spreading awareness about an innovation, but individual networks are critical for actual adoption, as potential adopters turn to peers for opinions and evaluations.



Proposed categorization of adopters based on the average time to adopt (x) and the standard deviation (sd) (Rogers, 2003, p. 281).

Five attributes of innovations that influence adoption

Rogers argued that whether and how fast an innovation is adopted depends on five attributes:

1. Relative advantage – the degree it is perceived to improve on a previous innovation
2. Compatibility – the degree it is perceived to be a) congruent with existing systems and b) consistent with the potential adopter's values, needs and experiences, which determines the extent of behaviour change (and potentially change in values) required for uptake
3. Complexity – how difficult it is to understand, learn and use
4. Trialability – whether it can be tried before committing to adoption
5. Observability – whether the results can be seen when others use the innovation; observing others can be a proxy for trialling the innovation oneself.

It is the perception of these attributes, rather than the actual attributes that is important. Similarly in terms of the innovation itself, it is the perception of newness, rather than actional novelty, that is important. Returning to the attributes, is the combination of attributes that determines adoption. In essence, ability and motivation have a large impact on a potential adopter's likelihood of taking up an innovation. Those motivated to adopt something new are also likely to make the necessary adjustments and may even re-invent the innovation for their particular circumstances.

How decisions to adopt or reject innovations are made at individual and organisational levels

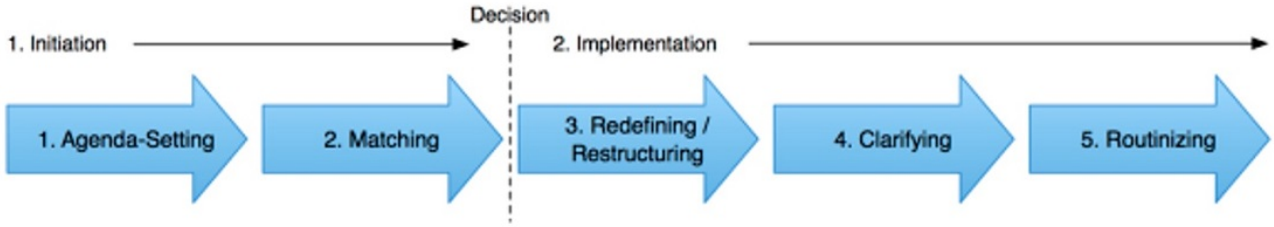
Rogers also put forward separate five step processes for individuals and organisations to explain how decisions about whether to adopt or reject innovations are made. The goal of the process is to reduce uncertainty and the steps do not need to be consecutive.

For individuals, the key steps are:

1. Knowledge: becoming aware of the innovation's existence and starting to understand how it works.
2. Persuasion: developing a view about the innovation or an attitude towards it
3. Decision: resolving to trial or adopt the innovation
4. Implementation: starting to use the innovation and therefore learning about it and overcoming problems (further reducing uncertainty). At this stage reinvention can also occur.
5. Confirmation: continuing to collect information that either reinforces the decision to use the innovation or that reverses it.

Awareness, how-to knowledge, opinions of peers and personal trials are all important. There is also the potential to reject the innovation at each stage in this process. Because there is always a cost to changing behaviour, it is common for people to know about an innovation and have a favourable attitude, without acting on it to change their practice.

At the organisational level, the innovation process is different as shown in the figure below.



The innovation process at the organisational level (Source: https://leif.me/on-the-diffusion-of-innovations-how-new-ideas-spread/; this is a simplified version of the figure in Rogers, 2003, p. 421.)

Initiation involves:

1. Agenda setting: The organisation identifies and prioritises needs and problems that could be addressed by changing how things are done.
2. Matching: Specific needs or problems are matched with innovations that could solve them.

At this point a decision about proceeding is made, which could lead to implementation, involving:

3. Redefining / restructuring: The organisation customises the innovation to suit its structure and culture, as well as the specifics of the need or problem.
4. Clarifying: As the innovation starts to diffuse through the organisation, its members get a clearer and common understanding of it.
5. Routinising: The innovation is embedded in the organisation and no longer distinctive.

Individual change is also embedded in organisational change.

References:

- Rogers, E., M. (2003). *Diffusion of innovations*. 5th edn. Free Press (Division of Simon and Schuster): New York, United States of America.
- Singer, L. (no date). *On the diffusion of innovations: How new ideas spread*. (Online): https://leif.me/on-the-diffusion-of-innovations-how-new-ideas-spread/

- For an updated and more sophisticated model, specifically applied to health service delivery and organisation see:
    - Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P. and Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *Milbank Quarterly*, **82**: 581-629. (Online) (DOI): https://doi.org/10.1111/j.0887-378X.2004.00325.x

Location of this resource on the i2S website:
https://i2s.anu.edu.au/resources/diffusion-of-innovations

Unknowns: three kinds (updated tool)

Purpose: To distinguish among three primary categories of unknowns.

Description: One useful way of thinking about different kinds of unknowns is illustrated in the matrix below, which highlights three kinds of unknowns: known unknowns, unknown knowns and unknown unknowns.

	Known	**Unknown**
Known	Known Knowns	Known unknowns (conscious ignorance)
Unknown	Unknown knowns (tacit knowledge)	Unknown unknowns (meta-ignorance)

Adaptation by Michael Smithson of Kerwin (1993), published in Bammer et al., (2008); Also described in Bammer (2013).

The most familiar is what we know we do not know *ie.*, 'known unknowns' or conscious ignorance. Most research addresses this kind of ignorance, seeking to fill known knowledge gaps.

Unknown knowns or tactic knowledge is knowledge that we are largely unaware that we have. Culturally appropriate behaviour is a good example. It is usually not until we are exposed to another culture that we become attentive to what we know about how to behave in our own culture. In particular, we become aware that we have a store of knowledge about how to be polite, what behaviours are unacceptable, gestures that are offensive and so on.

The third kind of ignorance is what we do not know we do not know, the 'unknown unknowns'. We generally become aware of unknown unknowns through surprise. There are two kinds of unknown unknowns: false convictions and unknowns we are not aware of at all (Smithson, 2019).

False convictions can be overturned by a credible source. On an individual or group basis this can be aided by interacting with people outside the usual circles, opening the potential for their knowledge to expose an unknown unknown. For example, if I 'know' there is only one kind of rice, mixing with people from an ethnic culture or occupation (*eg.*, chefs) who use various varieties of rice can expose my unknown unknown.

Unknowns that we are not aware of at all are generally exposed by hindsight, after an event, for instance, has caught us by surprise. For example, before the 1980s, the communicable disease HIV/AIDS was an unknown unknown—as a society we did not know that such a disease was developing and would strike.

References:

- Bammer, G. (2013). *Disciplining Interdisciplinarity: Integration and Implementation Sciences for Researching Complex Real-World Problems*. ANU Press: Canberra, Australia (Online: http://press.anu.edu.au/publications/disciplining-interdisciplinarity)
- Bammer G., Smithson, M. and the Goolabri Group. (2008). The Nature of Uncertainty. In Bammer, G. and Smithson, M. (eds.) *Uncertainty and Risk: Multi-Disciplinary Perspectives*. Earthscan: London, United Kingdom, pp: 289-303
- Kerwin, A. (1993). None too Solid: Medical Ignorance. *Science Communication*, **15**, 2: 166-185
- Smithson, M. (2019) *How can we know unknown unknowns?* (Online): https://i2insights.org/2019/09/10/how-can-we-know-unknown-unknowns/

Location of this resource on the i2S website:
https://i2s.anu.edu.au/resources/three-kinds-of-unknowns

Unknowns taxonomy (updated tool)

Purpose: To distinguish different kinds of unknowns.

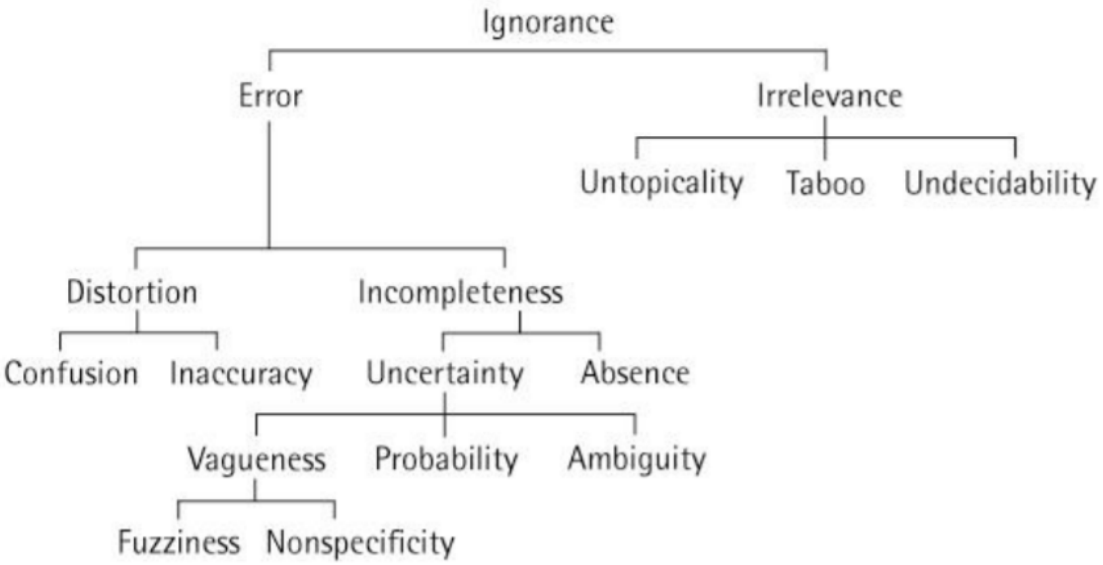
Description: It is useful to characterise different kinds of unknowns and to show their relationships in a taxonomy.

A taxonomy of unknowns is shown in the figure below (over the page). The catch-all term used in this taxonomy to encompass all kinds of unknowns is "ignorance" and the first distinction is between passive and active ignorance. Passive ignorance involves "being ignorant of", whereas active ignorance refers to "ignoring". The term 'error' is used for the unknowns encompassed by passive ignorance and 'irrelevance' for active ignorance.

Each of these terms is then further divided into other kinds of ignorance or unknowns. The key issue is that the taxonomy demonstrates that there are multiple kinds of unknowns, many, if not all, of which will be inherent in any complex societal or environmental problem.

Having differentiated passive (error) from active (irrelevance) ignorance, let us examine the types of unknowns under 'error'. Two primary sources of error are "distortion" and "incompleteness."

One type of distortion, 'confusion', involves wrongful substitution, mistaking one attribute for another. Mistaking a block of cheese for a bar of soap is an example of confusion. The other, 'inaccuracy', is distortion in degree or bias. Assuming that all swans are white is an example of inaccuracy.



Different kinds of ignorance or unknowns (Smithson, 1989, p. 6). Also described in Bammer et al. (2008) and Bammer (2013).

Moving on to 'incompleteness', it is useful to differentiate between "incompleteness in degree" or 'uncertainty', and "incompleteness in kind" or 'absence'.

'Uncertainty' refers to partial information and can be subdivided into three categories:

1. vagueness, which relates to a range of possible values on a continuum
2. probability, which refers to the laws of chance
3. ambiguity, which refers to a finite number of distinct possibilities.

Vagueness can then be subdivided into 'fuzziness' and 'non-specificity'. Fuzziness refers to fine-grade distinctions and blurry boundaries. For example, an object may be dark, but there is no clear boundary where darkness begins and ends. Non-specificity is another kind of vagueness. An example relates to geographical location. To say that someone lives near a school does not give any indication of whether they are a 5-minute walk away or a 5-minute drive away.

Moving on to probability, the classic example refers to numerous tosses of a fair coin and the likely outcome that half of the tosses will land heads and half tails. Much statistics involves tackling problems which combine vagueness and probability. While probability does not help us with the vague statements provided as illustrations in the previous paragraph, it can assist with other vague statements, such as 'this ticket may win money in the lottery' or 'today some drivers will be injured in an accident'. Probability then helps us calculate the chance of winning or being injured.

Ambiguity is best demonstrated though a linguistic example. To say that food is hot does not clearly tell us if this refers to temperature or spiciness.

The final item in the 'error' side of the taxonomy is "absence". Absence is simply gaps in knowledge, which can be known or unknown gaps. This is where the matrix of three kinds of unknowns fits.

The 'irrelevance' arm of the taxonomy refers to issues that are deliberately or unconsciously overlooked. It is useful to identify three subcategories:

1. 'untopicality', where, in the consideration of any particular issue, some things will be generally agreed to be off topic. In defence policy decisions, for example, the price of children's toys would generally not be considered topical.
2. 'taboo,' which refers to matters people must not know or even enquire about. This is socially enforced irrelevance.
3. 'undecidability,' which happens when a matter cannot be designated true or false or when deciding on truth/falsity is not pertinent.

References:

- Bammer, G. (2013). *Disciplining Interdisciplinarity: Integration and Implementation Sciences for Researching Complex Real-World Problems*. ANU Press: Canberra, Australia. (Online): http://press.anu.edu.au/publications/disciplining-interdisciplinarity
- Bammer G., Smithson, M. and the Goolabri Group. (2008). The Nature of Uncertainty. In Bammer, G. and Smithson, M. (eds.) *Uncertainty and Risk: Multi-Disciplinary Perspectives*. Earthscan: London, United Kingdom, pp: 289-303
- Smithson, M. (1989). *Ignorance and uncertainty: Emerging paradigms*. New York: Springer Verlag.

Location of this resource on the i2S website:
https://i2s.anu.edu.au/resources/unknowns-taxonomy

Additional tools can be found at: http://i2s.anu.edu.au/resources/tools

LATEST i2INSIGHTS BLOG POSTS

The i2Insights blog (http://i2insights.org) has recently published the following posts:

Capitalising on incommensurability
By Darryn Reid
https://i2insights.org/2021/03/30/capitalising-on-incommensurability/

Setting an agenda for transdisciplinary research in Africa
By Basirat Oyalowo
https://i2insights.org/2021/03/23/transdisciplinary-research-in-africa/

Considerations for choosing frameworks to assess research impact
By Elena Louder, Carina Wyborn, Christopher Cvitanovic and Angela Bednarek
https://i2insights.org/2021/03/16/evaluating-research-impact/

The art of non-decision-making
By Anthony Judge
https://i2insights.org/2021/03/09/art-of-non-decision-making/

Responding to unacknowledged disciplinary differences with the Toolbox dialogue method
By Graham Hubbs, Michael O'Rourke and Steven Hecht Orzack
https://i2insights.org/2021/03/02/toolbox-dialogue-method/

Do we need diversity science?
By Katrin Prager
https://i2insights.org/2021/02/25/diversity-science/

Visions of knowledge systems for life on Earth and how to get there
By Niko Schäpke and Ioan Fazey
https://i2insights.org/2021/02/23/knowledge-systems-transformation/

Addressing societal challenges: From interdisciplinarity to research portfolios analysis
By Ismael Rafols
https://i2insights.org/2021/02/18/research-portfolios-analysis/

Can foresight and complexity play together?
By James Burke
https://i2insights.org/2021/02/16/foresight-and-complexity/

Three types of knowledge
By Tobias Buser and Flurina Schneider
https://i2insights.org/2021/02/11/three-types-of-knowledge/

FEATURED JOURNAL

Journal of Awareness-Based Systems Change (JABSC)

The *Journal of Awareness-Based Systems Change* (JABSC) supports and informs the field of 'awareness-based systems change', an "action research approach to social transformation." The field "is a theoretical and practical innovation with significant implications for changing practice and taking a fresh look at what is needed to shift social systems, through a process of co-inquiry into the deeper structures of the social systems—the source conditions—in order to see, sense and shift them. It is an emergent cross-sectoral, inter- and transdisciplinary field that brings a first- and second-person lens to the field of systems thinking and systems change. The journal aims to reveal and support rigour in these new forms of research. It is also a place for highlighting current interesting examples of promising transformative practices and to co-inquire into these", thereby mirroring "an important spirit of our time and moment around the collective exploration of transformation from an awareness-based perspective".

JABSC "sees itself as one element of a larger intention which is to co-create a global platform which aligns and brings together a community of researchers and practitioners who, over the next decade, will advance and amplify the field of awareness-based systems change by co-developing the concepts, methods, tools and frames needed to illuminate and catalyze the evolution of social fields" (being "the source conditions that give rise to patterns of thinking, conversing, and

organizing in systems, which in turn produce practical results").

The journal has a focus on:

- "Bridging research and practice, e.g. refining and critically reflecting the theoretical, conceptual and practical foundations of awareness-based systems change.
- Linking inner and outer transformation as well as individual and collective transformation.
- Further evolving (practical) knowing about, and how to promote 'vertical literacy', e.g. by explicating and reflecting on implicit as well as embodied and tacit levels of understanding about transformation processes.
- Integrating multiple ways of knowing, such as 1st, 2nd and 3rd person methodologies, perspectives and epistemologies as they apply to social field change.
- Representing a broad range of voices, including those often marginalized in academia and the social system.
- Co-evolving new methodologies which make visible and research deeper layers of social systems and help actualize their potentials, in particular creative and 'experimental' (e.g. aesthetic, embodied, performative, arts-based) methodologies."

The journal produced its first edition in February 2021 and it is open access.

- **Website**:
  - https://jabsc.org/index.php/jabsc

Location of this resource on the i2S website:
https://i2s.anu.edu.au/resources/journal-of-awareness-based-systems-change

Additional tools can be found at: http://i2s.anu.edu.au/resources/journals

FEATURED NETWORK

research 4 impact

research 4 impact (r4i) envisions "a world in which people with diverse forms of knowledge seamlessly learn from each other, particularly those working to understand and solve complex social problems." In order to make this vision real, r4i aims to create new collaborations, both informal and formal, and this is articulated through three main goals:

- "matchmaking that creates powerful new collaborations between social scientists and community leaders
- sharing what [r4i has learned] about how to build new collaborations between people with diverse forms of knowledge
- interactive workshops that teach others how to build powerful new collaborations themselves."

Specifically, r4i has a matchmaking process where they "apply an evidence-based approach for directly connecting social scientists and practitioners, and social scientists and local policymakers…

Most of these matches are for informal collaborations in which people share knowledge, are open to learning from others, and gain new awareness of the boundaries of what they know and their lived experience."

r4i also produces easy to read articles where they share what they have learnt about how to create new collaborations. Further, they run workshops "that provides participants with the tools they need to confidently initiate new collaborations themselves." To assist in outreach, they publish an e-newsletter.

The r4i "community is growing and wide-ranging, and includes social scientists (political scientists, economists, behavioral scientists, psychologists, communications researchers, and many others), policy analysts, nonprofit leaders, government officials, and others who work on pressing problems in the public and private sphere."

r4i was founded in 2018.

- Website:
  - https://r4impact.org/

Location of this resource on the i2S website:
https://i2s.anu.edu.au/resources/research-4-impact

Additional professional associations and networks can be found at:
http://i2s.anu.edu.au/resources/associations_networks

FEATURED CONFERENCES

Call for papers for the 65th Meeting of the International Society for the Systems Sciences (ISSS) - The Art and Science of the Impossible: The Human Experience

"We need to think and act in new ways to conceive of solving the seeming 'impossible' challenges we face. Systems sciences and systems art offer immense opportunities. There are new forms of intelligences entering our lived experience, we are experiencing the dynamic state of play of politics and society, we see climate change being a reality that we must act upon, there are plans for trips to Mars, smart cities and much more. What was once considered science fiction is now becoming a reality as humanity pushes the boundaries of what is thought to be possible"

"There is an increasing need for systems and systemic thinkers as practitioners, researchers, and authors in all domains of this dynamic human activity system that we live and participate in. We need to navigate a technologically interconnected and interdependent ecosystem that is diverse and complex and is going to be mainly data driven in the future... In our 65th year, and as one of the oldest and premier professional societies dedicated to systems thinking and systems science, we invite you to join us as we seek to build wider collaborations with other systems and systems related organizations and communities".

"Papers and presentations are sought, covering areas of systems science, use of systems approaches in applications or subject sciences (natural and social), concept or position papers, and speculative (novel) thinking... Submissions related to the theme of the conference are especially encouraged, but not required".

The conference is being held virtually on 8-13 July 2021.

- For further details see:
  - https://www.isss.org/online-2021/
    - Deadlines for submissions start from 30 April 2021 and go through to through 15 June 2021

Call for papers for the 28th Biennial Subjective Probability, Utility and Decision Making (SPUDM) Conference

"The European Association for Decision Making invites submissions for presentations, posters and/or symposia for the 28th Biennial SPUDM Conference. SPUDM has been the leading European decision making and behavioural economics conference since its inception in 1969... We will host papers, discussions and posters covering the full range of modern thinking in behavioural science, behavioural economics, and judgment and decision making. We strongly encourage submissions from new researchers, from researchers in countries less represented in the JDM [Judgement and Decision Making] community, and from researchers working in new areas and in the applications of behavioural science."

The conference is being held virtually on 22-24 August 2021.

- For further details see:
  - http://eadm.eu/; and/or,
  - https://warwick.ac.uk/fac/soc/wbs/subjects/bsci/events/spudm_2021/
    - Deadlines for submissions is the 30 April 2021

Call for papers for the 43rd Annual Association for Interdisciplinary Studies (AIS) Conference - Interdisciplinary Collaboration: Navigating Between Generosity and Rigor

"Interdisciplinary Studies is marked with a focus on collaboration and integration across disciplines; across languages, cultures, and ethnicities; across genders; across abilities; across the arts and creativity".

"The AIS conference program committee encourages proposal submissions that will explore the conference theme — Interdisciplinary Collaboration: Navigating Between Generosity and Rigor — and invite contributions from all fields that address different aspects of the conference theme... As a part of this year's conference theme, we will explore questions such as:

- How do we be generous toward and encourage generosity from researchers, instructors, and students across disciplinary boundaries?
- What methodologies can be used to ensure rigor when research is conducted across disciplinary boundaries?
- How do we address differences in research methodologies/expectations between disciplines and organizational structures?

- How can we measure interdisciplinarity and the rigor of our own interdisciplinary programs to ensure that our programs prepare students to thrive in an increasingly complex world?"

The conference is being held virtually on 14-16 October 2021.

- For further details see:
  - https://interdisciplinarystudies.org/conference-2021/; and/or,
  - https://www.suu.edu/ais/
    - Presentation proposals are due by 15 May 2021

5th Interdisciplinary Learning and Teaching Conference: Interdisciplinarity: Learning from Each Other

"The conference theme asks participants to consider the elements of collaboration, co-construction of knowledge and practice that underpin the interdisciplinary teaching and learning experiences of students and teachers. The diversity of contexts in which interdisciplinarity happens in Higher Education (e.g. liberal arts, joint honours degrees, single interdisciplinary modules, etc.) means this learning happens in a multitude of ways, and the conference will be an opportunity to share how these dynamics emerge within an interdisciplinary learning journey, inform our practices and generate impact in Higher Education".

"The main topics of the conference are:
- Interdisciplinary Practices in the Varied Contexts of Higher Education
- Interdisciplinary Experiences
- Interdisciplinary Governance and Policies
- Interdisciplinary Impacts"

The conference is being held virtually on 15 April 2021.

- For further details see:
  - https://interdisciplinaryuk.net/
  - Programme available at: https://warwick.ac.uk/fac/cross_fac/iatl/news/events/iltc/schedule/

3rd Latin American Congress of Interdisciplinary Research and Higher Education (IEI 2021)

"The Third Latin American Congress of Interdisciplinary Research and Higher Education (IEI 2021) will promote spaces for the discussion of interdisciplinary projects, as well as a deeper theoretical discussion about the essential peculiarities of the formation processes of new interdisciplinary fields. It will pay special attention to the introduction in the university curricula of mechanisms that allow the creation of common languages among specialists from different areas of knowledge". There will be keynotes on:
- The mountains according to Leonardo da Vinci
- Computing as an epistemological tool: Six lessons from computer chess

Also, working sessions on:
- The interface between physics and social sciences

- Juridical constructivism and artificial intelligence
- Epidemic models and COVID-19

The conference is being held virtually on 17-21 May 2021.

- For further details see:
  - http://interdisciplina.com/en

International Association for Impact Assessment (IAIA21) Conference: Smartening Impact Assessment in Challenging Times

"Recent dramatic events worldwide, from floods and bushfires to the ongoing pandemic, call for a revaluing of the contribution of impact assessment tools to anticipating and preparing us for such challenges. Integrating environmental and health considerations into planning and decision making, across geographic scales and sectors, is essential to ensure preparedness, mitigation, adaptation, and community resilience".

"Against the backdrop of digital and technological progress and increasing global environmental, health and social challenges, this conference aims to explore related scientific, technological, and governance developments to reflect on whether the impact assessment community is getting any smarter at bridging the science and art of impact assessment. Are we exploiting the full potential of smart technologies and big data? Are we communicating scientific information appropriately across the various governance tiers and to all relevant players? Do we understand what the 'right' information is for decision-makers and, indeed, how data and methodological innovation are influencing decisions? Is this leading to a new era of impact assessment and thinking? Or do we remain in the status quo?"

"The conference will be structured in 10 thematic streams:

1. The role of impact assessment in addressing global challenges
2. Technology, data, and innovation: A move towards better global coordination in addressing pressing challenges
3. Decision impacts: How is impact assessment truly influencing decisions?
4. Strengthening the effectiveness of impact assessment through collaboration
5. Efficient communication for streamlining processes
6. Big data analytics for tackling the biodiversity crisis
7. Impact assessment and management through technological advancements including online tools
8. Information overload and impact assessment: Effectively communicating risks and uncertainties
9. Tackling contemporary environmental issues: The contribution of smart technologies to monitoring
10. Investment and financing for environmental protection".

The conference is being held virtually on 18-21 May 2021.

- For further details see:
  - https://conferences.iaia.org/2021/

29th Annual Conference of the Society for Risk Analysis: The Discipline(s) of Risk Science

"We welcome over 200 contributions from all areas of risk analysis and science, including risk assessment, risk characterization, risk perception, risk communication, risk management, risk governance and policy, relating to risks which are of concern to individuals, organizations in the public and private sector, or to society at local, regional, national, or global levels".

The conference will have keynotes and thematic sessions. The conference theme, 'The Discipline(s) of Risk Science', will be explored in a panel discussion focusing on the strong development of the risk field over the last 30-40 years. "The field is commonly referred to as interdisciplinary in its scope but it is also seen as a distinct science. The Panel will discuss foundational issues related to this field: What are these disciplines and sciences forming the risk field, and how are they interacting? Can we really speak about a distinct risk science – how is it defined and what are its basic features and challenges? Is it important for the risk field to be recognized as a distinct science? A main focus of the discussion will be on the practical implications, how the foundational work can further enhance the quality of risk assessments, risk communication and risk management, and influence and strengthen societal impact".

The conference is being held virtually on 13-16 June 2021.

- For further details see:
  - http://www.sraeurope.eu/espoo-finland-2021; and/or,
  - https://blogs.aalto.fi/srae2020/

Transformations Conference 2021: Enabling Positive Tipping Points in an Uncertain World

"In 2020 a tipping point may have been crossed on how societies worldwide deal with multiple overlapping crises. On an unprecedented scale we see groups and communities mobilizing to re-imagine and transform the pre-pandemic systems which led to current vulnerabilities, risks, and unsustainable practices. This challenging but also fertile moment calls for urgent knowledge synthesis able to enact positive tipping points and tipping interventions towards new regenerative development trajectories".

"The conference will showcase latest developments in research and practice of transformations towards sustainability, support and celebrate transdisciplinary learning networks for new collective international initiatives. Four streams will structure the event:

- Stream 1: Transformative arts and culture
- Stream 2: Transformative economies and organizations
- Stream 3: Transformative science, action-oriented knowledge and governance
- Stream 4: Enabling positive tipping points in socio-climate, energy, water and life-support coupled systems."

"This global virtual conference will take place over a period of 24h with curated live conversations by three zones: South America, Asia, and Europe".

The conference is partnered with, and a satellite event of, Sustainability Research & Innovation (SRI) Congress 2021 (https://sri2021.org/) and is being held virtually and onsite in Brisbane, Australia, on 17-18 June 2021.

- For further details see:
  - https://www.transformationscommunity.org/conference-2021

Additional conference information can be found at:
http://i2s.anu.edu.au/resources/conferences

ABOUT i2S NEWS

The aim of this newsletter is to provide regular (bi-monthly) updates about new resources added to the Integration and Implementation Sciences website (http://i2s.anu.edu.au/resources) and the Integration and Implementation Insights blog (http://i2Insights.org). It also provides occasional conference and other news items. These resources are useful for researchers interested in Integration and Implementation Sciences (i2S), which underpins the investigation and tackling of complex real world problems, by:

- Synthesizing knowledge from different disciplines and stakeholders,
- Understanding and managing diverse unknowns, and
- Providing integrated research support for policy and practice change.

In general, each issue features tools (concepts and methods), either a useful compilation or one or more examples of note. We also provide information about journals, professional associations & networks and conferences where researchers can learn from others, report their findings and interact with like-minded peers.

i2S News is archived at: http://i2s.anu.edu.au/what-i2s/i2s-publications/i2s-news.

Useful links:

- i2S website: http://i2s.anu.edu.au
- i2Insights blog: http://i2Insights.org
- i2S on YouTube: https://www.youtube.com/user/i2sTalks
- LinkedIn group "Global Network for Research Integration and Implementation": https://www.linkedin.com/groups/4888295/

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