Meta Analysis of SEAD White papers with focus on Research and Creation

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1. Introduction

This meta-analysis will be developed according to the methodology proposed in the SEAD White Paper Exploring a Model of Transdisciplinary Research Collaboration based on Collective Action Theories (Miranda de Almeida, C.; Tejerina, B.) from the perspective of Theory of Action.

This methodology offers a tri-dimensional matrix to deal with 6 different kinds of action, 4 kinds of stake-holders and 4 spheres of integration/collaboration. The matrix opens the possibility to classify transdisciplinary action in a grid of 96 possible situations that can be useful for analysing how transdisciplinary action is being achieved and to plan the future action that needs to be developed by each stakeholder within the scope of their aims, possibilities and responsibilities to produce a qualitative change in transdisciplinary practices.

The meta analysis will be done for 10 white papers that have been previously selected to be presented at the XVIII ISA World Congress of Sociology, Yokohama, Japan, 13-19 July 2014 “Facing Inequality: A proposal for sociological debate”, Session Proposal for Research Committee RC23: Sociology of Science and Technology. That set collects papers about work related to research and creative practice and transdisciplinarity.

The group of authors and white papers that are taken into consideration are:

1) Martha Blassnigg and Michael Punt, UK: Transdisciplinarity: Challenges, Approaches and Opportunities at the Cusp of History

2) Josie E. Davis, USA: A Case Study in IP arising in Art/Science Performance Research and Transdisciplinary Collaboration

3) Kathryn Evans, USA: SEAD: From Success to Succession

4) François-Joseph Lapointe, Canada: How I Became an Art[Scient]list: A Tale of Paradisciplinarity
5) D.L. Marrin, Mexico: Interactions among Scientists/Engineers and Artists/Designers in Developing a Common Language and Unique Perspectives on Today’s Challenges

6) Cristina Miranda de Almeida and Benjamin Tejerina, Spain: Exploring a Model of Transdisciplinary Research Collaboration based on Collective Action Theories

7) Jack Ox and Richard Lowenberg, USA: SARC (Scientists/Artists Research Collaborations)

8) Myriam Solar, Spain: Complexity Art: A Pattern of Transdisciplinary Emergent Properties

9) Deborah Tatar, USA: Gender and STEM: No Shift Required

II. Structure of the meta-analysis

In this meta-analysis 6 kinds of transdisciplinary actions (increase of resources, support networking, education of researchers, support research, diffusion, sensibilization and creation of interaction structures) are situated according to 4 stakeholders’ scales (individuals, communities, public and private institutions) articulated around 4 scales of interaction regarding opportunities and obstacles: (1) face-to-face interactions FFI (such as linguistic opportunities and problems, cross-communications misunderstandings, emotions and insights, etc.); (2) transdisciplinary power synergies, struggles and competitions such as those that belong to authority and power elites inside each discipline (interest groups IG); (3) institutional educational and research structures–ERS–that are discipline-based and can be seen as structures for new opportunities or threatens to any kind of transdisciplinary action; (4) social paradigm that is common in public political-administrative systems–PPAS–of funding at different levels like national, regional, European or international that are not adapted to transdisciplinary action.

Opportunities and obstacles for action will be identified according to the following kinds of action, stakeholders and spheres of integration:

2.1. Six kinds of actions

a) Increasing of resources;
b) Developing and supporting networking (engagement, participation and networking actions);
c) Educating researchers to manage trans-disciplinary collaboration;
d) Supporting research;
e) Creating diffusion, dissemination and sensibility;
f) Creating an interaction Structure.
1) (AR) Actions for increasing of resources (including advocating)
These actions aim at getting more access to funding, human and technological resources to research and collaboration across disciplinary borders.

2) (NA) Actions to support Networking
The aim of this kind of actions is to foster engagement, participation, formal and informal actions for exchanging knowledge and networking actions. Resilience and solidarity actions for supporting networked projects (NSEAD can be a kind of big umbrella for different projects and institutions towards the aim of fostering networked achievements).

3) (EA) Education actions to prepare researchers to manage transdisciplinary collaboration
Education actions are aimed at preparing researchers to manage collaboration across disciplines, develop a common language and deal with differences. In particular it is necessary to solve questions around methodological and theoretical dominance of one discipline on others and questions around theoretical and methodological integration and developing adequacy (Repko). As Repko said, multi-disciplinary approaches the ‘home’ discipline usually imposes the preferred method and theory, transdisciplinary approaches do not privilege any disciplinary method or theory and trans-disciplinary approaches integrate all knowledge, disciplinary methods and stakeholder views on the basis of some overcharging theory.

4) (ARS) Action to support research (for researchers)
Listening and follow up, to maintain a system of tracking opinion from researchers in the network. To update the cartography of researchers on the network and their results of their collaborations, creating feedback between peers.

5) (DA) Diffusion, dissemination and sensibilization actions (to create visibility towards society and sensibilize different social groups)
Sensibilization actions aim at increasing awareness about transdisciplinary collaboration. They can be carried out in the form of dissemination actions (actions for increasing sensibility of different spheres regarding transdisciplinary collaboration).

6) (AIS) Action to create an Interaction Structure
The interaction structure for transdisciplinary collaboration can be better realized within an institutional space from which the all kinds of actions can be coordinated. This space can take form as an Observatory for Networked Science, Engineering, Art and Design.
The aim is to enable agents that support transdisciplinary approaches to be in positions of power in decision-making processes. This can be achieved by complementing the network of SEAD (The Network for Science, Engineering, Art and Design) with an International Observatory for NSEAD Knowledge, to fully protect transdisciplinary collaboration.
SEAD Observatory for Networked Science, Engineering, Art and Design should be able to plan, coordinate, implement and manage all aspects of transdisciplinary collaborations. The Observatory would be supported by social network and social media platforms (transmedia approach), and coordinate the implementation of all kinds of actions (AR, NA, EA, ARS, DA). The objectives of the SEAD Network Observatory can be:
1) To situate NSEAD transdisciplinary collaboration in the main political objectives and institutional guideless of research at any level to accelerate the development of sustainable, innovative and inclusive transdisciplinary Knowledge in society;
2) To foster, implement and look for funding to network knowledge and collaboration in the NSEAD transdisciplinary field. The NSEAD Observatory can be supported in a network of observatories such as European NSEAD Observatory, National NSEAD Observatories. These observatories can be created also at lower levels;
3) To overcome hurdles in the development of an transdisciplinary knowledge Society;
4) To foster interoperability of solutions across countries; to treat transdisciplinary Knowledge in the global and local scales;
5) To generate awareness in different stakeholders in the Research and knowledge sector to mobilise the needed financial and human resources to carry out actions;
6) Stimulation actions for transdisciplinary research: Promote annual research grants for researcher groups with the requirement of the participation of at least 2 fields collaborating.

2.2. Four kinds of stakeholders

a) Individuals (I)
b) Communities (C)
c) Public Institutions (PubI)
d) Private Institutions (PrI)

Actions analysis should take into consideration basically two kinds of agents: sympathy and resistance agents. Sympathy agents are individuals, collectives and organized groups that work to facilitate transdisciplinary dialog and collaboration around similar or equal objectives. Resistance agents are other social and political actors with which they come into competence or conflict.
The analysis takes into consideration 4 types of stakeholders such as individual, communities (structured and formally organised, like professional associations, and ad hoc interest alliances, linked to disciplinary fields) and public and private institutions (not linked to disciplines like banks for example), acting in 4 scales (local L, regional R, national N and international I scales) apart from 6 kinds of actions.

2.3. Four spheres of interaction

Opportunities and obstacles are identified according to different spheres of interaction.
1) **Face to face interactions (FFI):** in the scale of face-to-face interactions FF (such as linguistic opportunities and problems, cross-fertilised support, misunderstandings and insights, etc.);

2) **Interest groups (IG):** in the scale of inter-disciplinary power synergies, struggles and competitions such as those that belong to authority and power elites inside each discipline (interest groups);

3) **Education and Research Sphere (ERS):** in the scale of institutional educational and research structures that are discipline-based and can be seen as structures for new opportunities or threatens to any kind of interdisciplinary action;

4) **Institutional Paradigm Level (IPL):** in the scale of the institutional paradigm that is common in public political-administrative systems of funding at different levels like national (Na), regional (R), European (EU) or international (IN) that are not adapted to interdisciplinary action (for instance, it is considered appropriate that a scholar follows a unique lineal disciplinary path during her/his academic trajectory and any break in this lineal path needs to be justified so that the carrier is considered adequate to academy, what reflects a Cartesian mode of thinking about academia and constitutes an obstacle for interdisciplinary fluidity).

Papers will be analysed and information will be organised according to the aspects mentioned parting from each action.

**III. Actions meta-analysis**

**Actions type one: Increasing of resources**

1- Acknowledging and integrating new forms of bottom up knowledge; construction, production, dissemination and storage that are current in digital culture (I,C,Publ,Prl) (FF, IG, ERS);
2- Opening disciplinary institutional borders: accepting scientist and artists as both teachers and researchers in institutions traditionally reserved to each one of the disciplines (Publ, Prl) (IG, ERS, IP);
3- Accepting scientific projects in art venues and art projects in scientific venues (C, Publ, Prl) (IG, ERS, IP);
4- Accepting art publications (with scientific method) in science journals and scientific publications in art journals (C) (IG, IP);
5- Creating new breaking-ground unusual funding categories such as sewable computing (Publ, Prl) (IG, IP);
6- Re-evaluating potential partnerships between art and science (C, Publ, Prl) (IP);
7- Positive discrimination mechanisms to support trans-disciplinary curriculums (Publ, Prl) (IG, ERS, IP);
8- Creating a common language (C) (FF, IG, ERS, IP);
Actions type 2: Supporting networking

1- Preparing, developing and implementing physical and online spaces for sharing that foster enduring communities through (I, C, PubI, PrI) (FF, IG, ERS, IP):
   (a) Developing of a website (C, PubI, PrI) (FF, IG, ERS, IP);
   (b) Creating and housing of a data base (C, PubI, PrI) (FF, IG, ERS, IP);
   (c) Implementing physical residences and environments for artists and scientist to share in a face-to-face physical basis (C, PubI, PrI) (FF, IG, ERS, IP);
   (d) Promoting physical occasions for meeting around complex educative problems, for example environmental clean-ups; or engaging with DIY movement to integrate minorities like women, elders, children, emigrant communities around workshops art-science-tech (I, C, Publ, Prl) (FF, IG, ERS, IP);
   (e) Creating specialized journals of all kinds (scientific and dissemination ones) for publication of experiences, processes, projects, example Lego magazine, or Leonardo Journal) (C, Publ, Prl) (FF, IG, ERS, IP);

2- Igniting connections between institutions that support and fund art-tech-science in a separate basis (cluster them), for instance High-low tech Lab MIT) (IG/ERS/IP);

3- Creating a cloud-based database for curriculums (I, C, Publ, Prl) (FF, IG, ERS, IP);

4- Creating a cloud-based database for syllabi, resources, bibliography resources (C, Publ, Prl) (FF, IG, ERS, IP).

Action type 3: Educating researchers to manage transdisciplinary collaboration

1- Clarifying concepts (trans-multi-inter-trans) that qualify collaboration across disciplines (I, C) (FF, IG, ERS);

2- Preparing experts on trans-disciplinary dialogue and practices to support research (Publ, Prl) (ERS);

3- Supporting risk taking, ground breaking visions (no-grounded yet) and long term results (complementary to short term results) (Publ, Prl) (IG, IP);

4- Educating regarding Intellectual property (IP) issues that emerge in trans-disciplinary SEAD-based environments and projects (Publ, Prl) (ERS, IP);

5- Developing trans-disciplinary literacy tools to bridge the gap in trans-disciplinary illiteracy regarding SEAD-based approaches; literacy about IP rights; illiteracy about how to share in heterogeneous environments in which no common language exists (Publ, Prl) (FF, IG, ERS, IP);

6- Inscribing SEAD in academic curriculums at undergraduate, graduate and post-graduate levels (Publ, ERS, IP);

7- Educating artists and scientists on how to create a dialogue for collaboration (Publ, Prl) (ERS);

8- Teaching methods to facilitate collaboration in complex environments (Publ, Prl) (ERS);

9- Reformulating art curriculum according to a different framework based on complexity (art and aesthetic complexity). Developing principles, methodology and curricula- Introducing history of science, philosophy of science, scientific method, science of complexity in the curriculum of art and vice-versa (Publ, Prl) (ERS, IP);
10- Bridging the literacy gap regarding women and children in relation to technology and science (developing bottom up workshops) (Publ) (ERS);
11- Fostering life-long learning (Publ, PrI) (ERS, IP);
12- Turning Universities and Colleges into places to think on advanced methodologies to facilitate collaboration and networking instead of bastions of disciplinary borders (Publ, PrI) (ERS, IP);
13- Developing didactic aspects from art and science to support teaching in both spheres (art as medium to teach science and science as medium to teach art) (Publ, PrI) (ERS).

**Action type 4: Supporting research**

1- Promoting speculative ground breaking research (Publ, PrI) (ERS, IP);
2- Developing tendrilines (or research lines) of trans-disciplinarity (Klein, 2010);
3- Fostering meta-approaches in research (Publ, PrI) ((ERS, IP);
4- Developing tools to help researchers (ex. templates for contracts, IP legal issues; guidelines to orient about roles, possible problems to different stake holders, administrative roles) (Publ, PrI) (IG, IP);
5- Developing a set of transdisciplinary criteria (maybe a manifesto?) (C) (IG);
6- Mapping efforts, make them visible (I, C, Publ, PrI) (IG);
7- Fostering para-disciplinarity (para-disciplinarity happens when the same individual masters the technical tools and epistemological discourses of the 2 fields and also contributes to both art and science) (Publ, PrI) (ERS);
8- Developing new quantitative and qualitative metrics and criteria to evaluate trans-disciplinary contributions (Publ) (IP);
9- Making research protocols more flexible to accommodate non-traditional practices and technologies (benefitting from epistemological differences) (Publ, PrI) ((IG, IP);
10- Creating pilot projects to test possibilities for trans-disciplinary collaboration (Publ, PrI) (ERS);
11- Organising conferences to concrete subjects to support the practice trans-disciplinary research (for example conferences on IP issues) (C, Publ, PrI) (IG, ERS);
12- Creating a research database with calls, available funding and researchers (C, Publ, PrI) (FF, IG, ERS, IP);
13- Develop a comparative map of methodologies from different fields (Publ) (ERS);

**Action type 5: Creating Diffusion, dissemination and raising social sensibility**

1. Organising conferences to concrete subjects to disseminate and make visible the results of trans-disciplinary research (C, Publ, PrI) (FF, IG, ERS, IP);
2. Creating a research database for dialogue and diffusion to other fields (C, Publ, PrI) (FF, IG, ERS, IP);
3. Creating opportunities to engaging social groups to bridge the technological and scientific gap (attracting children and women into technological and scientific carriers with a STEAM approach) (C, Publ, PrI) (FF, IG, ERS, IP).
Action type 6: Creating an Interaction Structure

1. Developing trans-disciplinary online and offline environments (C, PubI, PrI) (FF, IG, ERS, IP);
2. Designing protocols to conflict resolution in trans-disciplinary research (for example regarding IP, trademark violation and rights (C, PubI, PrI) (FF, IG, ERS, IP);
3. Building a common language (C, PubI, PrI) (FF, IG, ERS, IP);
4. Building trust between SEAD partners (I, C, PubI, PrI) (FF, IG, ERS, IP);
5. Support complex teams with tools for collaboration, strategies to deal with different expectancies about results and integrate aims (C, PubI, PrI) (FF, IG, ERS, IP);
6. Form technical experts to support mediation, organization and dialogue in complex trans-disciplinary groups (I, C, PubI, PrI) (FF, IG, ERS, IP);
7. Changing the paradigm: understanding integration as a dynamic process and art as the art of complexity (C, PubI, PrI) (FF, IG, ERS, IP).

IV. Conclusions

It is important to observe that some actions have more impact regarding the number of stack-holders implied for their implementation and the number of spheres of integration touched. This means that these actions are more complex to be achieved (as they require to dialogue with multiple agents) but, at the same time, their impact is felt in a broader sphere of integration, their resonance is bigger.

The development of a scale of integration in which all these actions, stakeholders and spheres of integration are measured in relation to each other could be a next step in this meta-analysis.

Bibliography


