

INTERDISCIPLINARITY – ALL BEGINNINGS ARE DIFFICULT

A model for successfully starting interdisciplinarity

Theoretical background

The rise of interdisciplinarity (ID) (Data on Federal Research and Development Investments, 2010) is driven by the need to solve societal problems (Facilitating interdisciplinary research, 2005). However, successful ID is not easy to achieve (Szostak, 2013). Different languages (Miller & Boix Mansilla, 2004), different research paradigms, different methods as well as different conventions for collecting and analyzing data (Fuest, 2004) often pose problems. The development of strategies for achieving and managing ID remains a core issue (Lyllal & Fletcher, 2013). Thus, we focused our research on strategies for successful ID. During the research process we concretized our research question:

“What are beneficial strategies in the initial phase of interdisciplinarity?”

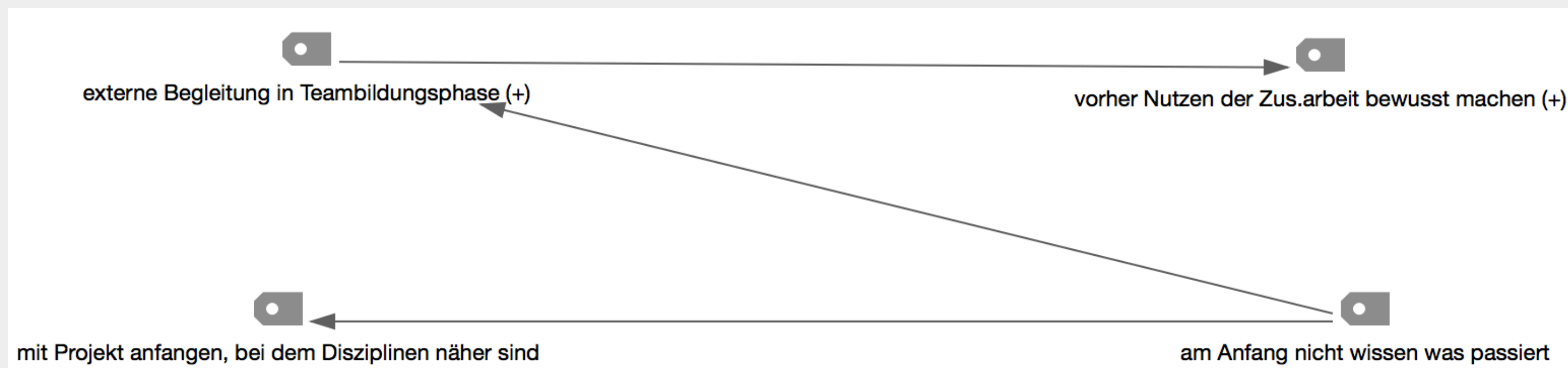
Methodological background

With the aim of developing a grounded theory for ID based on expert interviews we developed an interview guideline, primarily with the SPSS-method (Heffnerich, 2011):

- Can you tell us about your experience with interdisciplinarity?
- What was helpful and what was not?
- In reflection, what is your conclusion?

Using grounded theory methodology (GTM) (Strauss & Corbin, 1996) we selected a theoretical sample of 12 experts (4 women) in ID from industry, science, and the international service sector (average length of interview 38 min., SD = 9,29).

Research Process with MAXQDA



Anfang Beispiel Dinge Disziplin Disziplinen Fall Frage Interdisziplinarität
Leute Menschen Okay Projekt Team Thema
Zusammenarbeit andere anderen anders
arbeiten denke doch erst finde geht gemacht gerade
gesagt glaube gut interdisziplinäre interdisziplinären klar
kommen kommt können lachen
machen mehr müssen nochmal sage schwierig
stark tun unterschiedliche verschiedenen viele Wichtig wieder
zusammen

Dokument	Suchbegriff	Anfang	Ende	Vorschau
AH_2015_09_08_StHe...	Anfang	3	3	vielleicht noch zu mir am ANFANG. Also, ich bin Studentin in der
AH_2015_09_08_StHe...	anfang	9	9	Und ANFANGen würde ich gerne mit der Frage, ob Sie mir erst mal ...
AH_2015_09_08_StHe...	Anfang	10	10	in der Stiftung eigentlich von ANFANG an die Arbeit geprägt hat. Und
AH_2015_09_08_StHe...	Anfang	14	14	dem zu tun, was man ganz am ANFANG erzählt hat. Das heißt also, ...
AH_2015_09_08_StHe...	Anfang	14	14	man jetzt einfach auch von ANFANG an sagen könnte: Ich forsche j...
AH_2015_09_08_StHe...	ANFANG	19	19	Sie denn sagen, was ist in der ANFANGSZEIT hinderlich und förderli...
AH_2015_09_08_StHe...	anfang	21	21	gleich mit dem Schwersten ANFANGen, ne? Also, man kann sich ja ...

Codesystem	KG_2...	KG_2...	AW_2...	AW_2...	KW_...	KW_...	MK_2...	MK_2...	VF_2...	VF_2...	AH_2...	AH_2...	SUM...
Beneficial strategies in the initial phase of ID													0
Trusting													0
Integrating													193
Opening oneself up													260
Building bridges (leadership)													100
Investing													73
SUMME	71	102	20	24	53	39	66	59	83	69	13	27	626

1. Open & axial coding: Creative Coding

Firstly, open coding was achieved by deconstructing each interview sentence by sentence thereby identifying concepts and categories. Secondly, axial coding was used to identify relations of concepts and predefined categories (Strauss & Corbin, 1996).

2. Visualizing data: MAXQDA Tag Cloud

To check on the key concepts and visualize our data we used amongst other features MAXQDA tag cloud including all German stop lists. After sampling and analyzing six interviews we concretized the research question (see above).

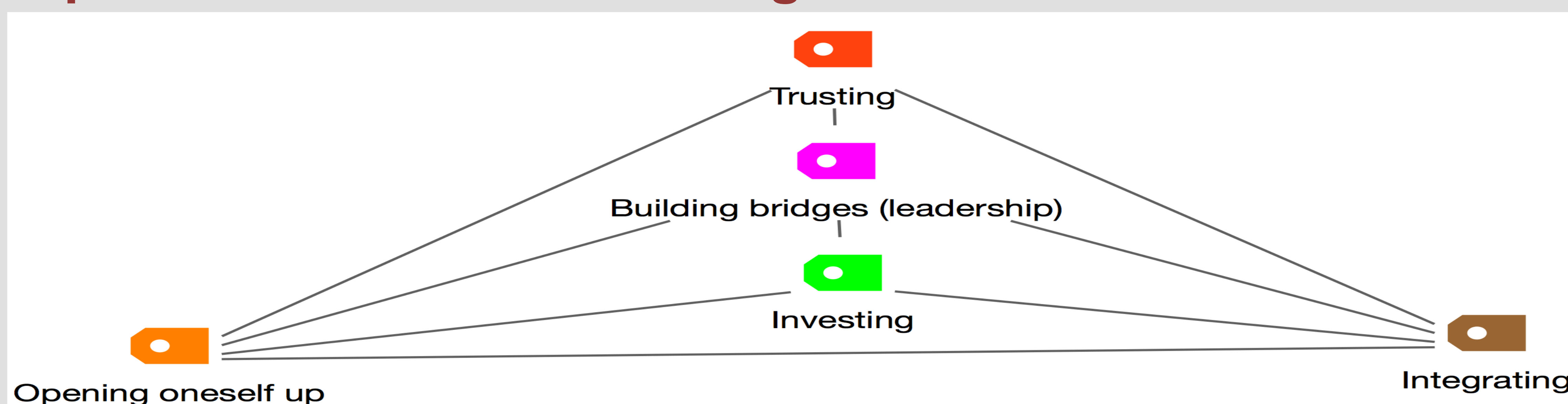
3. Refining the code system: MAXQDA Lexical Search

We developed a system of key terms regarding the initial phase of ID, e.g. ‘at first’, ‘in the beginning’, etc. Using lexical search by MAXQDA we coded the sample again (MAXQDA intercoder reliability between 79,82 and 98,95 %).

4. Visualizing codes: MAXQDA Code-Matrix-Browser

To analyze how the the frequency of the codes spread across the 12 interviews we used MAXQDA Code-Matrix-Browser. Data revealed that the interviewee who stressed the initial phase (“You recognize a winner at the start!”) also stressed the strategy of “Trusting”.

MAXMaps Model: Beneficial Strategies in Initial Phase of Interdisciplinarity



Discussion

Our finding that the initial phase of ID is especially important is only supported by Lange and Fuest (2015) which may be due to the fact that so far no phase model of ID has been developed. However, “Trusting” as a key strategy for successful ID is in line with other research (e.g. Blackwell et al., 2009; Derrick et al., 2011; Nancarrow et al., 2013). Szostak (2013) and Bamberg (2011) stress the general importance of “open-mindedness”. Bruce et al. (2004) underline that “ID rarely develops quickly”. In their process models of ID Klein (1990), Newell (2001) and Repko (2007) include “Integrating” as important step. Lyllal, Bruce, Marsden and Meagher (2011) hold a “visionary leadership” as important.

Limitations! Our research only includes (successful) strategies and does not reach theoretical saturation. A phase model of ID needs to be developed. A confirmation of the strategies by quantitative research is needed.

References

Facilitating interdisciplinary research. (2005). Washington, D.C.: National Academic Press.
 Bamberg, E. (2011). Voraussetzungen und Hindernisse interdisziplinärer Kooperation in der Arbeitswissenschaft. *Zeitschrift für Arbeitswissenschaft*, 65(1), 19–25. Retrieved from www.zfa-online.de/informationen/leser/volltexte/2011/2011_01_volltexte/Beltrag3_2011_1.pdf
 Blackwell, A., Wilson, L., Street, A., Boulton, C., & Kneil, J. (2009). *Radical innovation: crossing knowledge boundaries with interdisciplinary teams*. Technical Report (No. 760). Retrieved from University of Cambridge website: http://www.ci.cam.ac.uk/techreport1
 Bruce, A., Lyllal, C., Tai, J., & Williams, R. (2004). Interdisciplinary integration in Europe: The case of the Fifth Framework programme. *Futures*, 36(4), 457–470. doi:10.1016/j.futures.2003.10.003
 Committee on National Statistics, National Research Council, Panel on Modernizing the Infrastructure of the National Science Foundation Federal Funds Survey, & Division of Behavioral and Social Sciences and Education. (2010). *Data on Federal Research and Development Investments: A Pathway to Modernization*.
 Derrick, E. G., Falk-Krzesinski, H. J., & Roberts, M. R. (2011). *Facilitating interdisciplinary research and education: A Practical Guide*. Retrieved from http://www.aas.org/sites/default/files/reports/interdisciplinary%20Research%20Guide.pdf
 Fick, U. (2009). *An Introduction to Qualitative Research*. Fourth Edition. London: SAGE Publication.
 Fuest, (2004). *Wie reden von Interdisziplinarität aber keiner tut es? - Anspruch und Wirklichkeit interdisziplinären Arbeitens in Umweltaufstellungsprojekten*. Retrieved from http://www.heidelberger-leser-zelten-verlag.de/archiv/online-archiv/fuestneue.pdf
 Heffnerich, C. (2011). *Die Qualität qualitativer Daten: Manual für die Durchführung qualitativer Interviews*. Wiesbaden: VS Verlag für Sozialwissenschaften.
 Klein, J. T. (1990). *Interdisciplinarity: History, theory, and practice*. Detroit: Wayne State Univ. Press.
 Lange, H., & Fuest, V. (2015). *Optionen zur Stärkung inter- und transdisziplinärer Verbundforschung*. Abschlussbericht (201). Retrieved from artec-paper website: www.uni-bremen.de/fileadmin/user_upload/single_sites/artec/artec_Dokument/artec_papier2015_papier.pdf
 Lyllal, C., Bruce, A., Marsden, W., & Meagher, L. (2011). *Key success factors in the quest for interdisciplinary knowledge: Success - Factors - Interdisciplinary.pdf*
 Lyllal, C., & Fletcher, I. (2013). Experiments in interdisciplinary capacity - building: The successes and challenges of large - scale interdisciplinary investments. *Science and Public Policy*, 40(1), 1–7. doi:10.1093/scipol/scs113
 Miller, M., & Boix Mansilla, V. (2004). *Thinking Across Perspectives and Disciplines* (No. 27). Retrieved from Harvard University website: http://evgreen.edu/washingtoncenter/docs/resources/millerbox.pdf
 Nancarrow, S. A., Booth, A., Ariss, S., Smith, T., Enderby, P., & Roots, A. (2013). Ten principles of good interdisciplinary team work. *Human resources for health*, 11, 1–11.
 Newell, W. H. (2001). *A Theory of Interdisciplinary Studies. Issues in Integrative Studies*, 19, 1–25.
 Repko, A. F. (2007). *Integrating Interdisciplinarity: How the Theories of Common Ground and Cognitive Interdisciplinarity Are Informing the Debate on Interdisciplinary Integration*. *Issues in Integrative Studies*, 25, 1–31.
 Repko, A. F. (2008). *Interdisciplinary research*. Thousand Oaks, CA: Sage.
 Strauss, A. L., & Corbin, J. (1996). *Grounded theory: Grundlagen qualitativer Sozialforschung* (Reprint). Weinheim: Beltz.
 Szostak, R. (2013). *The State of the Field: Interdisciplinary Research*. *Issues in interdisciplinary studies*, 31, 44–65.