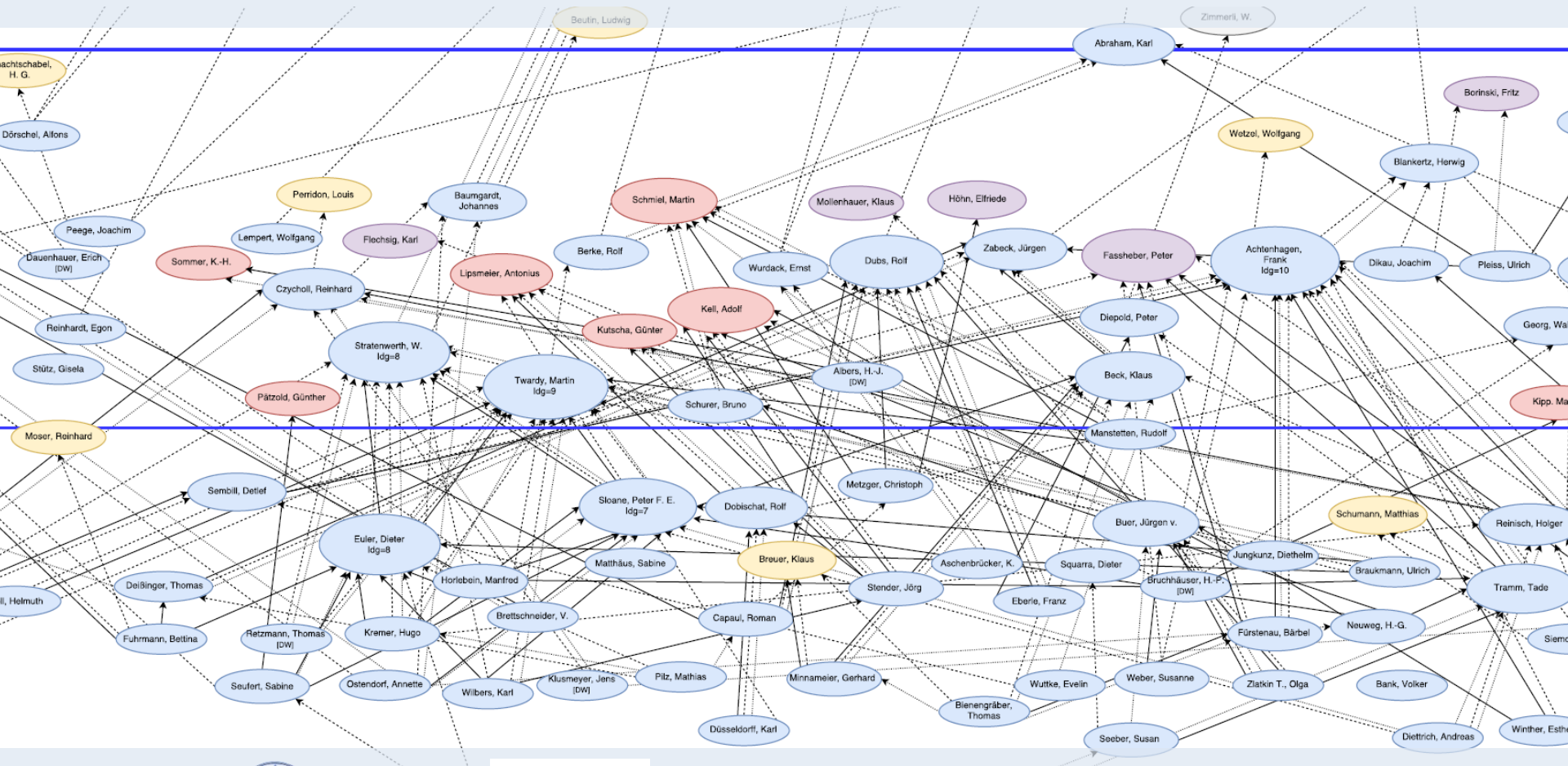


The Academic Institutionalisation of VET as a Science in the German-speaking Area

A Collective-Biographical and Network Analytical Study of Discipline Formation in the 20th Century



Structure

(1) Questions to the sociology of science

(2) The research project 'netzwerk-bwp'

(3) A preliminary study on business education

(4) Current work and problems

(5) Research prospects

What are sciences or scientific disciplines?

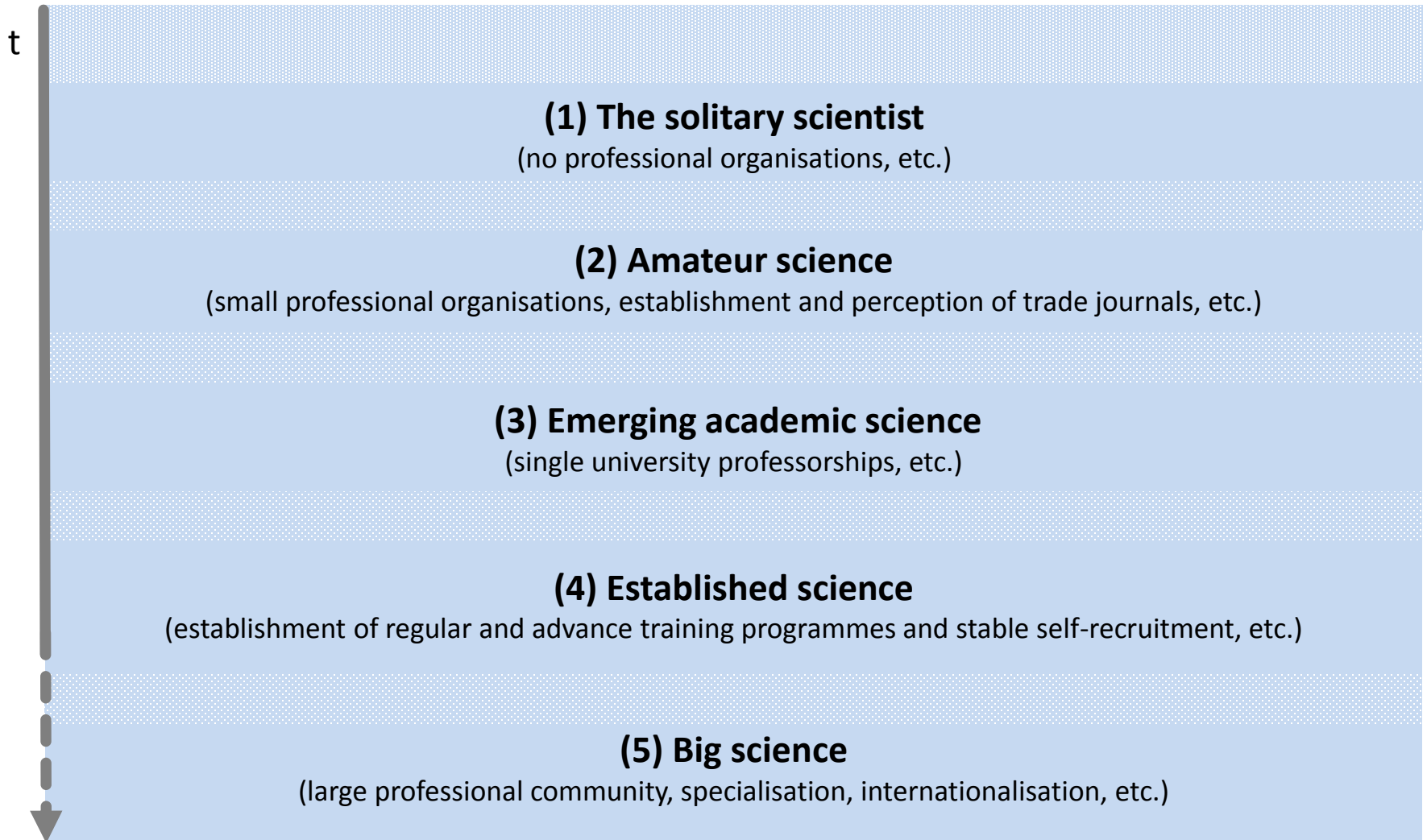
An attempt of a working definition of sociology of science

(📖 Stichweh, 2013; 1984; Reinisch, 2009)

- Scientific disciplines are **communication communities of specialists** (so-called **scientists**).
 - The members of the scientific disciplines (*in the narrow sense*) have
 - **university professorships** or chairs.
 - an **accepted corpus of scientific knowledge** about a certain subject area.
 - a set of questions, theories, research methods (so-called **paradigms**).
 - regular training programmes (or **courses of study**).
 - advanced training programmes (or **PhD programmes**)
- This kind of **institutionalisation** enables a discipline to offer scientific careers in order to reproduce itself and to grow if possible.

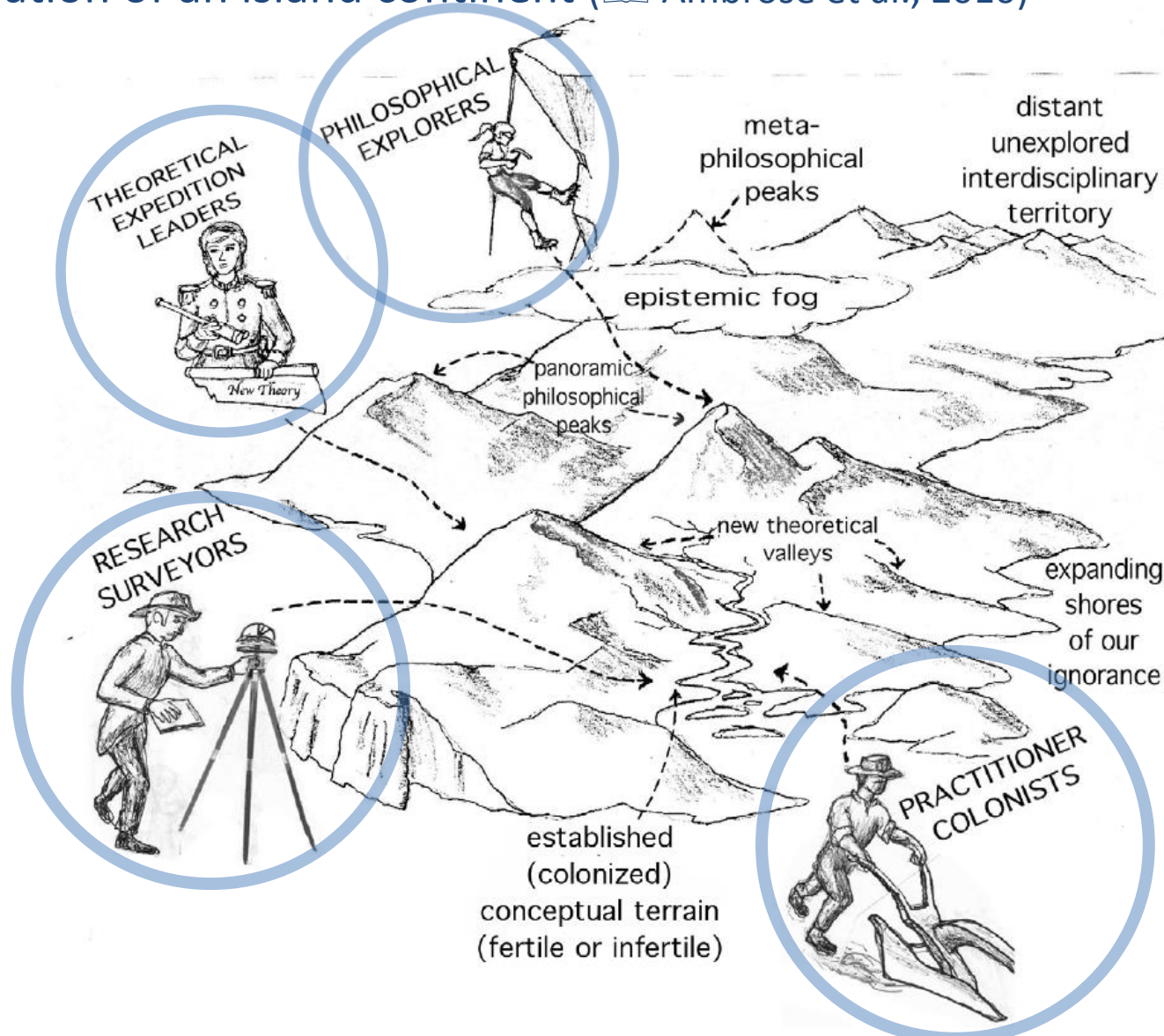
How do scientific disciplines emerge?

The stages of scientific institutionalisation (📖 Clark, 1972)



What do established scientific disciplines look like?

Levels of analyses in an academic discipline portrayed metaphorically as exploration of an island continent (📖 Ambrose et al., 2010)

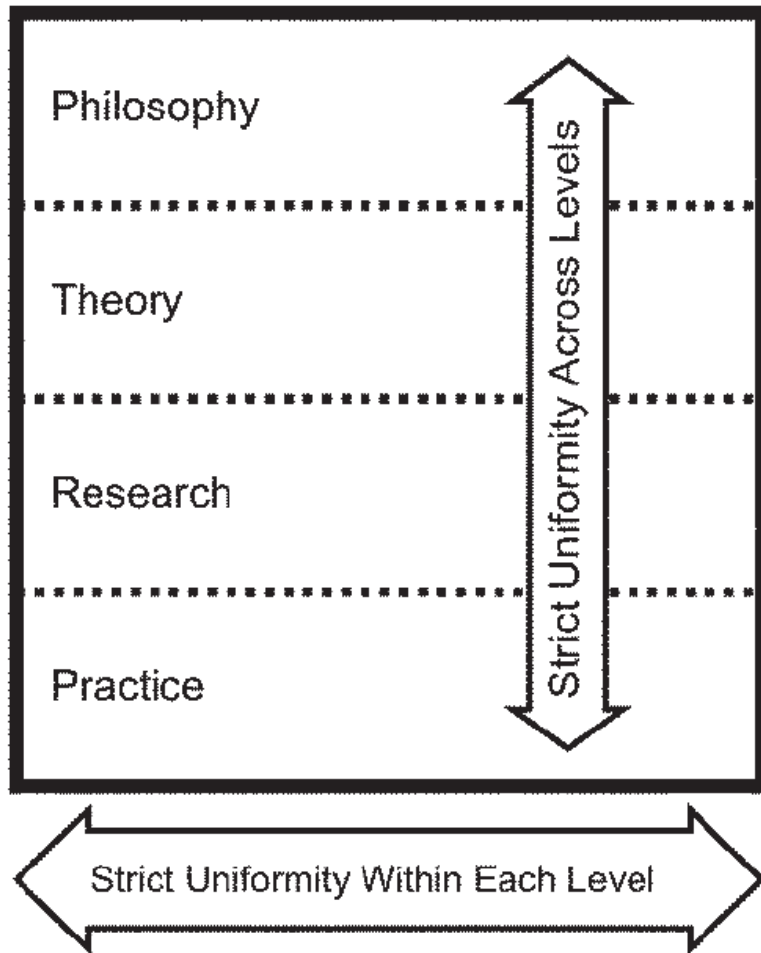


Structure and dynamics of two ideal-types of academic disciplines

(📖 Ambrose et al., 2010)

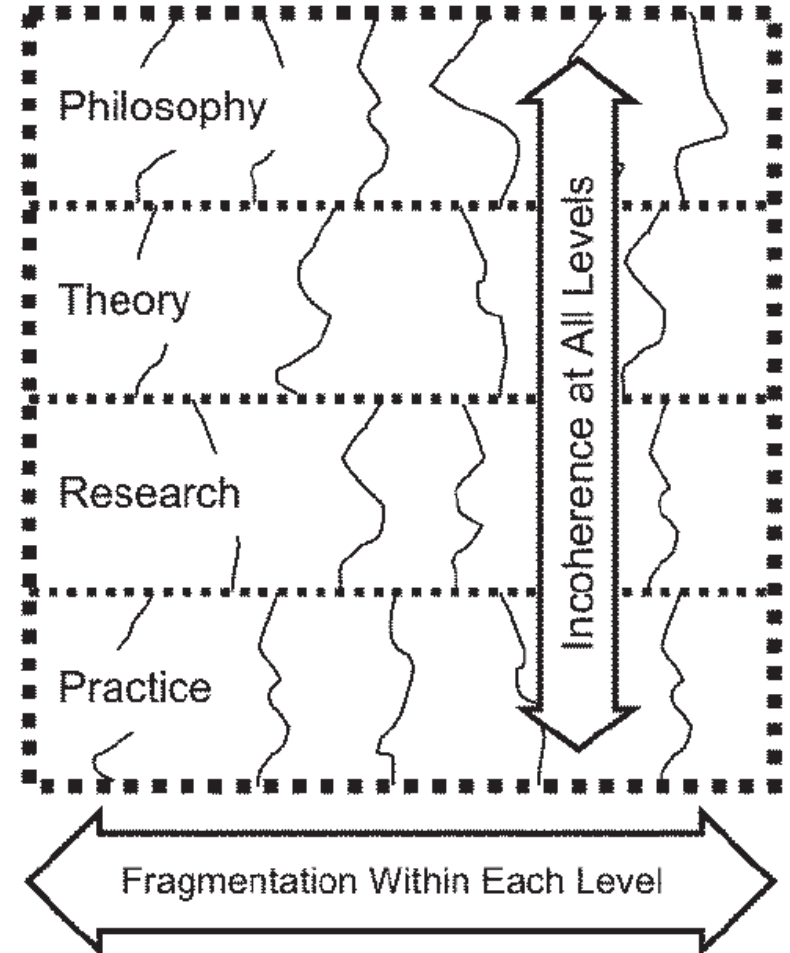
Unified, Insular, Firmly Policed Academic Discipline

↳ Borders Impervious to Interdisciplinary Invasion



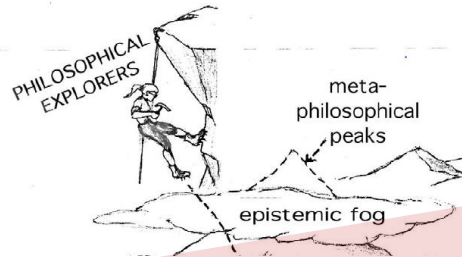
Fractured, Porous, Contested Academic Discipline

↳ Borders Wide Open to Interdisciplinary Invasion



Paradigms and paradigm-shifts in educational science and VET in the German-speaking area in the 20th century

A short outline of a top-down approach (📖 Horlebein, 2009; Lange et al., 2001)



**classical theory of
(vocational) Bildung**

hermeneutic approach

critical theory

critical rationalism

empirical turn

action research

constructivism

model experimental
research

grounded theory

research on teaching
and learning

design-based
research

Structure

- (1) Questions to the sociology of science
- (2) The research project 'netzwerk-bwp'**
- (3) A preliminary study on business education
- (4) Current work and problems
- (5) Research prospects

Overview of the entire research programme

A short outline of a bottom-up approach ( Götzl et al., 2018)

- **Long-term focus:**
 - Development and differentiation of vocational and business education ('Berufs- und Wirtschaftspädagogik') or VET as a science and its relations to neighbouring disciplines as communication community of scientists
 - with a special focus on paradigms and paradigm-shifts (e. g. Fleck, 2017; Kuhn, 2014)
- **Starting point:**
 - Systems-theoretical differentiation of disciplines (e. g. Stichweh, 2013) by using different (partial-)theories of science studies (e. g. Clark, 1972)
- **Methodical approaches:**
 - Collective biographical and network analyses (e. g. Stegbauer & Rausch, 2013; Schröder, 2011; Jansen, 2006) of VET scientists (in this contribution: Professors of VET)
 - bibliometric analyses (e. g. journals, course and handbooks)
 - Oral History or biographical research (e. g. interviews with scientists)

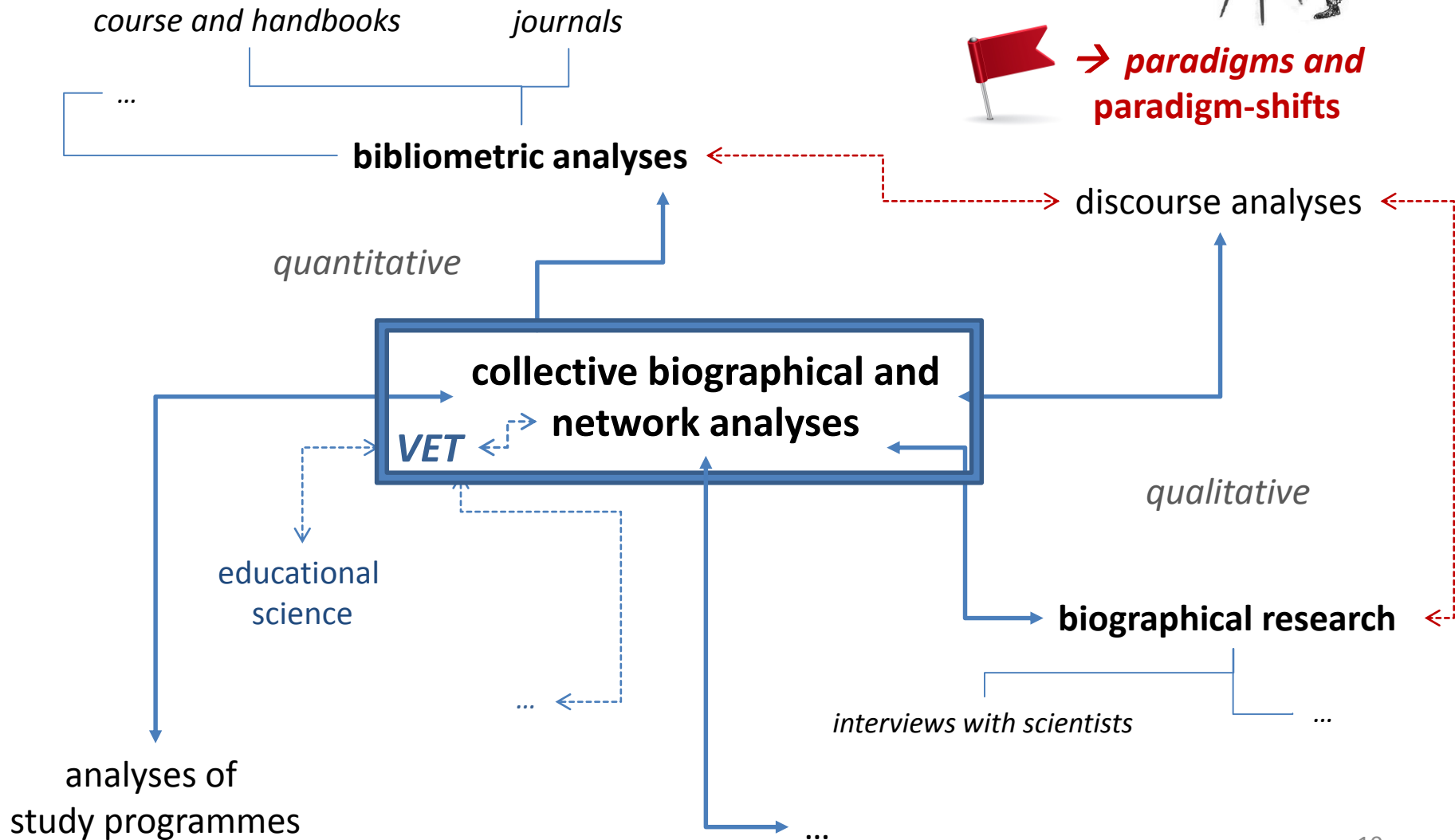
Research focuses

A sketchy overview of a bottom-up approach

SURVEYORS OF RESEARCH



 → **paradigms and paradigm-shifts**



Why do we first develop a collective biography or a biographical network of scientists of VET in the German-speaking area? (📖 Kuhn 1970)

‘Both normal science and revolutions are, however, community-based activities. To discover and analyze them, one must first unravel the changing community structure of the sciences over time. A paradigm governs, in the first instance, not a subject matter but rather a group of practitioners. Any study of paradigm-directed or of paradigm-shattering research must begin by locating the responsible group or groups.’



Structure

- (1) Questions to the sociology of science
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Where does the VET as a science in the German-speaking area come from or why does it exist? – A synopsis (📖 Zabeck, 2009, 520-534)

Business Education (BE)

(,Wirtschaftspädagogik')

- Result of the development of ,Handelsschulen' (transl. commercial schools) and ,Handelshochschulen' (transl. higher education institutions of commerce) in the 19th century against the background of an already existing need for teacher training.
- Establishment of teacher training courses at ,Handelshochschulen' (transl. higher education institutions of commerce) at the transition to the 20th century (first 1898 at the ,Handelshochschule' Leipzig).
- **First professorship** 1906 in Berlin (Dunker) or **1923** in Leipzig (**von der Aa**). According to prevailing opinion, Leipzig 1923 is the first chair of BE (Reinisch 2009; Zabeck 2009).



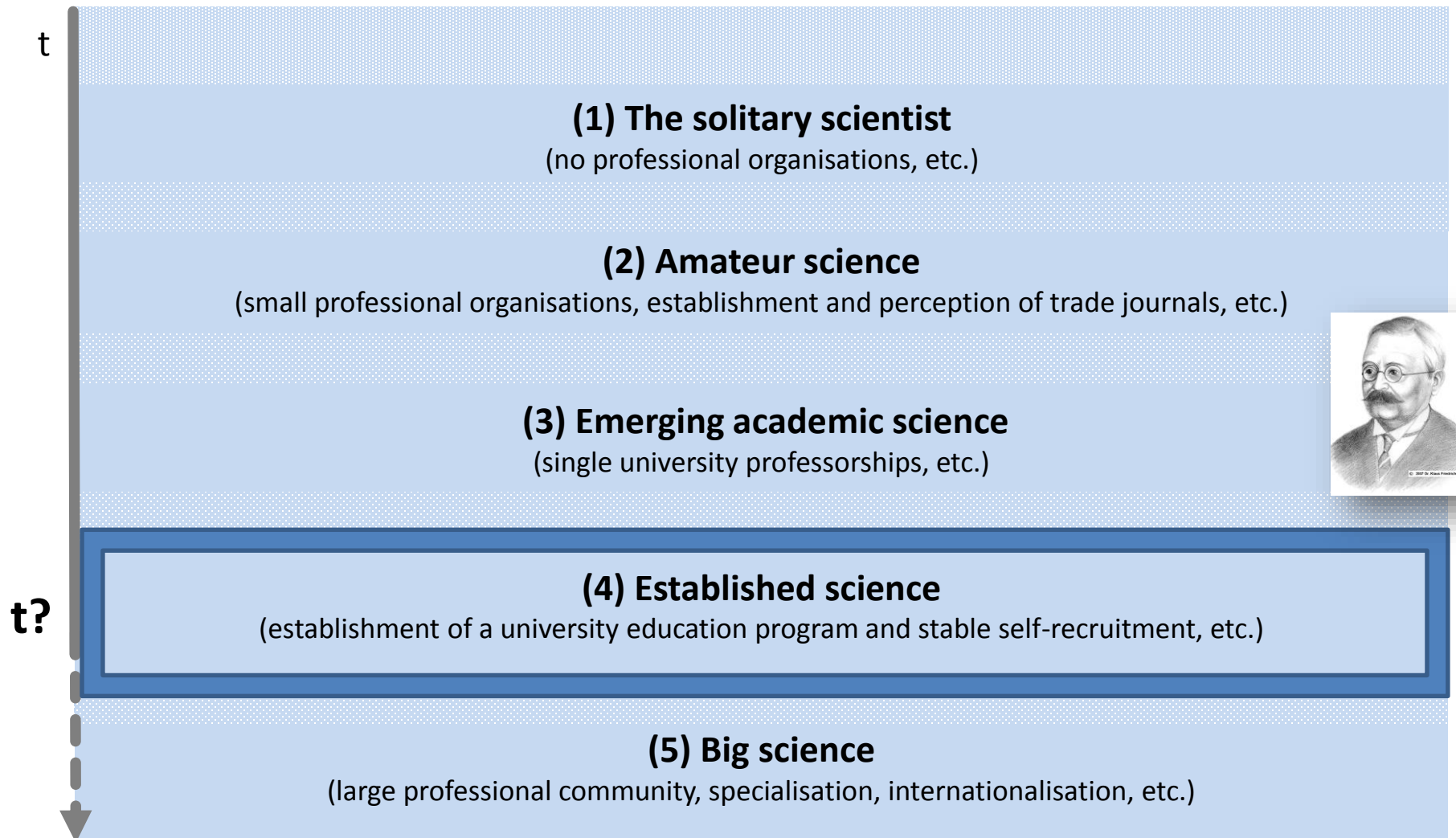
Vocational Education (VE) in the strict (German) sense (,Berufspädagogik')

- Result of the development of ,Fortbildungsschulen' (transl. continuation schools) in the 19th and 20th century against the background of an already existing need for teacher training.
- First only teacher training courses outside of ,universities' as from the year 1913 (so-called ,seminaristische (Gewerbe-) Lehrerbildungsgänge an Berufspädagogischen Instituten', first Berlin, later on in Frankfurt a. M., Köln und Königsberg).
- **First professorship** of VE **1951** in Hamburg (**Riedel**) or **1963** in Darmstadt (**Abel**); contradictory statements in literature.

Scientific interlocking of Vocational and Business Education (VET) as an educational partial discipline took place in the late 1960s, e. g. in the subdivision of VET of the German Educational Research Association (GERA) (since 1964).

The theoretical access

The stages of scientific institutionalisation (📖 Clark, 1972)



Research question

focused in the preliminary study on business education

(F1) From what generation onwards can BE be described as an established science or (partial-)discipline of educational science (in the sense of Clark, 1972)?

(F2) ...

Hypotheses of F1

with reference to the stages of scientific institutionalisation ( Clark, 1972)

- (H1) In the progressing establishment process, the number of BE professors increases.
- (H2) In the progressing establishment process, the initial appointment age of the BE professors decreases.
- (H3) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases.
- (H4) In the progressing establishment process, the relative share of non-discipline professors who are in qualification and/or employment relationships with professors of the BE decreases.
- (H5) ...

Zabeck's (2006) generational classification of BE

by initial appointments



Generation 1

(Initial appointments
(IA) before 1955/60)

e. g. Friedrich Feld (*1887 – † 1945), Friedrich Schlieper (*1898 – † 1981) & Karl Abraham (*1904 – † 1990)

Generation 2

(IA from 1955/60)

e. g. Herwig Blankertz (*1927 – † 1983), Lothar Reetz (*1931 – † 2016) & Frank Achtenhagen (*1939)

Generation 3

(IA from 1985/90)

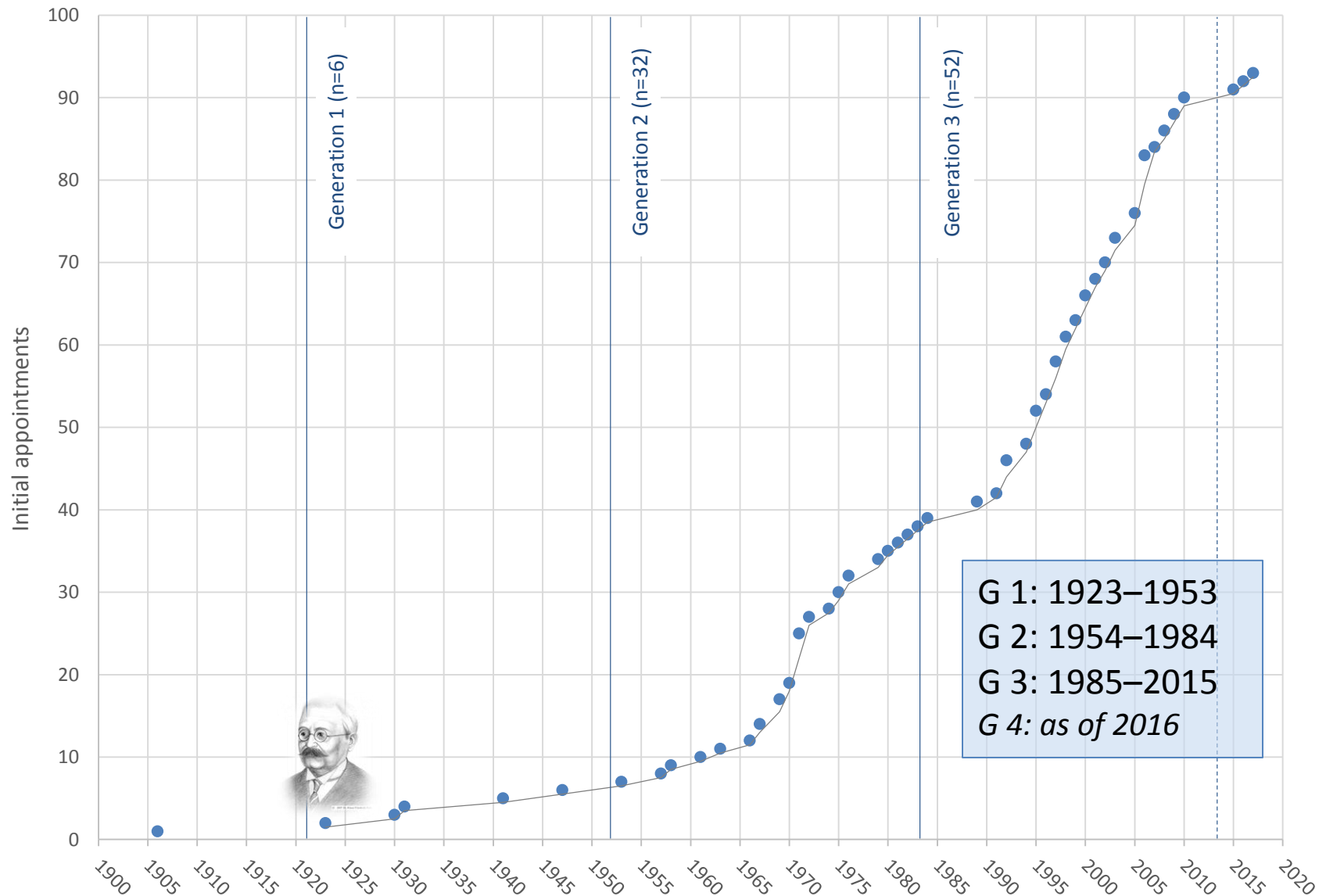
e. g. Jürgen van Buer (*1949), Detlef Sembill (*1950) & Tade Tramm (*1953)

Generation 4

...

Prof. Dr. Jürgen Zabeck (* 1931 – † 2014) was Professor of Business Education of the Higher Pedagogical Institute of Berlin (1969), of the Free University of Berlin (1969–1972) and the University of Mannheim (1972–1997).

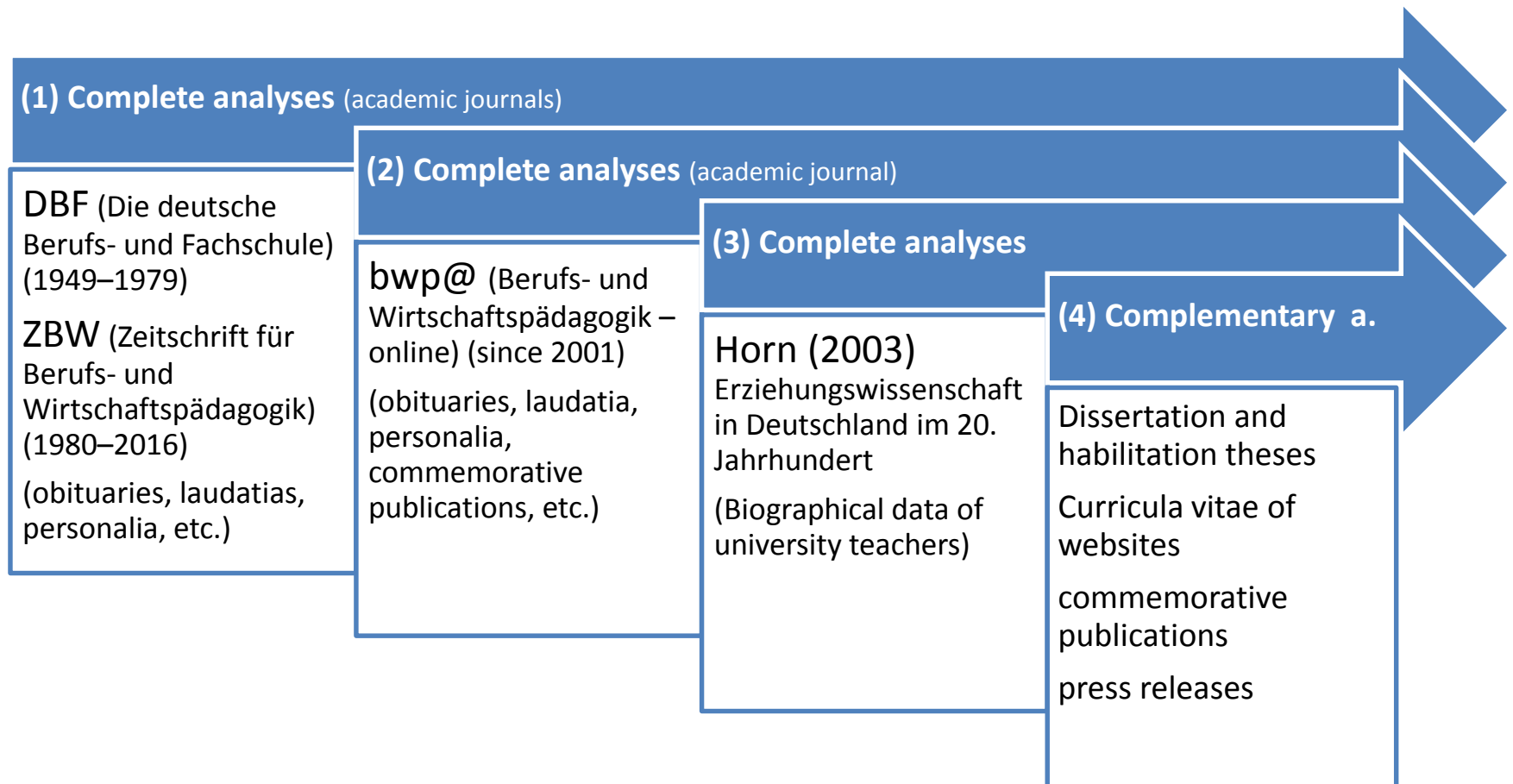
Cumulative initial appointments of BE professors 1906-2016 (n=93)



Source: Own presentation based on the collective-biographical data set (status: Sept. 2017)

Data collection strategy

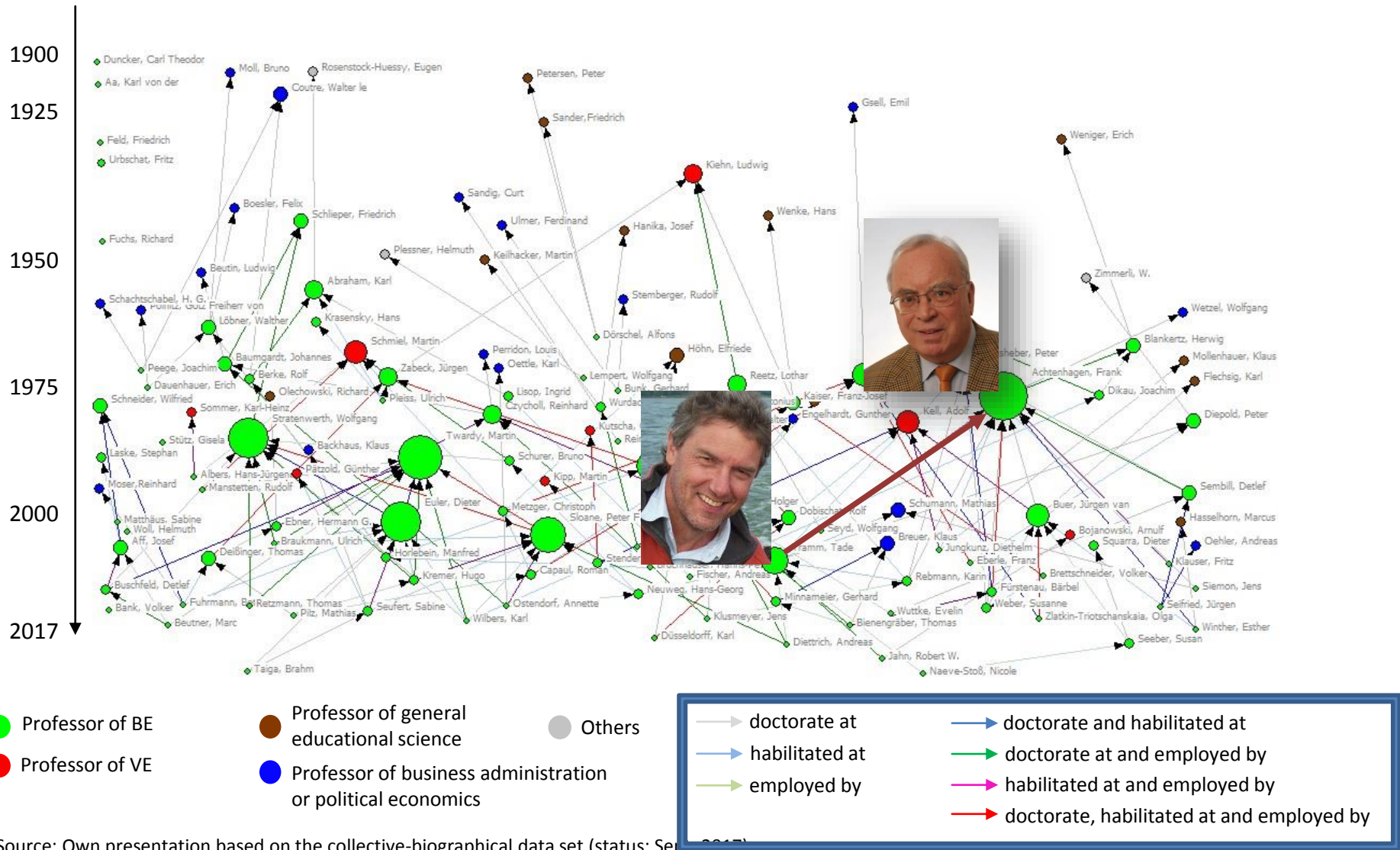
The personal data was obtained from publicly accessible documents (N=175).



Data preparation

(📖 Schröder, 2011; Stegbauer & Rausch, 2013; Trappmann, Hummell & Sodeur, 2005)

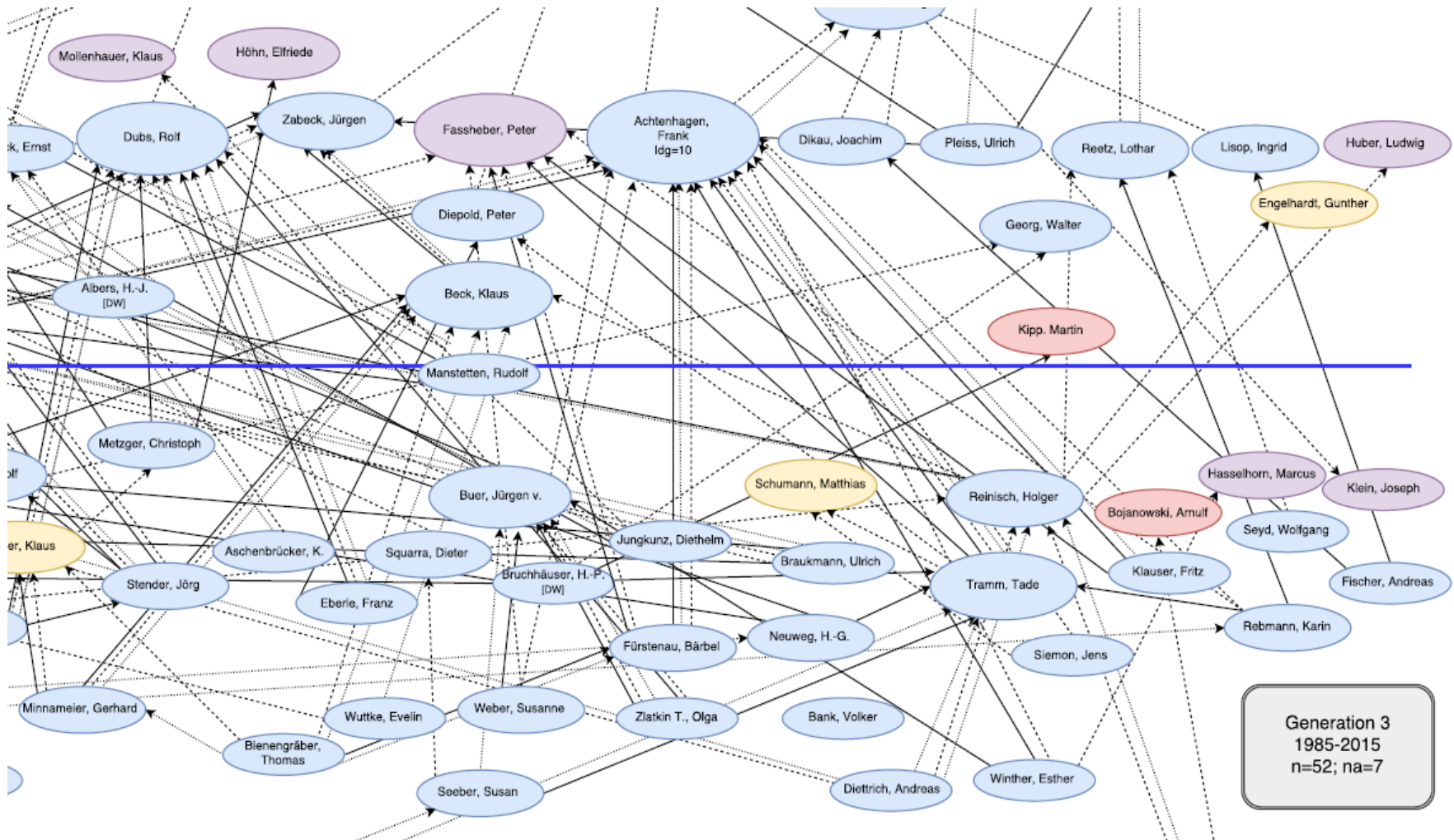
NetDraw-plot of the network of BE professors (N=139)



Source: Own presentation based on the collective-biographical data set (status: September 2017)

Data preparation

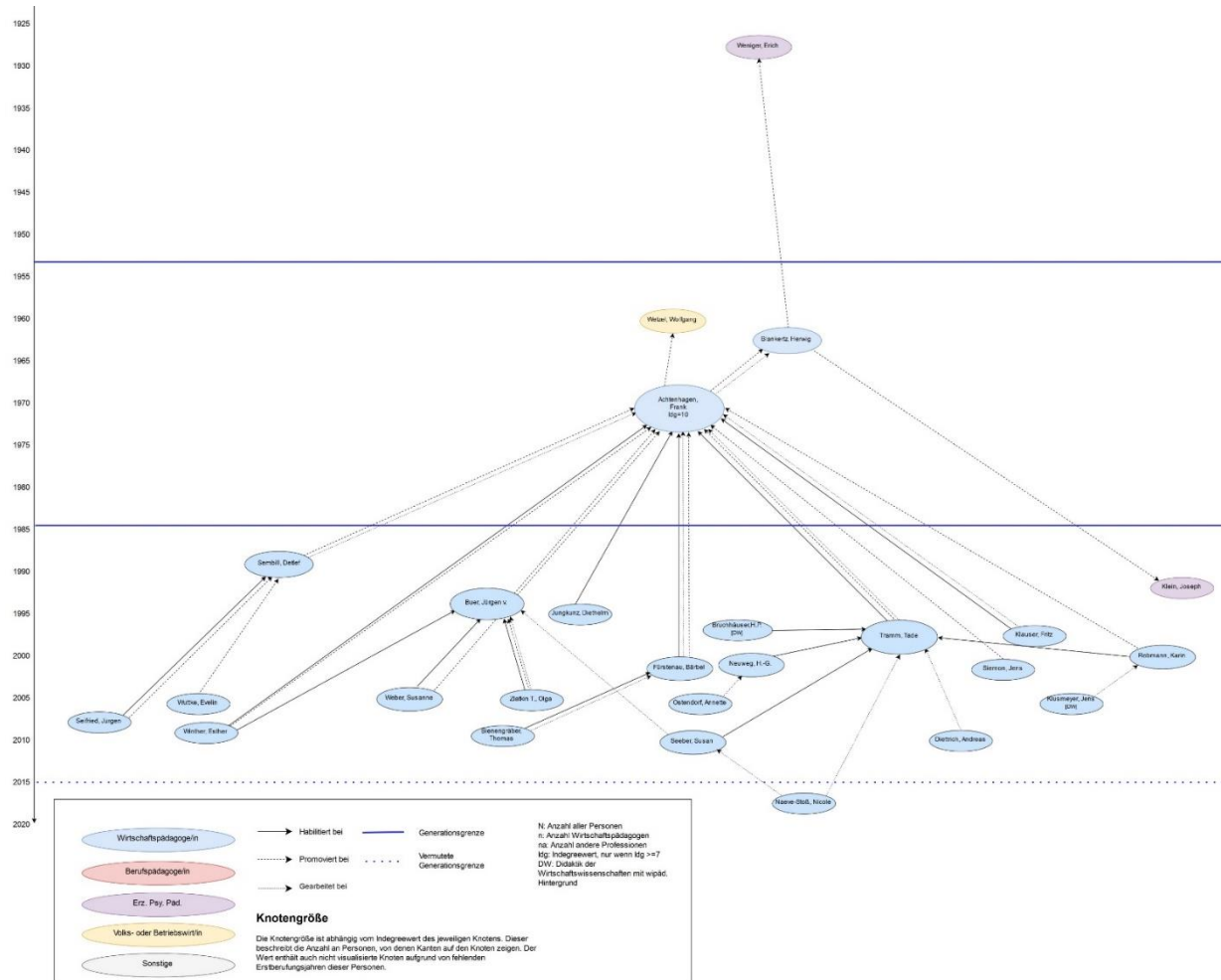
Excerpt of the optimized network of BE professors with draw.io (N=139)



Source: Own presentation based on the collective-biographical data set (Status: Sept. 2017)

Exemplary verification of data and network quality on the ego network of Frank Achtenhagen (per interview)

Status: before validation



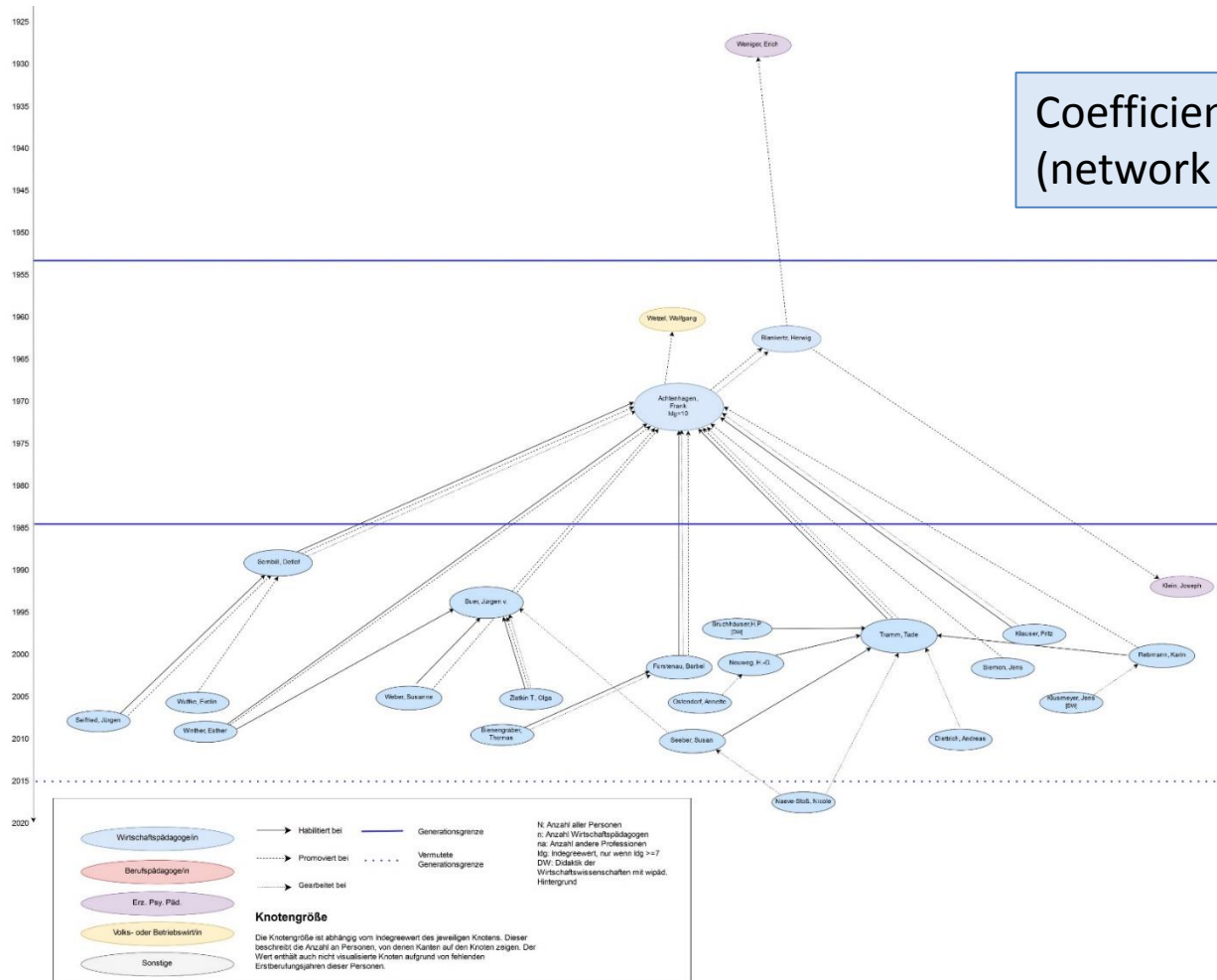
Prof. (em.) Dr. Dr. h. c. mult. Frank Achtenhagen (* 1939) was Professor of Business Education and head of the research area of Business Education of the University of Göttingen (1971–2007).

Exemplary verification of data and network quality on the ego network of Frank Achtenhagen (per interview)

Status: after validation



Coefficient of conformity (network relations): 99.95 %



Prof. (em.) Dr. Dr. h. c. mult. Frank Achtenhagen (* 1939) was Professor of Business Education and head of the research area of Business Education of the University of Göttingen (1971–2007).

Some preliminary results

Verification of hypothesis H1 over generations (G1-G3)

(H1) In the progressing establishment process, the number of BE professors increases.

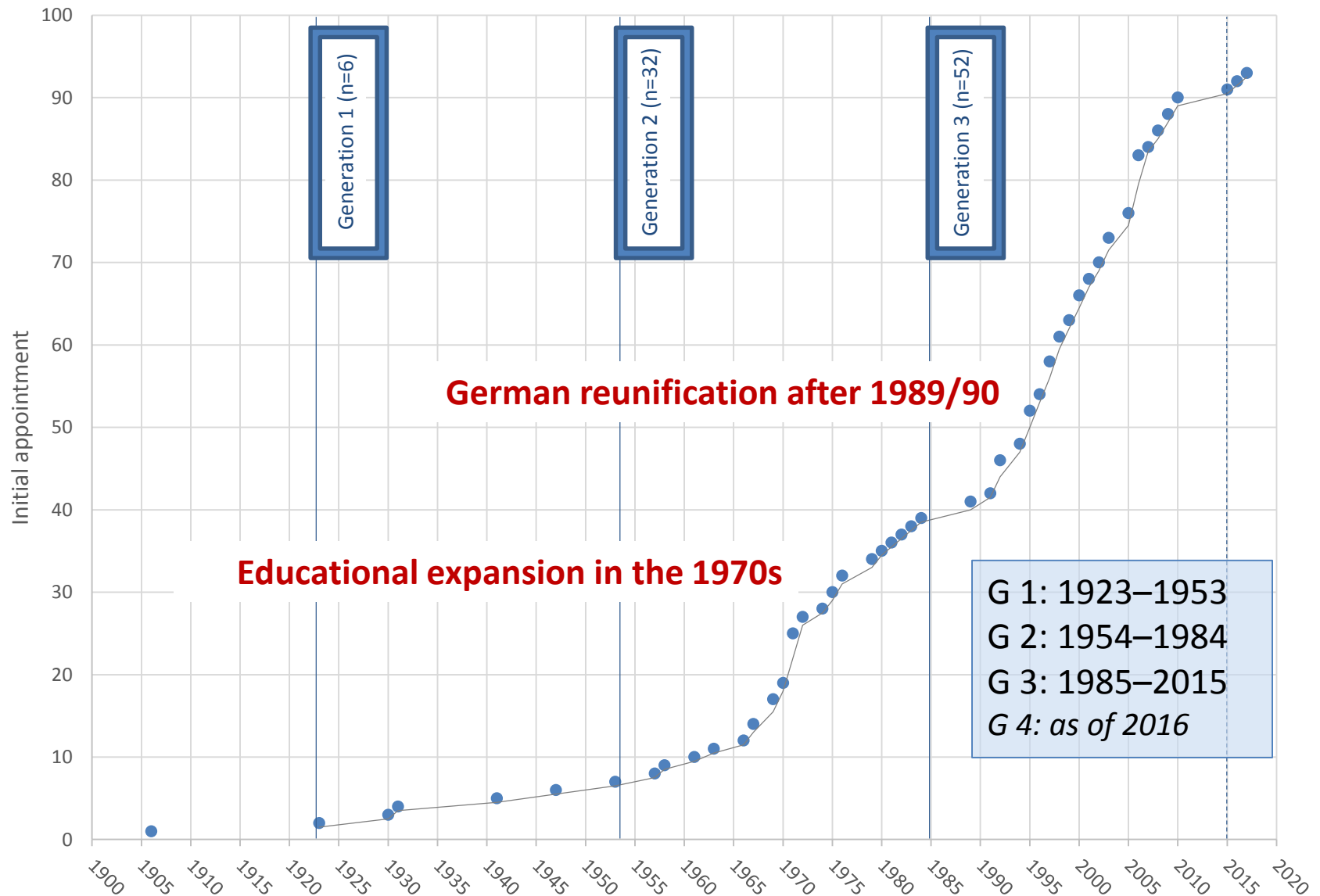
(H2) In the progressing establishment process, the initial appointment age of the BE professors decreases.

(H3) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases.

(H4) In the progressing establishment process, the relative share of non-discipline professors who are in qualification and/or employment relationships with professors of the BE decreases.

(H5) ...

Cumulative initial appointments of BE professors 1906-2016 (n=93)



Some preliminary results

Verification of hypothesis H3 over generations (G1-G3)

- (H1) In the progressing establishment process, the number of BE professors increases.
- (H2) In the progressing establishment process, the initial appointment age of the BE professors decreases.
- (H3) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases.**
- (H4) In the progressing establishment process, the relative share of non-discipline professors who are in qualification and/or employment relationships with professors of the BE decreases.

Some preliminary results


Verification of hypothesis H3 over generations (G1-G3)

(H3) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases.

| Generation | Number of BE professors | Sum Indegree | Average Indegree |
|----------------|-------------------------|--------------|------------------|
| G1 (1923-1953) | 6 | 5 | 0,8 |
| G2 (1954-1984) | 32 | 78 | 2,4 |
| G3 (1985-2015) | 52 | 52 | 1,0 |

Average Indegree of the Professors of BE (by generations), Source: Collective-biographical data set (status: Sept. 2017)

Some preliminary results

Limitation of the establishment period of BE (according to  Clark, 1972) over generations (G1-G3)

| Hypotheses | G1 (1923-1953) | G2 (1954-1984) | G3 (1985-2015) |
|---|-------------------|-------------------|--------------------|
| (H1) In the progressing establishment process, the number of BE professors increases. | X | ✓ | ✓ |
| (H2) In the progressing establishment process, the initial appointment age of the BE professors decreases. | X | ✓ | (✓) rel. stable |
| (H3) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases. | X | ✓ | (✓) expectable |
| (H4) In the progressing establishment process, the relative share of non-discipline professors who are in qualification and/or employment relationships with professors of the BE decreases. | X | X | ✓ |

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Netzwerk-BWP



Startseite

Neue Person anlegen

→ create new person

Person bearbeiten

→ edit person

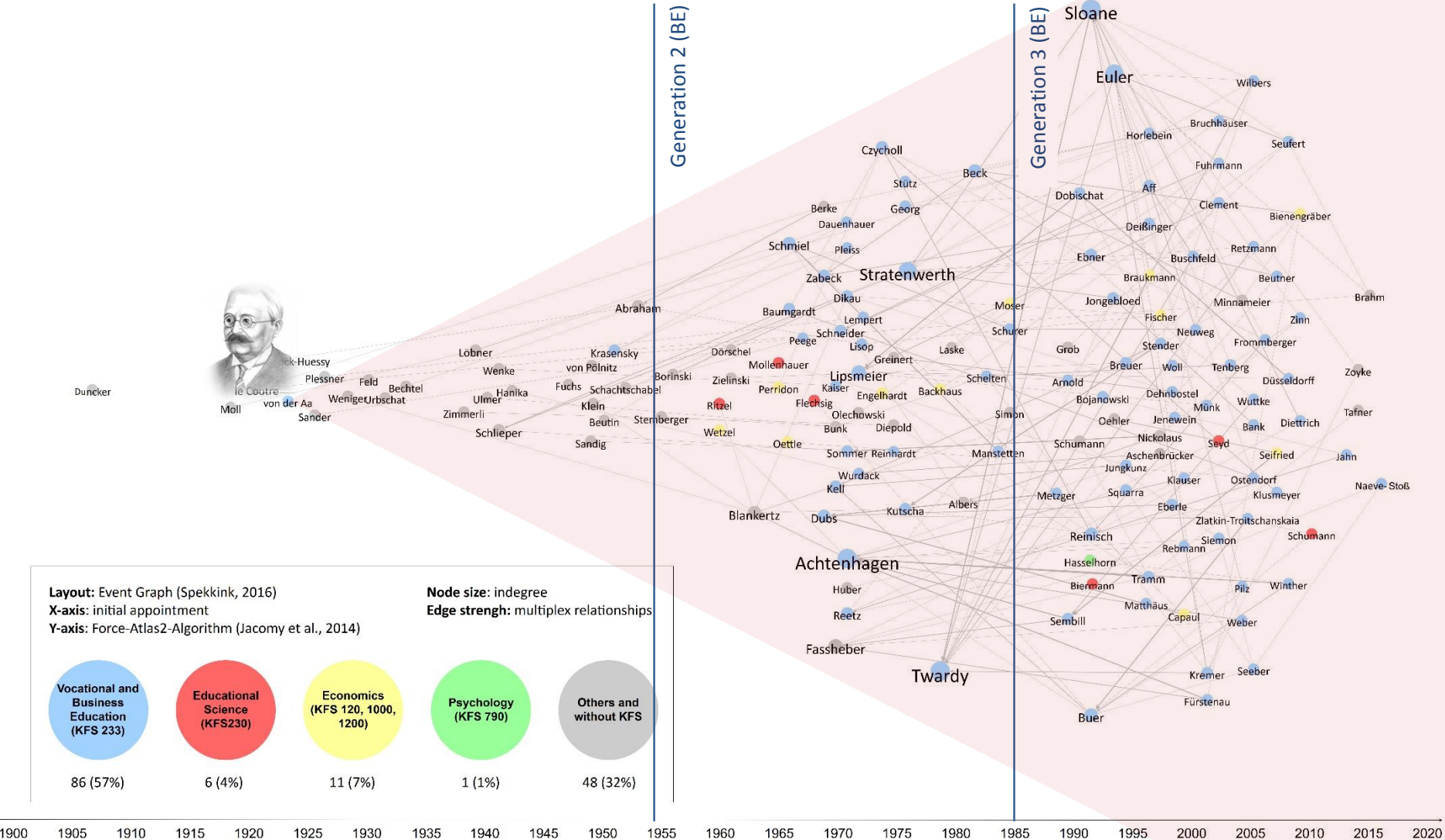
Person suchen

→ search person

Network of Professors of Vocational and Business Education (1906/23 – 2017), work in progress

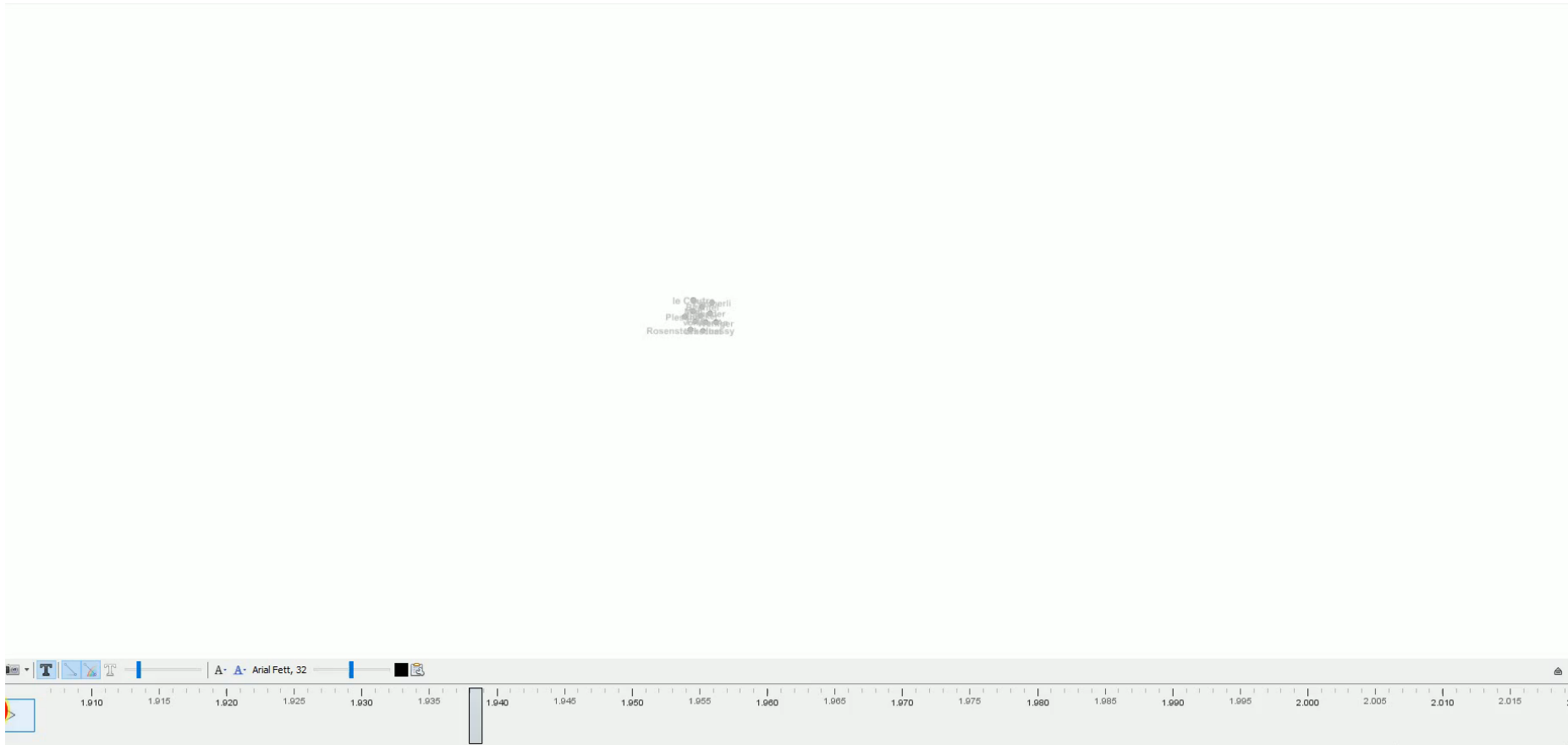
Employment and/or qualification relationships (SQL.E001.Promo.Habil.WB.Ges and SQL.N001.Stamm.Erst.Ges, DB-Stand: 25.04.2019)

N=151 Classification by scientific disciplines by Kürschner's Almanac of German Scholars (KFS)



Cologne school of business education

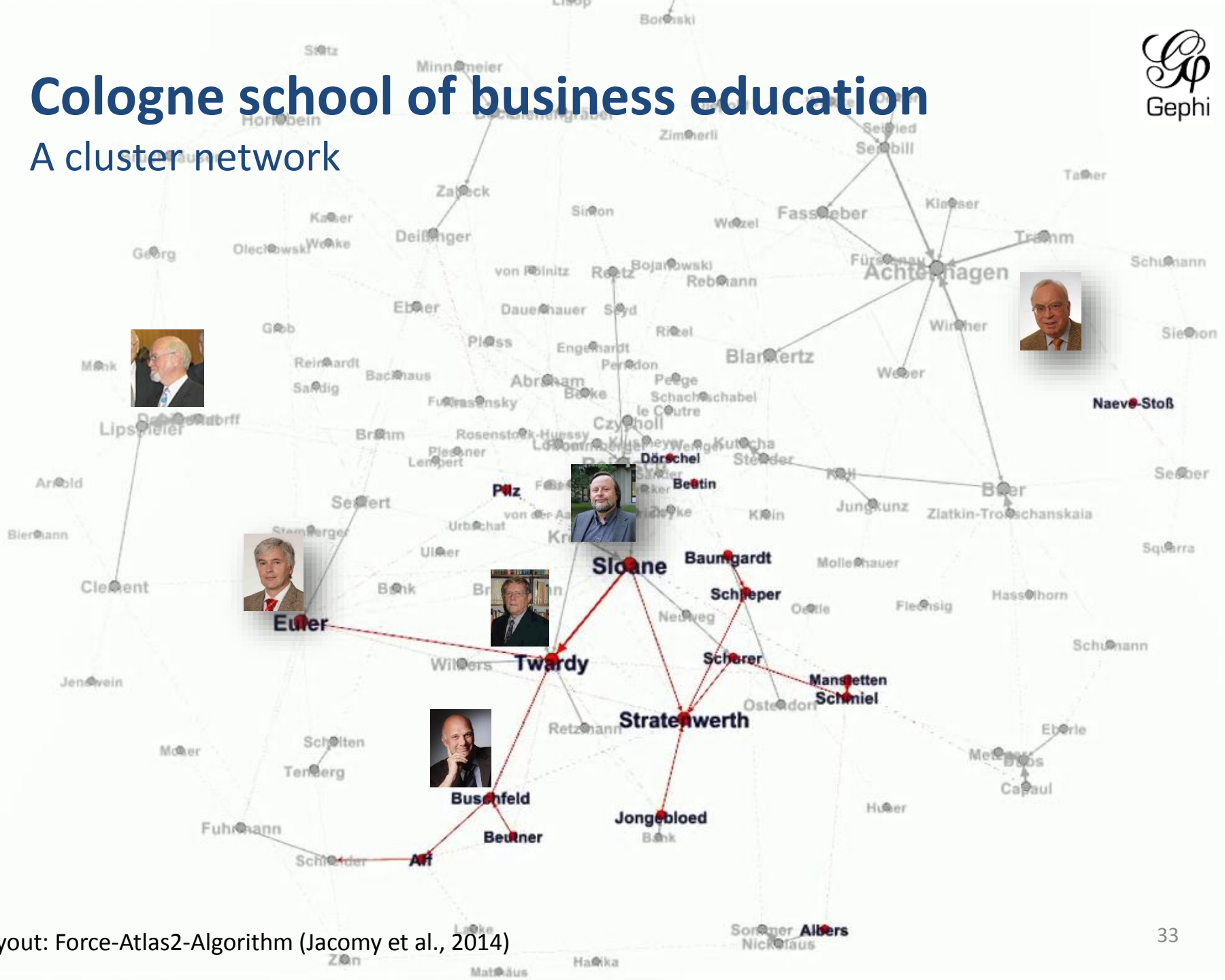
A cluster network



Layout: Force-Atlas2-Algorithm (Jacomy et al., 2014)

Cologne school of business education

A cluster network

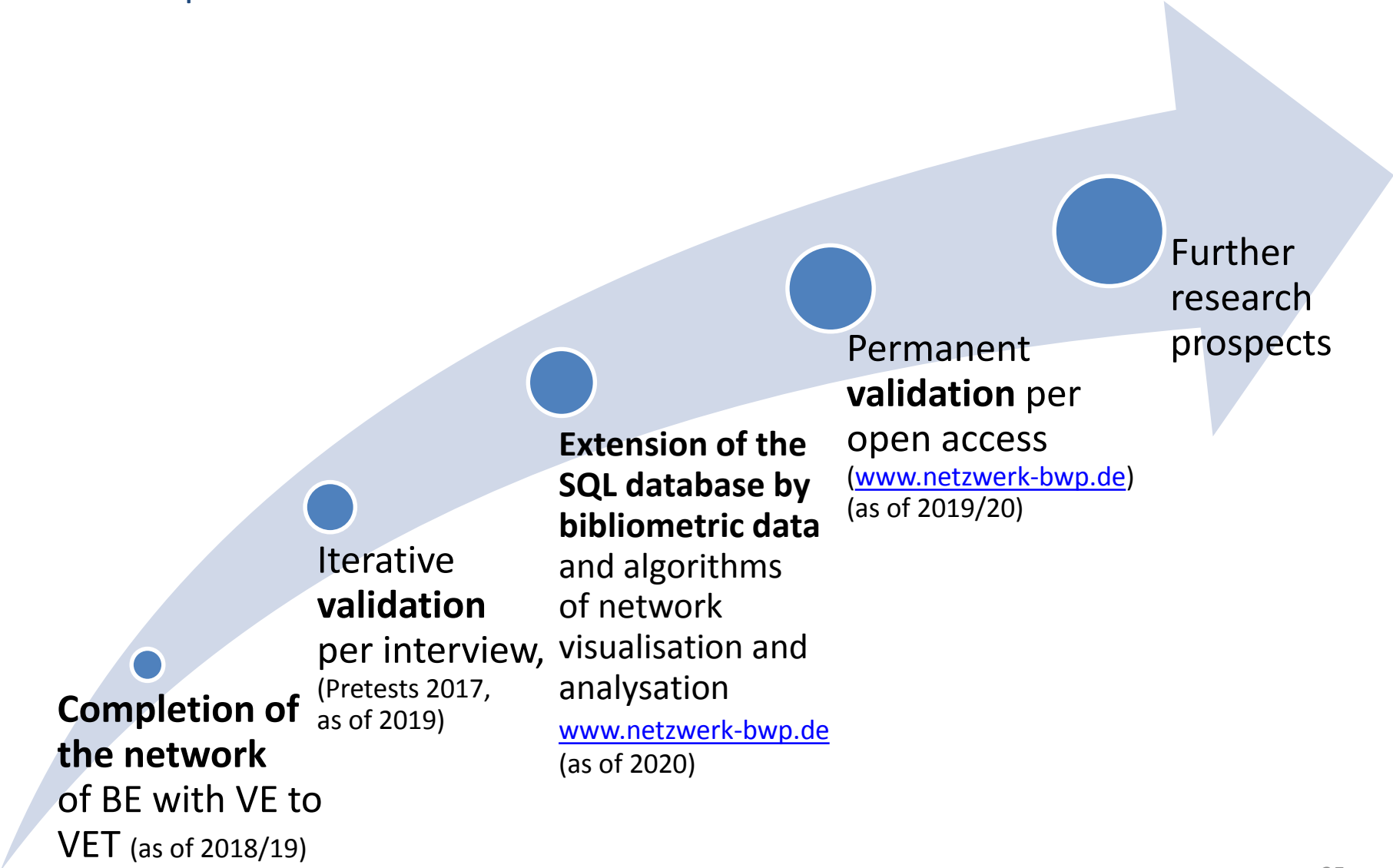


Structure

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Research prospects

Next steps



**Completion of
the network**
of BE with VE to
VET (as of 2018/19)

**Iterative
validation**
per interview,
(Pretests 2017,
as of 2019)

**Extension of the
SQL database by
bibliometric data**
and algorithms
of network
visualisation and
analysis
www.netzwerk-bwp.de
(as of 2020)

**Permanent
validation per
open access**
(www.netzwerk-bwp.de)
(as of 2019/20)

**Further
research
prospects**

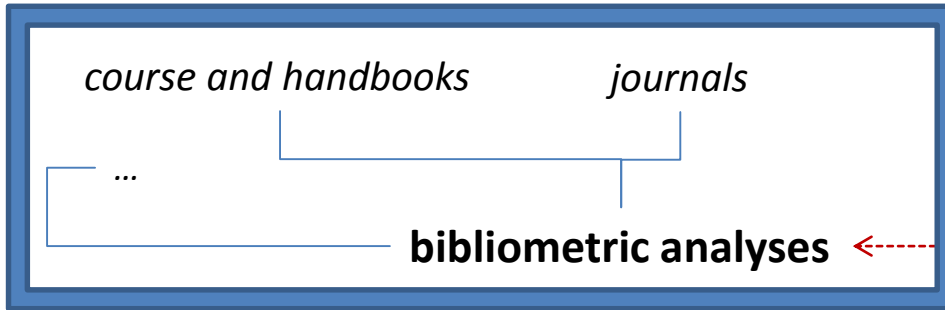
Research prospects

A sketchy overview of a bottom-up approach

SURVEYORS OF RESEARCH



→ **paradigms and paradigm-shifts**



quantitative

collective biographical and network analyses

discourse analyses

qualitative

VET

educational science

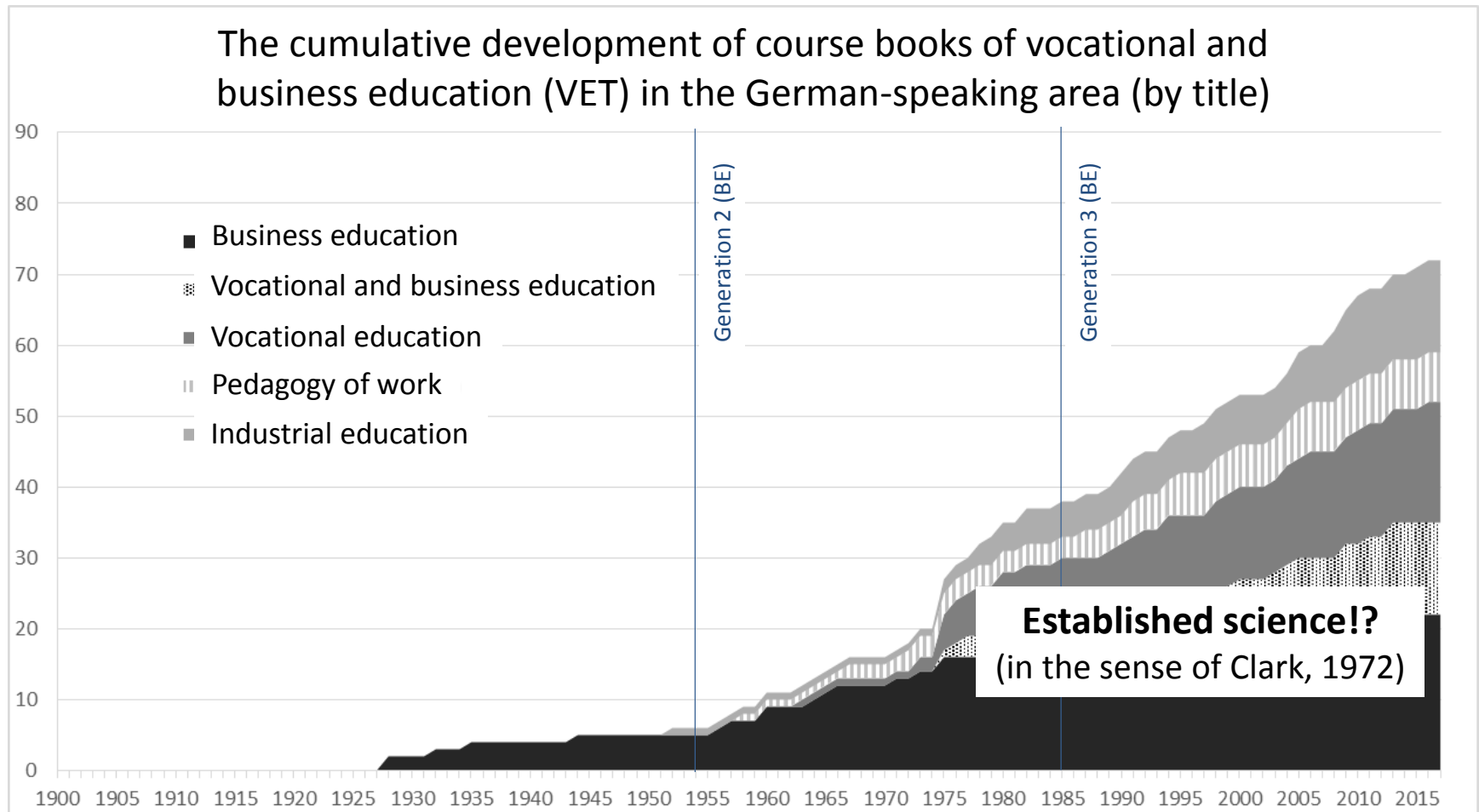
biographical research

interviews with scientists

analyses of study programmes

Research prospects

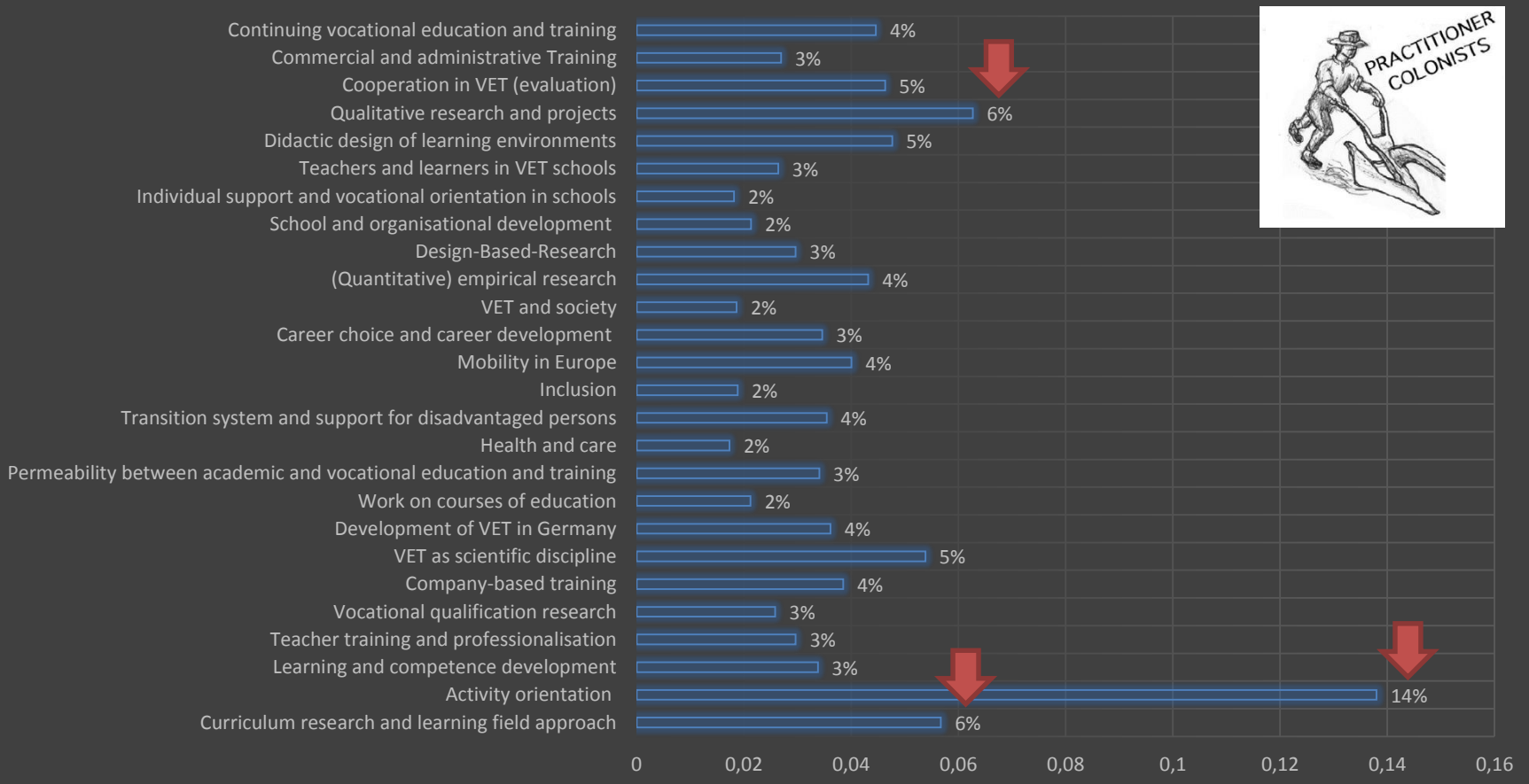
VET in the mirror of course books (*work in progress*)



Research prospects

VET in the mirror of journals *(work in progress)*

Share of 26 key topics in bwp@ - German VET online journal
A computer linguistic content analyses 2001 - 2018 (N=631 articles)



Research prospects

An interview with Frank Achtenhagen (*work in progress*)

‘One of the main questions is, who is involved in empirical research.’

(Achtenhagen, 2019, Interview, 18.01.2019)

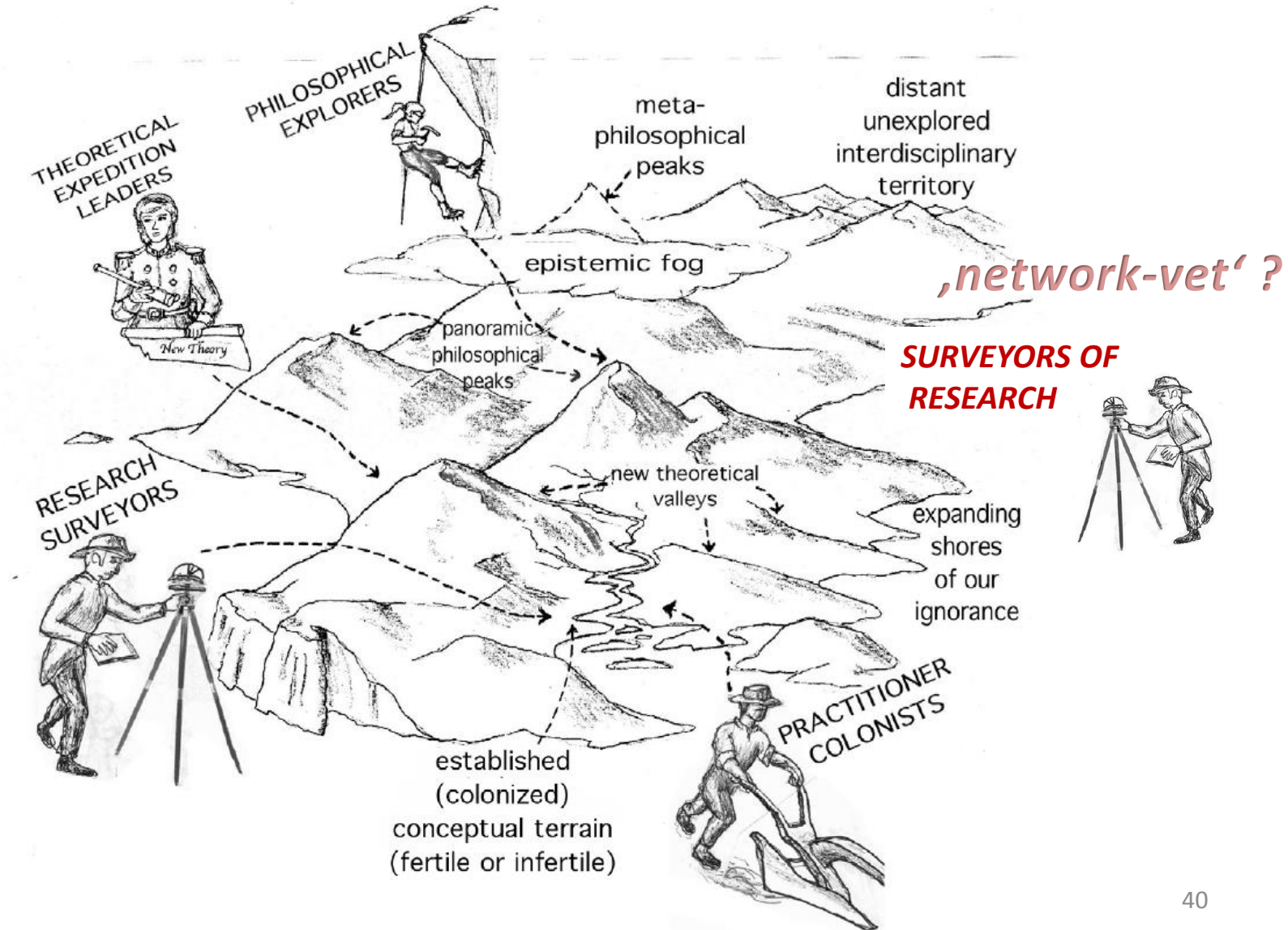
‘The isolation from the empirical branch isn't good. [...] You can't do research well, if you cut yourself off from the developments in neighbouring disciplines.’

(Achtenhagen, 2019, Interview, 18.01.2019)



Science of VET as an island continent?

Levels of analyses in an academic discipline portrayed metaphorically as exploration of an island continent (📖 Ambrose et al., 2010)



Thank you for your attention!

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Many thanks also to my colleagues
from 'netzwerk-bwp'!



Prof. Dr. Robert W. Jahn
(University of Magdeburg)



Patrick Geiser
(University of Göttingen)



Hannah Frind
(University of Rostock)



Thomas Driebe
(University of Marburg)

Universität
Rostock



Traditio et Innovatio



Institut für
Berufspädagogik

netzwerk-bwp

References I

- Ambrose, D., Tassel-Baska, J. v., Coleman, L. J. & Cross, T. L. (2010). Unified, Insular, Firmly Policed, or Fractured, Porous, Contested, Gifted Education? *Journal for the Education of the Gifted*, 33 (4), 453-478.
- Clark, T. N. (1974). Die Stadien wissenschaftlicher Institutionalisierung. In P. Weingart (Eds.), *Wissenschaftssoziologie 2. Determinanten wissenschaftlicher Entwicklung* (pp. 105-121). Frankfurt a. M.: Athenäum Fischer.
- Clark, T. N. (1972). The Stages of Scientific Institutionalization. *International Social Science Journal*, 24 (4), 658-671.
- Felt, U., Nowotny, H. & Taschwer, K. (1995). *Wissenschaftsforschung: Eine Einführung*. Frankfurt a. M.: Campus.
- Fleck, L. (¹¹2017). Entstehung und Entwicklung einer wissenschaftlichen Tatsache. Einführung in die Lehre von Denkstil und Denkkollektiv. Frankfurt a. M.: Suhrkamp.
- Götzl, M., Geiser, P., Jahn, R. W. & Frind, H. (2018). The Academic Professionalisation of Business Education as a Science – A Collective-Biographical and Network-Analytical Study of Discipline Formation in the German-speaking Area in the 20th Century. In L. M. Herrera, M. Teräs & P. Gougoulakis (Eds.), *Comparative Issues and Research Concerns in the National Landscapes of Vocational Education & Training* (pp. 99–125). Stockholm: premiss.
- Götzl, M., Geiser, P. & Jahn, R. W. (2018). Zur Institutionalisierung der Berufs- und Wirtschaftspädagogik im 20. Jahrhundert. Ein kollektivbiographischer und netzwerkanalytischer Beitrag zur Etablierung der Wirtschaftspädagogik als (erziehungs-)wissenschaftliche (Teil-)Disziplin. In K. Vogel, C. Bers, J. Brauns, A. Hild, A. Stisser & K.-P. Horn (Eds.), *Wendungen und Windungen in der Erziehungswissenschaft. Empirische Studien* (pp. 107–122). Bad Heilbrunn: Klinkhardt.
- Horlebein, M. (2009). *Wissenschaftstheorie. Grundlagen und Paradigmen der Berufs- und Wirtschaftspädagogik*. Baltmannsweiler: Schneider.
- Jansen, D. (³2006). *Einführung in die Netzwerkanalyse Grundlagen, Methoden, Forschungsbeispiele*. Wiesbaden: VS.
- Kuhn, T. S. (²⁴2014). *Die Struktur wissenschaftlicher Revolutionen*. Frankfurt a. M.: Suhrkamp.
- Kuhn, T. S. (1962). *The Structure of Scientific Revolutions*. University of Chicago. Press.
- Lange, U., Harney, K., Rahn, S. & Stachowski, H. (2001). *Studienbuch Theorien der beruflichen Bildung: Grundzüge der Diskussion im 20. Jahrhundert*. Bad Heilbrunn: Klinkhardt.
- Luhmann, N. (1992). *Die Wissenschaft der Gesellschaft*. Frankfurt a. M.: Suhrkamp.

References II

- Reinisch, H. (2010). Geschichtsschreibung und Disziplinbildung – Anmerkungen zur Funktion der frühen Historiographie des kaufmännischen Bildungswesens im Prozess der Etablierung der Wirtschaftspädagogik als Wissenschaft. In E. Wuttke & K. Beck (Eds.), *Was heißt und zu welchem Ende studieren wir die Geschichte der Berufserziehung? Beiträge zur Ortsbestimmung an der Jahrhundertwende* (pp. 181-199). Opladen: Budrich.
- Reinisch, H. (2009). Über Nutzen und Schaden des Philosophierens über das Selbstverständnis der Berufs- und Wirtschaftspädagogik – Anmerkungen aus wissenschaftssoziologisch inspirierter Sicht. *bwp@ Berufs- und Wirtschaftspädagogik – online*, 16, 1-17.
- Schröder, W. H. (2011). *Kollektivbiographie als interdisziplinäre Methode in der Historischen Sozialforschung: Eine persönliche Retrospektive*. Köln: Zentrum für Historische Sozialforschung.
- Stegbauer, C. & Rausch, A. (2013). *Einführung in NetDraw. Erste Schritte mit dem Netzwerkvisualisierungsprogramm*. Wiesbaden: Springer.
- Stichweh, R. (2013). *Wissenschaft, Universität, Professionen. Soziologische Analysen*. Bielefeld: transcript Verlag.
- Stichweh, R. (1984). *Zur Entstehung des modernen Systems wissenschaftlicher Disziplinen. Physik in Deutschland 1740 – 1890*. Frankfurt a. M.: Suhrkamp.
- Trappmann, M., Hummell, H. J. & Sodeur, W. (2005). *Strukturanalyse sozialer Netzwerke. Konzepte, Modelle, Methoden*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Zabeck, J. (2006). *Zur Ambivalenz der Fortschrittsidee in der Berufs- und Wirtschaftspädagogik*. Vortrag im Rahmen der Ringvorlesung „Grund- und Zeitprobleme der Wirtschaftspädagogik“. Mainz.
- Zabeck, J. (2009). *Geschichte der Berufserziehung und ihre Theorie*. Paderborn: Eusl.