Center for Quality Analysis (ZQA), University of Technology Dresden, Germany

Sunbelt 2019 – XXXIX Sunbelt Social Networks Conference of the International Network for Social Network Analysis (INSNA)

IMPACT EVALUATION BY USING RELATIONAL APPROACHES IN WEB SURVEYS

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Overview

1. Relevance & Research question(s)

2. Theoretical framework

3. Case study

4. Summary & Conclusion

5. Discussion

1. Relevance & Research question(s)

Impact evaluation in higher education

Conversion of the European Higher Education Area and Bologna Process

**Quality Assurance Processes → Accreditation procedure →
Evaluation of the effectiveness of study and teaching → Outcomes**

1. Relevance & Research question(s)

Digitalization in higher education

technological access – organizational structures – didactical aspects – legal issues – cultural change

New challenges for impact evaluation

1. Relevance & Research question(s)

➡ **What does (digital) education actually achieve?** → skills & <u>structure</u>

- • "What are the basic conditions in higher education (technological, organizational, didactical)?"

➡ **How effective is (digital) education?** → competencies & employability

- • How the system <u>support</u>s organizational, technological, and didactical implementations?

➡ **How we can measure the effectiveness of (digital) education?**

- • What does digital methodologies (actually) do for that? And which instruments can be implemented for <u>context evaluation</u>?

Potential for using network approaches in evaluation
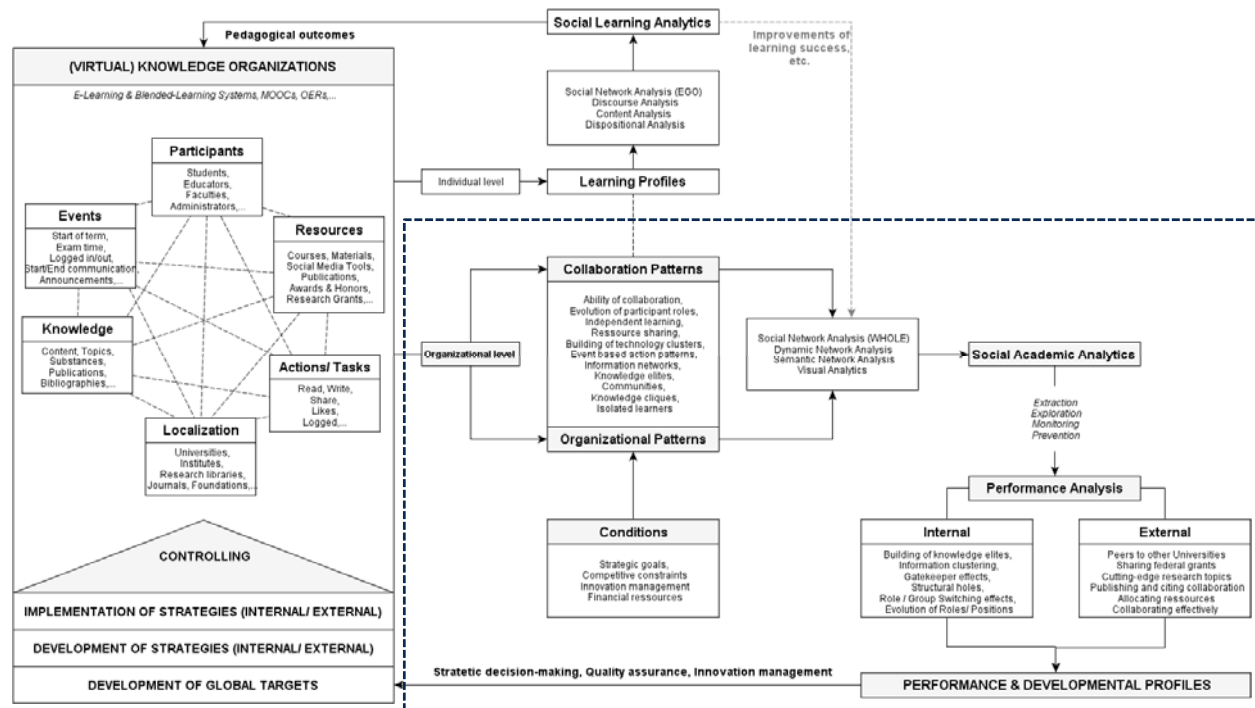
2. Theoretical framework

Fig 1. Social Academic Analytics: A Theoretical Framework in Social Academic Analytics in Higher Education. In: Stuetzer, Breiger, & Köhler 2013 & 2016 at Social Media 2013 - International Education Technology Conference, Hong Kong & Sunbelt 2016, Brighton, UK.

2. Theoretical framework

**»Who (or what) is connected to whom (or what)
by which channels in which time
with <u>what effects</u>?«**

(Lazarsfeld et al.,1944; Lasswell, 1948; Carley, 2003; Contractor, 2009)

3. Case study

1

Implementation of semantic network analytics
What semantic network analytics can do for impact evaluation of education? → analyzing open-ended questions in web surveys for exploring conditions of education (e.g. extraction of expectations on competencies & skills) → function of evaluation & questions of efficiency

2

Integrating network instruments in web surveys
How we can implement network instruments to measures the impact of (social) conditions? → to contextualize support structures (services etc.) to measures the effectiveness to enhancing e.g. mentoring

Network approaches to "qualify" the outcome of quantitative data

Students' survey (n (Testbeds)=800, 4 universities & 3 selected subject areas (computer science, maths, educational sciences)

➡ **Respondents**
- 196 students (180 exploitable)

3. Case study

Insights in support structures

➡️ **Respondents (n=127)**

Who *says* what to whom by which channel with what effect?

(1) who → Respondent (Ego → ID)
(2) what → Topics (f12→ f13a (study); f13b (private))
(3) to whom → Roles/ Characteristics of roles (Alteri → f13a_1/f13a_2)
(4) which channel → Types of support (f13a_5; f13a_6)
(5) what effect → Dropouts and Non-dropouts in comparison (f18)

**...to explore the link between the structure
of social support and potential (non-)dropouts**

Do they seek advice? Which topics do they discuss? (who/what)

11. In case of questions, problems or worries concerning your studies, how often do you ask for support?* (for f11= 5-> further with f14)

1 always	2 most of the time	3 from time to time	4 rarely	5 never
O	O	O	O	O

12. How often do you discuss the following issues in this regard?* (only for f11=1;2;3;4)

	1 always	2 most of the time	3 from time to time	4 rarely	5 never
issues concerning study and exam organization	O	O	O	O	O
subject-specific issues and contents	O	O	O	O	O
personal issues (incidents, problems, fears, worries)	O	O	O	O	O
general issues (experience, future, career entry, etc.)	O	O	O	O	O

f13a Topic network „study-related"

f13b Topic network „private-related"

13a / 13b

And which topics do they discuss <u>with whom</u>? (what/ to whom)

13. With whom do you discuss these issues?

- **13a. Now, when you think of the three people with whom you talk about** <study-related issues (study and examination organisation, subject-related questions and content)> **most frequently, ...** <mark>(nur für 12_1/12_2=1;2;3;4)</mark>

  - **...who comes to your mind <u>first</u>?** *Please provide details about this person.*

  - **...who comes to your mind <u>second</u> (concerning study-related issues)?** *Please provide details about this person.*

  - **...who comes to your mind <u>third</u> (concerning study-related issues)?** *Please provide details about this person.*

➡ Support network of EGO „study-related" topics

And which topics do they discuss <u>with whom</u>? (what/to whom: T2)

13. With whom do you discuss these issues?

- **13b. Now, when you think of the three people with whom you talk about** <personal issues (incidents, problems, fears, worries, experiences, goals) within the context of study> most frequently,... <mark>(nur für 12_3/12_4=1;2;3;4)</mark>

    - ...*who comes to your mind <u>first</u>? Please provide details about this person.*

    - ...*who comes to your mind <u>second</u> (concerning study-related issues)? Please provide details about this person.*

    - ...*who comes to your mind <u>third</u> (concerning study-related issues)? Please provide details about this person.*

➡ Support network of EGO „private-related" topics

How the person is related to the respondent? (role of Alteri)

13a_1. To do so, first state this person's the kinship or relationship to you. (Dropdown)

☐	**father, mother**
☐	**brother, sister**
☐	**son, daughter**
☐	**grandfather, grandmother**
☐	**husband, wife, civil partner, boyfriend or girlfriend**
☐	**friend**
☐	**acquaintance**
☐	**other related person or in-laws** (grandchild, uncle, aunt, nephew, niece, father-in-law, mother-in-law, son-in-law, daughter-in-law, brother-in-law, great-grandfather, great-grandmother, great-grandchild)
☐	**other <u>non</u>-related person**

Alteri
(support of EGO)

	Structure of social support on higher education (by topics)	
	Topics network „study-related" _n=127 **(2)** Topics (f12→ f13a; f13b) **(3)** Roles (Alteri → f13a_1)	**Topics network „private-related" _n=97** **(2)** Topics (f12→ f13a; f13b) **(3)** Roles (Alteri → f13a_1)
n	9	8
l	51	42
lw(min)	1	1
lw(max)	49	43
D	0,67	0,69
	Contacts within „study-related" topics network n= Contacts of respondents during advice seeking l= common nominations of EGO (max. 3 contacts)	**Contacts within „private-related" topics network** n= Contacts of respondents during advice seeking l= common nominations of EGO (max. 3 contacts)
Degree central. (DC)		

	Structure of social support on higher education (by topics)	
	Topics network „study-related" _n=127 (2) Topics (f12→ f13a; f13b) (3) Roles (Alteri → f13a_1)	**Topics network „private-related" _n=97** (2) Topics (f12→ f13a; f13b) (3) Roles (Alteri → f13a_1)
n	9	8
I	51	42
lw(min)	1	1
lw(max)	49	43
D	0,67	0,69
	Contacts within „study-related" topics network n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)	**Contacts within „private-related" topics network** n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)
Betweeness central. (BC)		

Effects on potential (non-)dropouts

18. At this current stage in your studies, are you seriously considering...

	Yes	No
... changing your major or program?	☐	☐
... changing college or university?	☐	☐
... temporarily taking a break from the study program?	☐	☐
... completely giving up your studies?	☐	☐

Dropouts (n=26)

	Structure of social support on higher education (by Dropouts/ Non-Dropouts)	
	Dropouts_n=22 (by role) (5) EGO→ `r18`	**Non-Dropouts_n=82 (by role)** (5) EGO→ `r18`
n	7	9
I	28	52
lw (min)	2	1
lw (max)	45	148
D	0,67	0,72
	Contacts within „dropouts" network n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)	**Contacts within „non-dropouts" network** n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)
Authority central. (AC)		

	Structure of social support on higher education (by Dropouts/ Non-Dropouts)	
	Dropouts_n=22 (by role) **(5) EGO→** `f18`	**Non-Dropouts_n=82 (by role)** **(5) EGO→** `f18`
n	7	9
I	28	52
lw (min)	2	1
lw (max)	45	148
D	0,67	0,72
	Contacts within „dropouts" network n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)	**Contacts within „non-dropouts" network** n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)
Betweeness central. (BC)		

Network instruments

13a_1. To do so, first state this person's the kinship or relationship to you. (Dropdown)

☐	father, mother
☐	brother, sister
☐	son, daughter
☐	grandfather, grandmother
☐	husband, wife, civil partner, boyfriend or girlfriend
☐	friend
☐	acquaintance
☐	other related person or in-laws (grandchild, uncle, aunt, nephew, niece, father-in-law, mother-in-law, son-in-law, daughter-in-law, brother-in-law, great-grandfather, great-grandmother, great-grandchild)
☐	**other non-related person**

Alteri
(support of EGO)

?

13a_2. Please also state this person's relationship to you within the context of study.

Multiple answers are accepted.

☐	fellow student
☐	teaching staff, lecturer
☐	mentor, supervisor
☐	chief, head
☐	employee, colleague
☐	student advisor
☐	psychosocial consultant
☐	other
☐	none

Characteristics of Alteri

	Structure of social support on higher education (by dropouts/ non-dropouts & by role in study context)	
(5)	**Dropouts_n=22 (by role)** **(5)** EGO→ r18 **(3)** Role (Alteri → f13a_1) **(3)** Role in the study context (Alteri →f13a_2)	**Non-Dropouts_n=82 (by role)** **(5)** EGO→ r18 **(3)** Role (Alteri → f13a_1) **(3)** Role in the study context (Alteri →f13a_2)
n (role)	7	9
n2 (role2)	9	21
I	20	45
lw (min)	1	1
lw (max)	44	157
D	0,32	0,24
	Contacts within „dropouts" network by role in study context n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)	**Contacts within „non-dropouts" network by role in study context** n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)
Degree central. (DC)	 Cluster of formal roles	 Cluster of switching roles

4. Summary & Conclusion

- Support structures don't seem to be explained by the choice of topics
- Beyond friends, parents and spouses & partners the repertoire of contacts differs between non- & dropouts network
  - "other non-relates" (dropouts) vs. "other relates & in-laws" (non-dropouts) gaining influence
- Different facets of weak ties seem to have different impact on the need for support
  - formal vs. informal roles & switching contacts
- Formal roles in academic context important for advice seeking, BUT interpretation unclear (neg or pos)
  - Neg → A1 (assumption): Formal advisory structures / services fail (e.g. student counselling, psychosocial counselling) → don't prevent potential drop outs
  - Pos → A2 (assumption): Formal advisory structures / services have a positive effect → Advice and support on study orientation and identification → e.g. switching the degree program because of non-matching interests/skills/competencies

4. Summary & Conclusion

Potentials for network approaches in impact evaluation

- New methodologies → new insights
- Possibility of evaluation of e.g. support structures and (relational) conditions of "target groups" (students, teachers, etc.) → **function** of evaluation
- Understanding **different facets of structures and roles** within (academic) contexts and their impact e.g. on (non-)dropouts
- Supporting "**context evaluation"** for impact evaluation
  - Learning is contextual & situativ → behavioural analytics
  - Academic system based on high variety and diversity → complex structure of impact factors

But the interpretation needs (actually)

more information about the <u>situative context</u> of students!

Further methodological approaches

5. Discussion

**Do you have questions, comments
and/or suggestions?**

TECHNISCHE
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für Bildung
und Forschung

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Thanks for your attention!

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* Board member German Society for Online Research (DGOF)
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* New publication: Stuetzer, C. M., Welker, M., & Egger M. (Eds.) (2018): Computational Social Science in the Age of Big Data. Neue Schriften zur Online-Forschung, (15) Köln: Herbert von Harlem

Appendix

Network instruments

13a_1. To do so, first state this person's the kinship or relationship to you. (Dropdown)

☐	**father, mother**
☐	**brother, sister**
☐	**son, daughter**
☐	**grandfather, grandmother**
☐	**husband, wife, civil partner, boyfriend or girlfriend**
☐	**friend**
☐	**acquaintance**
☐	**other related person or in-laws** (grandchild, uncle, aunt, nephew, niece, father-in-law, mother-in-law, son-in-law, daughter-in-law, brother-in-law, great-grandfather, great-grandmother, great-grandchild)
☐	**other <u>non</u>-related person**

→ Alteri
(support of EGO)

13a_2. Please also state this person's relationship to you within the context of study.

Multiple answers are accepted.

☐	fellow student
☐	teaching staff, lecturer
☐	mentor, supervisor
☐	chief, head
☐	employee, colleague
☐	student advisor
☐	psychosocial consultant
☐	other
☐	none

→ Characteristics of Alteri

13a_3. Please specify the gender of this person. (Dropdown)

☐	male
☐	female
☐	diverse
☐	prefer not to answer

➡ Characteristics of Alteri

13a_4. Please specify the age of this person. (Dropdown)

☐	older than me
☐	about the same age
☐	younger than me
☐	prefer not to answer

➡ Characteristics of Alteri

13a_5. Please indicate in which way you most frequently communicate on issues of study and examination organization with this person. (Dropdown)

☐	rather personal (face-to-face)
☐	rather by telephone (including video telephony)
☐	rather in digital form (for example chat, mail, forums)

➡ Characteristics of Alteri

Network instruments

Over all persons: ➡ Density in topic networks

13a_8. If you think of the three people you have just named, please state whether you think they are also communicating with each other.

☐	Everyone is communicating with each other.
☐	Two of the named persons are communicating with each other.
☐	None of the named persons are communicating with each other.
☐	I can't tell.

What kind of support are they looking for in the study context?

13a_6. In which way does this person support you on the issues of study and examination organization?
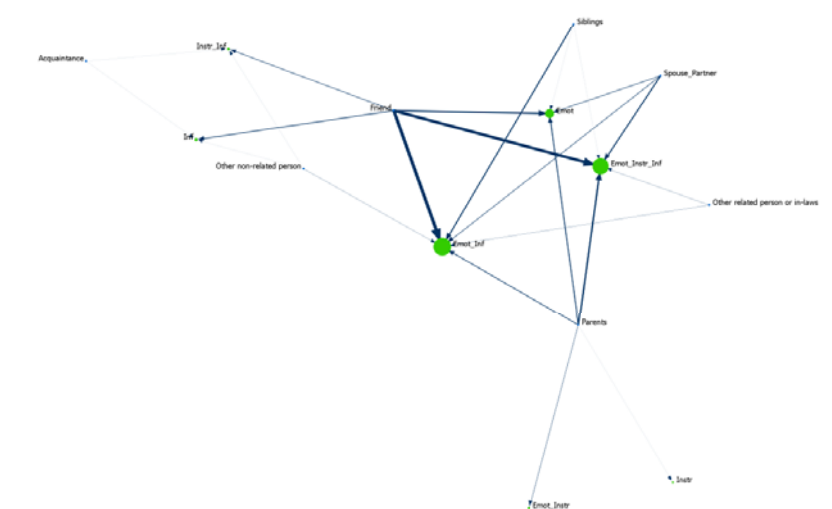
Multiple answers are accepted.

☐	He/she supports me emotionally (for example during exam stress, to pour out my heart, to reflect my current situation more efficiently).
☐	He/she supports me instrumentally (for example by providing materials, tutoring, financial support, etc.).
☐	He/she supports me with providing information (for example advice, suggestions and/or other information).

➡ Emotional support

➡ Instrumental support

➡ Informational support

13a_7. In this regard, how often have you been in contact with this person during the last semester - whether in person, by telephone or by e-mail?

☐	daily
☐	several times a week
☐	once a week/several times a month
☐	about once a month
☐	less frequent

	Structure of social support on higher education (by dropouts/ non-dropouts & by role in study context)	
(5)	**Dropouts_n=22 (by role)** **(5)** EGO→ f18 **(3)** Role (Alteri → f13a_1) **(4)** Types of support (Alteri → f13a_6)	**Dropouts_n=82 (by role)** **(5)** EGO→ f18 **(3)** Role (Alteri → f13a_1) **(4)** Types of support (Alteri → f13a_6)
n	42	116
N (sets)	3	3
I	98	463
lw (min)	1	1
lw (max)	238	5974
D	0,24	0,3
	Contacts within „dropouts" network by types of support n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)	**Contacts within „non-dropouts" network by role in study context** n= Contacts of respondents during advice seeking I= common nominations of EGO (max. 3 contacts)
In-Degree central. (DC)		

4. Summary & Conclusion

1 **Revising instruments**

2 **Overall testing in larger contexts**
  • to be carried out in different contexts

3 **Outline the theoretical foundations**
  • for application in other discipines

Plea for integrating network approaches in applied science