Development of positive and negative knowledge in a professional community

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EARLI 2011, Exeter UK
no indications in think-aloud protocols
Domains where negative knowledge apply

• Mathematics and logic
  – negative evaluation of two propositions
  – together with positive knowledge it is part of the same database

• Law
  – negative know-how; can be considered a commodity and the property of a business

• Education and lifelong learning
  – Life is always more complex that law and logic
Negative knowledge in LLL and education

Gartmeier, Bauer, Gruber and Heid (2008):

- negative knowledge is learned from errors
“The concept of negative knowledge augments existing theories of professional knowledge by emphasizing knowing about what to avoid as part of experts’ effective actions. During routine actions, negative knowledge enhances professionals’ certainty of how to proceed and increases the efficacy through the avoidance of impasses and suboptimal problem-solving strategies. Quality and depth of reflective processes after actions are related to the development of negative knowledge.”
Issues

- Dichotomy?
- Part of the same knowledge base?
- Individual or group process?
Research questions

• What kind of pre-existing knowledge is required and what kind of errors is required for building negative knowledge?

• Is negative knowledge an end-product or is it ‘just’ a step in further knowledge building?
Method

• Case study in ‘the’ medical community
  – Community, hospitals, northern hemisphere

• Topic: Development of positive and negative knowledge on Lyme’s disease (borreliose)
Results

Time line

- 1975: outbreak in Old Lyme, Connecticut
- 1983: identification of spirochete in ticks’ stomach by Burgdorfer
Results

Time line

• 1880 – 1940: endemic in Europe; unsystematic descriptions of symptoms complexes; indications about the role of ticks (vector)

• 1930: Hellerstrøm of Karolinska hypothesised a spirochete as causal factor

• 1950: antibiotics work but have mixed effects (as in syphilllus and in tuberculosis)

• 1975: outbreak in Old Lyme, Connecticut

• 1983: identification of spirochete in ticks’ stomach by Burgdorfer

Positive and/or negative knowledge?

• Little knowledge about complex issues
Groups involved

Physicians

Epidemiologists

Biomedical researchers

Literature

patients
Results - 2

• Epidemiology:
  – Percentage of affected ticks, percentage of infection, percentage showing/seeing EM

• Multi-system

• The big ‘impersonator’

• Three-staged: early, mid and late

• Type of diagnosis
  – History! Clinical plus lab
  – Lab turned out problematic
Yearlong observations

http://www.natuurkalender.nl/toepassingen/teken/teken_wn.asp

Open Universiteit
www.ou.nl
Results - 3

- Evidence-based protocols

- BUT stable situation was of short duration, if it ever happened
  - 2 conflicting theories/communities
  - More stakeholders: insurance companies
## Conclusions

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Conclusion

- Community or individual?
- Positive/negative

- Awareness of not-knowing and dealing with uncertainty transcends the positive/negative dichotomy, and is probably a stronger driver for knowledge development.
Finally

- Poor research?

Thank you