Networked Learning Analytics
Studying the Association between Learner Generated Discourse and Learning

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Dimensions of NLA

Structure

cMOOC study 1

xMOOC study

Dynamics

cMOOC study 2

Discourse
Context

- Open design
- Learner centered
- Use of social media
- Distributed communication

- Fixed design
- Focused on learner-content
- Interaction
- Video lectures
- Peer assessment
cMOOC Study 1

1. Language and social capital

2. Social media affordances?
1. Language and social centrality?

2. Language and learning outcome?

xMOOC Study
cMOOC Study 2

- Automated content analysis
- Social network analysis
cMOOC Study 1 - Method

CCK11 (12 weeks)

Week 1
Learner 1
Learner 2
Learner N

Week 2
Learner 1
Learner 2
Learner N

Week N

CCK12 (12 weeks)

1755 posts
2483 posts
1473 posts

1473 posts
61 posts
2266 posts
624 posts

SNA
Degree centrality
Eigenvalue centrality
Betweenness centrality
Closeness centrality

<<measure>>

<<analyze>>

Coh-Metrix
Narrativity
Syntactic Simplicity
Word Concreteness
Referential Cohesion
Deep Cohesion

MLM

1755 posts
2483 posts
1473 posts
61 posts
2266 posts
624 posts

Method
Slide 7 of 16
xMOOC Study - Method

NGIx (8 weeks)

Degree centrality
Betweenness centrality
Closeness centrality

SNA

Learner 1
Learner 2
...
Learner N

Coh-Metrix

Active learners
MLM
All learners

Narrativity
Syntactic Simplicity
Word Concreteness
Referential Cohesion
Deep Cohesion

Active learners
MLM
All learners
Grades
## cMOOC 1 and xMOOC Study Results

<table>
<thead>
<tr>
<th></th>
<th>Negative (significant)</th>
<th>Positive (significant)</th>
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<tbody>
<tr>
<td><strong>Social Centrality/Social Capital</strong></td>
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<tr>
<td>cMOOC</td>
<td>Referential Cohesion</td>
<td>Narrativity</td>
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<td>Syntax Simplicity</td>
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<td>xMOOC (all learners)</td>
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<td><strong>Performance</strong></td>
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</table>
cMOOC Contextual factors

- **Media**
  - Twitter vs. Facebook vs. Blogs
    - Differ in their affordances

- **Time**
  - Negative association?

- **Activity**
  - More active -> more likely to grow influence
cMOOC 1 and xMOOC Study Findings

Contextual, as well as linguistic and discourse features of written artefacts, are important determinants of learning in a MOOC environment.

- **cMOOC:**
  - The language and discourse used by learners’ with more social capital has a more conversational style

- **xMOOC:**
  - Better performance – more expository style discourse
  - Higher centrality – more narrative style, with less overlap between words and ideas
Further work

• Explore the dynamics of the network interactions

• Rely on statistical (instead of mathematical) models
  – Reveal underlying social processes
  – Effect of homophily

• Learner properties
  – Learners with the same/similar characteristics tend to collaborate more often?
cMOOC Study 2 - Method

• Semantic annotation of learners’ posts and recommended readings
  – TagMe
  – AlchemyAPI

• Creation of concept co-occurrence graphs
  – 36 undirected weighted graphs

• Clustering of concepts into topics
  – Structure and cohesiveness

• Similarity of learner generated posts and recommended readings
cMOOC Study 2 - Findings

Connectivism as a learning theory
- Connectivism,
- Social media,
- Emergence,
- ...

Connectivism in practice
- Collaboration,
- Knowledge,
- Thought,
- ...

Educational technology
- E-learning,
- Complex adaptive system,
- edtech,
- ...

Social network,
Networked learning,
Social group,
...

Networked learning
Further work

• Topic modeling
  – Improve the algorithm
    • Improve filtering
    • Mixed Membership Stochastic Blockmodels (MMSB)

• Social component
  – Implement State Transition Topic Models
  – Transition over communities
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Q&A

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References

