

## Network Analysis of Knowledge Construction in Asynchronous Learning Networks

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The use of Asynchronous Learning Networks (ALN) makes the process of collaboration more transparent, as a transcript of conference message can be used to assess both the collaborative process itself, and the role and contribution of the individual to the process. We consider three aspects of ALNs: the design; the quality of resulting knowledge construction process; and the cohesion, role and power network structures. The design is evaluated according to the Social Interdependence Theory of Cooperative Learning. The quality of the knowledge construction process is evaluated through content analysis. The network structures are analyzed using Social Network Analysis of the response relations between participants during online discussions.

In this research we analyze recorded data of two three-month-long ALNs of academic University courses: a formal, structured, closed forum and an informal, non-structured, open forum.

We found that in the structured ALN. The knowledge construction process reached a very high level of critical thinking and developed a mesh of cohesive interconnected cliques. The students took on bridging and triggering roles, while the tutor had relatively little power. In the non-structured ALN, the knowledge construction process reached a low level of cognitive activity, few cliques were constructed, most of the students took on the passive role of teacher-followers, and the tutor was at the center of activity. These differences are statistically significant.

We conclude that a well-designed ALN develops significant, distinct cohesion, role and power structures that lead the knowledge construction process to high levels of critical thinking.

Key words: Asynchronous Learning Networks, Social Network Analysis, Cohesion Analysis, Role Analysis, Power analysis, Content Analysis