

Peer Production of Online Learning Resources

A Social Network Analysis

Beijie Xu and Mimi Recker, *Utah State University*



Instructional Architect



- A web-based application for teachers to freely find, gather, and produce instructional activities for their students.
- Teachers can share these resulting activities, called **IA projects**.

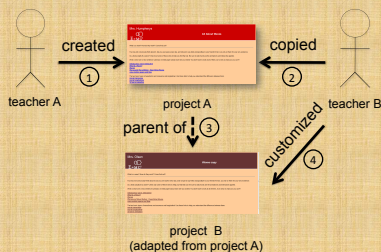


Teacher Interactions

View action



Copy action



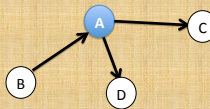
This material is based in part upon work supported by the National Science Foundation under Grant Number 0840745. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

IA Social Networks

directed, weighted networks



	View network	Copy network
nodes	teacher users	teacher users
arc	B viewed A's project(s)	B copied A's project(s)
weight	the number of times B viewed A's project(s)	the number of times B copied A's project(s)



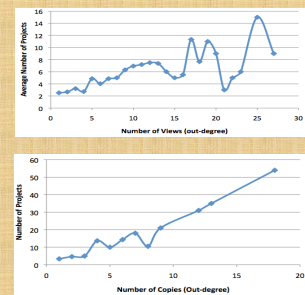
	View network	Copy network
in-degree	the number of users who have viewed user A's project	the number of users who have copied user A's project
out-degree	the number of users whose project(s) have been viewed by user A	the number of users whose project(s) have been copied by user A

Summary of the Two Networks

	# of in-degree		# of out-degree		# of viewers / copiers	# of viewees / copiees	# of users
	Avg	Max	Avg	max			
View Network	5.12	83	3.63	36	988	700	1283
Copy network	2.41	83	1.76	18	298	217	388

- The view network is much denser.
- From a user perspective, viewing represents an action with a much lower "cognitive" cost (a simple click) compared to a copy action (which represents a decision to use/adapt the content). The difference in cognitive cost is reflected in the much sparser copy network compared to the view network.

Project Creation, View, Copy



- The mean number of IA projects created initially increases as the number of views increases but then saturates except for a peak when out-degree = 25.
- The mean number of IA projects created does not saturate as a function of the number of copies and exhibits an increasing trend.
- The copy action appears to be a better metric for describing meaningful user's activity in the IA network, as opposed to the view action.

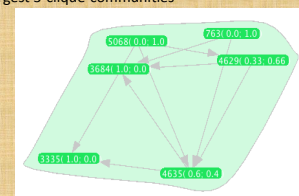
Clique Analysis

Clique: a subgraph in a network in which every two vertices are connected by an edge.

K-clique: a clique of k vertices.

K-clique-community: the union of all k-cliques that can be reached from each other through a series of adjacent k-cliques.

The largest 3-clique-communities



Cliques seem to correspond to teacher subject areas.

subjects	user IDs	763	3335	3684	4629	4635	5068
Language arts		x	x	x	x	x	x
Math			x	x	x	x	x
Science			x	x	x	x	x
Social studies			x	x		x	x