

Where in the World? Demographic Patterns in Access Data

Mimi Recker, Beijie Xu, Christine Garrard, *Utah State University*
Sherry Hsi, *Lawrence Hall of Science, UC Berkeley*



Web-based Educational Systems

Instructional Architect (IA)



- A tool for collecting and reusing online learning resources
- Utah-based
- Outreach program in New York and Michigan

Exploratorium Learning Resources Collection (ELRC)



- A digital library of over 700 science activities and instructional resources
- Based on a hands-on museum in California

Procedure

1. Track web metrics using Google Analytics.
2. Collect geo-referenced visits data.
3. Join and map geo-referenced data with public demographic datasets.
4. Analyze the association between the two.

Datasets

Geo-referenced data

- IA's Google Analytics report
- ELRC's Google Analytics report

Demographic data

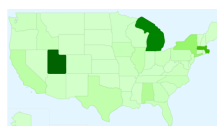
- Per capita income
- Median family income
- Number of schools
- Number of school districts
- Population

This material is based in part upon work supported by the National Science Foundation under Grant Number 840738 & 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.

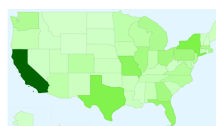
Highlights

- Collect geo-referenced data for two web-based educational systems.
- Map geo-referenced data with public demographic datasets.
- Conduct statistical analyses of these relationships to highlight significance predictor variables.

Visits from the Contiguous US



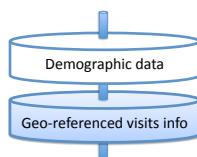
(a). Instructional Architect



(b). ELRC

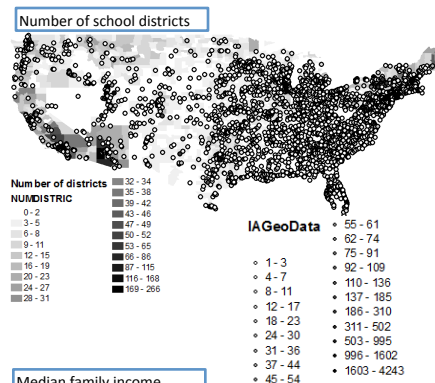
- Both groups were successful in local dissemination activities.
- The ELRC also showed more widespread U.S. visitors.

Mapping Data



State	State visits	City	City visits	County name	schools	school districts	per capita income	median family income
New York	2791	New York	670	NEW YORK	1451	30	42922	50229
California	8180	Los Angeles	596	LOS ANGELES	2837	97	26851	46452
Missouri	1354	Seymour	559	WEBSTER	17	5	14502	36934
Texas	2898	San Antonio	195	BEKAR	491	41	16351	43724
California	8180	San Francisco	185	SAN FRANCISCO	113	3	46556	63345
Pennsylvania	1784	Philadelphia	576	PHILADELPHIA	328	57	16509	37038
Florida	2228	Miami	165	MIAMI DADE	456	1	18477	40240
California	8180	Frederick	147	ALABAMA	410	27	26685	45857
Colorado	879	Boulder	146	BOULDER	99	3	28976	70572
Ohio	1472	Columbus	142	FRANKLIN	186	77	23951	31966
Illinois	1612	Chicago	141	COOK	1311	588	23227	51784
Indiana	769	Indianapolis	138	MARION	234	35	21789	49187
California	8180	Oakland	112	ALAMEDA	410	27	26685	45857
Pennsylvania	1784	Pittsburgh	329	ALLEGHENY	385	85	22891	49913
California	8180	Fresno	121	FRESNO	140	17	15495	38455
Florida	2138	Jacksonville	120	DUVAL	177	2	30751	47889
California	8180	Alameda	119	ALAMEDA	410	27	26685	45857
Texas	2696	Houston	111	HARRIS	174	72	21451	46064
California	8180	Lancaster	95	LOS ANGELES	2017	97	20683	46452
California	8180	San Jose	87	SONOMA	184	42	25724	61921

Mapping data (con't)



Statistical Analysis

- Used negative binomial regression to account for skewed data.
- Dependent Variable:
 - Number of visits
- Three independent variables:
 - Population
 - Number of school districts
 - Per capita income

	population	school districts	per capita income
	Wald chi-square	p-value	Wald chi-square
IA	190.18	.000	.63
ELRC	71.36	.000	6.96

- Population density significantly predicted number of online visitors.
- Per capita income also significantly predicted number of online visitors. This may be a function of the amount of resources (e.g., computers) available in the local schools and communities.