youthmappers

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HOW KNOWING THE PURPOSE OF MAPPING IMPACTS THE MAP AND MAPPERS THEMSELVES

Research Questions

The opportunity presented through the YouthMappers network of chapters to engage university students in authentic, open humanitarian mapping raises important questions about how to guide the quality and productivity of volunteer spatial contributions while providing a valuable learning experience. It presents the unique chance to pique new mappers' interest, satisfaction, and confidence in spatial technologies in particular, and technology in general. Moreover, connecting to the communities creating and using OpenStreetMap could pique interest in the people and places served by humanitarian mapping projects. Our study asks, what is the effect of sharing authentic contextual information about the purpose of humanitarian mapping tasks on new mappers' performance, motivation, and empathy?

Methodology

Beginner mappers, 42 students with no prior experience, were given the same location to map on OSM, organized into 2 groups where only one group was provided information about the location and humanitarian purpose of the task

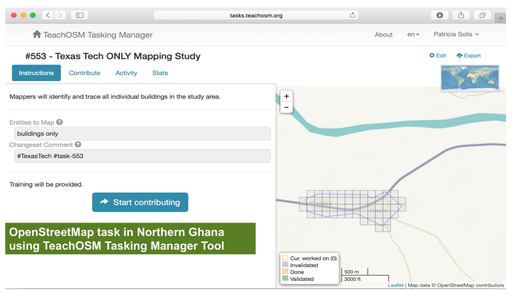
Gender and racial/ethnic demographics

Category	Number	Percentage of subjects[a]	Percentage enrolled Texas Tech University undergraduates
Male	22	52.4	53.7
Female	20	47.6	46.3
American Indian or Alaskan Native	1	2.4	0.5
Asian or Pacific Islander	1	2.4	2.6
Black or African American	5	11.9	7.1
Hispanic or Latino	10	23.8	29.4
White or Caucasian	27	64.3	59.0
Total persons	42		

[a]Percentages under race/ethnicity might not add to 100% due to respondents selecting multiple categories or unknown response. Texas Tech University comparison is for noninternational student body.
Sources: Study survey; Texas Tech University (2017).

Performance metrics observed on OSM tasks assessed changes to the map

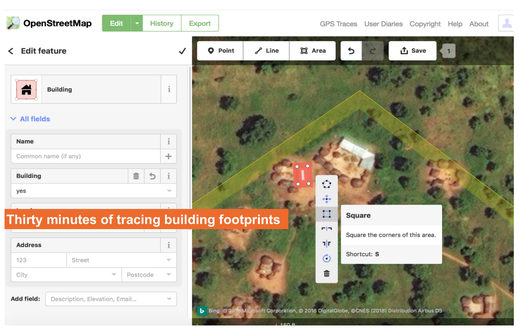
Productivity, Quality of Edits, Error Rates and Types



OpenStreetMap task in Northern Ghana using TeachOSM Tasking Manager Tool

Pre and post Likert surveys measured change in mappers

Awareness of Geospatial Careers, Interest, Satisfaction, Motivation, Confidence, Empathetic Affective Response



Performance measures and perceptions by group

Measure	Control group M	Control group SD	Informed group M	Informed group SD	t Score[a]
Productivity					
Change sets	6.89	2.85	5.96	2.58	1.091
Map changes	772	429	680	254	0.807
Buildings traced	73	33	70	24	0.284
Quality					
Total errors	41	26	31	22	1.039
Error types	5.44	2.77	7.21	3.08	1.947* $p = 0.0293$
Edit error rate	0.056	0.036	0.054	0.038	0.151
Feature error rate	0.610	0.486	0.520	0.359	0.657
Self-assessment					
Satisfaction[b]	3.5	1.3	4.7	0.6	3.570** $p = 0.00048$
Productivity[c]	3.2	0.9	3.8	0.4	2.884** $p = 0.00315$
Quality[d]	2.9	0.7	3.3	0.5	1.826* $p = 0.0378$

[a]$df = 40$.
[b]Overall, how satisfied are you with your mapping experience today? 5 = *very satisfied*, 4 = *somewhat satisfied*, 3 = *indifferent*, 2 = *somewhat dissatisfied*, 1 = *very dissatisfied*.
[c]How would you characterize your mapping productivity today? 4 = *very productive*, 3 = *somewhat productive*, 2 = *somewhat unproductive*, 1 = not productive at all.
[d]How would you characterize the quality of your mapping contributions today? I did 4 = *a very good job*, 3 = *a pretty good job*, 2 = *not do very well*, 1 = *poorly*.
*Significant at $p < 0.05$.
**Significant at $p < 0.01$.

Results

Informed mappers reported greater satisfaction, believed they mapped more edits, and thought their work was done better (but it was not)

Changes in Likert-scaled responses to mapping technologies within and across groups

Statement	Control group[a] Mean difference	Control group[a] Within-group t test (pre to post)	Informed group[b] Mean difference	Informed group[b] Within-group t test (pre to post)
I am confident in my ability to use technology	−0.056	0.37	0.208	−1.31
Technology on the whole is a benefit to society	−0.278	1.43	0.250	−2.01* $p = 0.028$
Technology on the whole is a detriment to society	−0.167	0.77	0.154	−0.17
I know how to explain the benefit of technology to society	−0.056	0.37	0.208	−1.10
I am interested in learning more about using technology in general for my career aspirations	−0.167	1.00	0.167	−1.07
Understanding technology will make me a stronger candidate for employment	−0.111	0.70	0.147	0.20
I have a good understanding of how to use mapping technologies	0.824	−2.2* $p = 0.021$	1.292	−6.07** $p < 0.0001$
I understand what is meant by geospatial data	0.222	−1.17	1.208	−4.28** $p = 0.0001$
I know how mapping could impact real communities	0.222	−1.29	1.167	−5.45** $p < 0.0001$
I am interested in learning more about using mapping technologies specifically for my career aspirations	0.118	0.16	0.826	−2.71** $p = 0.0006$

Notes: Responses are 5 = *strongly agree*, 4 = *agree*, 3 = *neither agree nor disagree*, 2 = *disagree*, 1 = *strongly disagree*.
[a]$df = 17$. [b]$df = 23$. *$p < 0.05$. **$p < 0.01$.

Humanitarian mapping might be a creative way to introduce general science and technology material to new students

Changes in Likert-scaled responses to self-reflection statements within and across groups

Response	Control group[a] Mean difference	Control group[a] Within-group t test (pre to post)	Informed group[b] Mean difference	Informed group[b] Within-group t test (pre to post)
Being a good citizen	−0.056	0.37	0.292	−2.60** $p = 0.008$
Social responsibility; giving back	0	0.00	0.208	−1.74* $p = 0.048$
Finding a well-paying job	−0.111	1.00	0.083	−0.81
Finding a rewarding job	0.028	1.28	0.069	0.57
Living a well-rounded, happy life	−0.072	1.10	0.042	−0.57

Notes: Responses are 4 = *extremely important*, 3 = *very important*, 2 = *somewhat important*, 1 = *not important*. Statements selected for use from the McGraw-Hill (2016) Workforce Readiness Survey.
[a]$df = 17$. [b]$df = 23$. *$p < 0.05$. **$p < 0.01$.

Informed mappers significantly changed their ideas about importance of being a global citizen and giving back after building the map

Changes in responses to empathy questions by group

Response statement	Control group ratio (post/pre)	Informed group ratio (post/pre)	Difference between group ratios	t Score
Positive empathetic response				
I find that I am "in tune" with other people's moods	0.994	1.083	−0.090	1.521
When I see someone being taken advantage of, I feel kind of protective toward him/her	0.993	1.041	−0.048	0.780
I have tender, concerned feelings for people less fortunate than me	1.038	1.015	0.022	0.377
I enjoy making other people feel better	1.003	0.976	0.026	0.446
When someone else is feeling excited, I tend to get excited, too	1.005	1.017	−0.013	0.331
I can tell when others are sad even when they do not say anything	1.019	1.040	−0.022	0.360
It upsets me to see someone being treated disrespectfully	0.996	0.983	0.013	0.302
I get a strong urge to help when I see someone who is upset	1.052	1.036	0.016	0.248
Lack of empathy response				
I am not really interested in how other people feel*	0.919	1.087	−0.168	2.291*
I become irritated when someone cries	1.165	1.021	0.144	1.351
I remain unaffected when someone close to me is happy	1.059	0.993	0.066	1.216
I do not feel sympathy for people who cause their own serious illnesses	0.944	1.033	−0.088	1.053
When a friend starts to talk about his/her problems, I try to steer the conversation towards something else	1.042	1.003	0.038	0.778
When I see someone being treated unfairly, I do not feel very much pity for them	0.933	0.967	−0.033	0.492
Other people's misfortunes do not disturb me a great deal	1.079	1.094	−0.015	0.120
I find it silly for people to cry out of happiness	1.028	1.035	−0.007	0.078
Index of all answers	15.935	16.340	−0.404	1.376

Notes: Responses are *always, sometimes, often, rarely, never*. Statements were used from the Toronto Empathy Questionnaire (Spreng et al. 2009).
*$p = 0.014$, $df = 38$.

Could humanitarian mapping become a place to start to teach empathy?

Discussion & Conclusions

Informed mappers made a similar number but more types of error

Beware of The Do-Good Effect: beginner humanitarian mappers might believe they are doing well just because they are doing good

Uninformed mappers grew less positive about technology in general but still grew more positive about mapping

Informed mappers are significantly more likely to say technology as a whole benefits society afterwards

Knowing the purpose of technical tasks promotes reflection on affective aspects of learning

Informed mappers became less negative about their interest in how do other people feel

What must we learn next?

- Our small sample size of student population limits generalizability and the study needs to be scaled up.
- The many possible configurations of participants, themes, and sites presents a complex landscape for contextualization and the study should be replicated in new places.
- Gender differences in this study were not detected among respondents but might emerge within scaled up, replicated research.

References & Acknowledgements

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