Online Attention of Universities in Finland: Are the Bigger Universities Bigger Online too?

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Abstract
As universities have entered a time of increased demand for public outreach and measurable impact, the universities are also exploring social media for student recruitment and science communication. Because many of the popular social media sites are free to use they could provide more democratic channels for organizational communication and marketing efforts. This research in progress investigates the social media presences of 14 universities in Finland and studies whether the offline performances of the universities are reflected in social media. The results suggest that while the RG score from ResearchGate and the Google Trends score for relative search volume correlate well with both productivity of the universities and university rankings, some of the other social media sites do not reflect the institutional characteristics as well. This is assumed to be a result of different types of usage and different purposes of the different social media sites.

Conference Topics
Webometrics; Altmetrics; Country-level studies

Introduction
Universities have entered a time of increased demand for public outreach and measurable impact. While competing for students the Humboldtian research universities try their best to conduct high quality research for the benefit of the society and to create a foundation for the research based education. At the same time social media has become mainstream in organizational communication (e.g., Badea, 2014; Huang, Baptista & Galliers, 2013; Lovejoy & Saxton, 2012). Organizations use social media for various purposes, both internally and externally, and for universities social media would seem to be an especially efficient tool for public outreach and for recruiting students. Social media are particularly efficient for sharing information through the online social networks, an aspect that would allow universities to efficiently reach their audiences. As the most popular social media sites are free to use, they may provide a more democratic way for universities to reach out to the various audiences and interest groups. This research in progress investigates whether this is true in the case of 14 Finnish universities: are smaller universities taking full advantage of the more democratic ways of communication or are the bigger universities with more resources also "bigger" in social media?

Literature review
Forkosh-Baruch and Hershkovitz (2012) investigated the use of social media sites Twitter and Facebook for scholarly purposes among higher education institutes in Israel. Their findings showed how the social media sites were extensively used for sharing academic or professional news. The authors suggest that use of these social media sites could therefore promote knowledge sharing and informal learning. Based on a content analysis of the messages shared in social media by the group of Israeli HEIs, the authors also discovered that the social media usage patterns followed similar offline usage patterns. The similar patterns here being the perception that colleges are more open and social, while universities tend to focus more on research and involvement in the research community; characteristics that were discovered in the content of the analyzed social media messages. Because of this lack of socializing and

interactivity among the universities, the authors conclude that "*the potential of SNS [social networking sites] as means of sharing academic knowledge in higher education institutes in Israel has not been actualized yet, but is indeed being explored by these organizations…*" With this the authors emphasize the importance of interactivity and audience involvement in organizational communication in social media.

In addition to social media visibility, interest towards universities, as measured by search volume on Google Trends, has also been discovered to have a connection with academic reputation (Vaughan & Romero-Frías, 2014). Vaughan and Romero-Frías (2014) used Google Trends to collect the relative search volume of the top 50 universities in the QS ranking from the US and the 56 Spanish universities included in the ARWU ranking. Their findings indicate that highly ranked universities attracted also more attention, as measured by search volume. In Google Trends the results can also be focused on searches within specific countries; one could for instance look up the search volume for "Kate Upton" in the UK or "Justin Bieber" in Norway. Vaughan and Romero-Frías (2014) discovered that while a great amount of searches for the US universities came from outside the US, only a few searches for the Spanish universities came outside of Spain, which according to the authors also reflects the international positions of the two sets of universities. As searches in English in general and for universities in English in particular may be assumed to be relatively low in non-English speaking countries, it may not make sense in all cases to focus on the country-level search volume in English. For instance in the case of Finnish universities we can assume that searches for them from Finland would mainly use their Finnish names, while the volume of searches in English would mainly reflect the international attention and interest.

Thelwall and Kousha (in press) took another approach to study universities' online presences and investigated whether the usage of ResearchGate and the publications uploaded to it by researchers has a connection with the "academic hierarchies" of different university rankings. ResearchGate is a scholarly social networking site where scholars can create their own profile pages and upload their publications to it, network with other researchers, and find possibly relevant and interesting publications, based partly on their own interests (as indicated on their profile pages) and partly on the interests of those in their social network. Based on researchers' activity on the site and their publications (both number of publications and the journal impact factor of the journals where the papers have been published in) ResearchGate calculates RG scores as a measure of individual researchers' "scientific reputation". The exact formula with which the RG score is calculated is, however, not revealed by ResearchGate. This approach can also be criticized because use of journal impact factors to evaluate or rank individual researchers has increasingly been criticized and condemned (e.g., DORA, 2013). Collectively the RG scores for researchers from a specific institution can give an institutional RG score, supposedly indicating institutional reputation. This is the score that Thelwall and Kousha (in press) used to compare to different university rankings. Their findings showed a moderate correlation between the rankings on ResearchGate and the other university rankings (The Higher Education ranking, QS world university rankings, Academic Ranking of World Universities, CWTS Leiden ranking, and the ranking on Webometrics.info). Because the rankings on ResearchGate are based on researchers' activities on the site and their research work, the findings by Thelwall and Kousha (in press) suggest that the usage of ResearchGate "broadly reflects traditional academic capital."

The current university rankings do place somewhat different weight on different things. For instance the ranking provided by the Webometrics.info measure online visibility, presence and impact, weighting most on visibility as measured by hyperlinks, while the other rankings use more traditional measures of research productivity and impact, i.e. publications and citations, and give them different weights (Aguillo, Bar-Ilan, Levene & Ortega, 2010). Still the different university rankings tend to give similar results, which would suggest that

universities performing well in one area also perform well on other areas. In other words, a university that is performing well when assessed with publications and citations seems to also perform well online. But whether this is reflected to the universities usage of social media and the attention they receive there is unclear. Attention and visibility in social media, as measured with various social media metrics, has been suggested to be a potential indicator of research impact (e.g., Bollen, Van De Sompel, Hagberg & Chute, 2009; Priem & Hemminger, 2010; Lin & Fenner, 2013). These new social media metrics, the so called altmetrics, could potentially give a more nuanced view of the attention towards research outputs. It has also been suggested that altmetrics could provide indicators for the societal impact of research (Bornmann, 2014) or provide knowledge about the interest towards research from a wider audience outside academia (Haustein, 2014). Although not yet extensively studied, altmetrics may also be able to provide country-level indicators of research impact, as Alhoori et al. (2014) have discovered significant correlations between bibliometric data and some altmetrics when aggregated to the country-level.

The research in progress presented here investigates the social media presence of 14 universities in Finland and with that opens research for institutional altmetrics.

Data and methods

The 14 universities in Finland all have online presences in social media. All have profiles, pages or groups on the most popular social media sites Facebook, Twitter, YouTube and LinkedIn, and some also have accounts on Instagram, Flickr or Pinterest. These are usually linked to from the university's webpage. The goal of this research is to 1) study how universities are using social media, 2) how much attention they have attracted, and 3) whether this attention is connected to other offline descriptive metrics about the universities' resources and performance.

Descriptive statistics were manually collected by visiting the universities' official social media profiles, as linked to from the universities' websites. The data consists of the number of tweets, followers and following on Twitter, "likes" on Facebook, subscriptions to and views on the universities' YouTube channel, followers on LinkedIn, and the universities RG score on ResearchGate. In addition to this universities' relative search volumes, as indicated by Google Trends, were retrieved. As the Google Trends score is a score relative to the search volume of the other words searched at the same time (maximum of five different terms compared in one search), we retrieved the scores for the universities' names in English by keeping the two universities with the highest scores included in the search for reference. This way all the scores were relative to those universities with the biggest search volume. The descriptive data about the universities and their performance were retrieved from the report of the State of Scientific Research in Finland, commissioned by the Academy of Finland (http://www.aka.fi/en-GB/A/Decisions-and-impacts/The-state-of-scientific-research-in-Finland/). This performance data consists of variables from 2012; the number of PhDs awarded, total person-years of the teaching and research staff, research funding, and number of publications. In addition to these the rankings of the Finnish universities were retrieved from the following university rankings; CWTS Leiden, ARWU, QS, THE, and Webometrics.info. Only Webometrics.info could provide the rankings for all but one of the 14 universities: the ranking of the fairly new University of the Arts (the former Academy of Fine Arts, Sibelius Academy and Theatre Academy merged to the University of the Arts in 2013). Nine of the 14 universities were found on QS ranking, seven on the CWTS ranking and on THE ranking, and five on the ARWU ranking. Only rankings from Webometrics.info and the QS were used in further analysis.

Spearman rank correlations between the social media metrics and offline data about the universities' performance were investigated to discover whether social media usage would

follow the academic capital at these universities. In addition to this, connections between the social media metrics and university rankings were also tested to see whether the universities reputation and performance was reflected in social media attention and usage.

Results

The different offline university specific metrics are clearly associated, showing how number of students and faculty, funding and publications are all very tightly connected (Table 1). This naturally means that universities with more funding have bigger faculty, more students and produce more publications. As some of these metrics are also used for university rankings it is only natural that the rankings correlate well with these (0.830, n=13, between publications and Webometrics.info; 0.867, n=9, between publications and QS ranking, both Spearman rank correlations significant at level 0.05). The universities that were omitted from the analysis due to non-existent data on Webometrics.info and QS were the universities with the least publications, a probable explanation why they were not covered by the university rankings.

Table 1. Spearman rank correlations between the social media metrics and offline metrics of the 14 universities in Finland. Correlations in bold are significant at the 0.05 level, two-tailed. (RG = RG score; GT = Google Trends score; Tw = Tweets in Twitter; Tw.a = Followers on Twitter; Tw.b = Following on Twitter; FB = Facebook likes; YTs = YouTube subscriptions; YTv = YouTube views; LI = LinkedIn followers; Phd. = PhDs awarded in 2012; Fa. = Faculty in 2012; Fu. = Research funding in 2012; Pu. = Peer-reviewed publications in 2012).

	RG	GT	Tw	Tw.a	Tw.b	FB	YTs	YTv	LI	PhD.	Fa.	Fu.	Pu.
RG	**1**	**0,679**	0,473	0,367	0,046	0,389	0,337	0,204	0,385	**0,923**	**0,938**	**0,952**	**0,969**
GT		**1**	0,444	0,435	0,251	0,266	0,316	0,342	0,160	**0,750**	**0,690**	**0,648**	**0,746**
Tw			**1**	**0,776**	0,516	0,345	**0,579**	**0,587**	**0,618**	**0,670**	**0,604**	0,534	**0,543**
Tw.a				**1**	0,499	0,059	**0,557**	**0,613**	**0,749**	**0,551**	0,468	0,393	0,420
Tw.b					**1**	-0,099	0,233	0,314	0,196	0,192	0,143	0,064	0,116
FB						**1**	0,260	0,015	-0,178	0,463	**0,574**	**0,604**	0,389
YTs							**1**	**0,871**	**0,700**	0,397	0,414	0,392	0,317
YTv								**1**	**0,754**	0,333	0,266	0,231	0,284
LI									**1**	0,423	0,349	0,323	0,380
PhD.										**1**	**0,974**	**0,949**	**0,960**
Fa.											**1**	**0,987**	**0,947**
Fu.												**1**	**0,943**
Pu.													**1**

Overall the number of tweets and Facebook 'likes' correlated moderately with the performance metrics of universities (Table 1), with tweets giving somewhat higher correlations on average than Facebook. While the number of followers on Twitter had some connection to the offline metrics, the number of followed accounts only had a very weak connection. This suggests that larger universities are not necessarily more active on Twitter, but that they still generate more attention.

Our findings indicate that research productivity (and the other offline metrics), as measured by the number of peer-reviewed publication from 2012, did correlate almost perfectly with the RG score on ResearchGate (0.969 Spearman, significant at the 0.05 level). The RG score did, however, not correlate well with many of the other social media metrics. Search volume on Google Trends also correlated well with the offline metrics, with the Spearman rank correlation between Google Trends score and number of publications being 0.746, significant

at 0.05 level. The relationships of these two cases are illustrated in figures 1 and 2. In both cases the University of Helsinki, the largest university in Finland, appear as an outlier due to its size. In figure 2 we can see a bit more scattering and how the University of Jyväskylä, and to some extent University of Eastern Finland and Aalto University, although not having exceptionally many publications still have managed to attract significant interest as measured by search volume on Google.

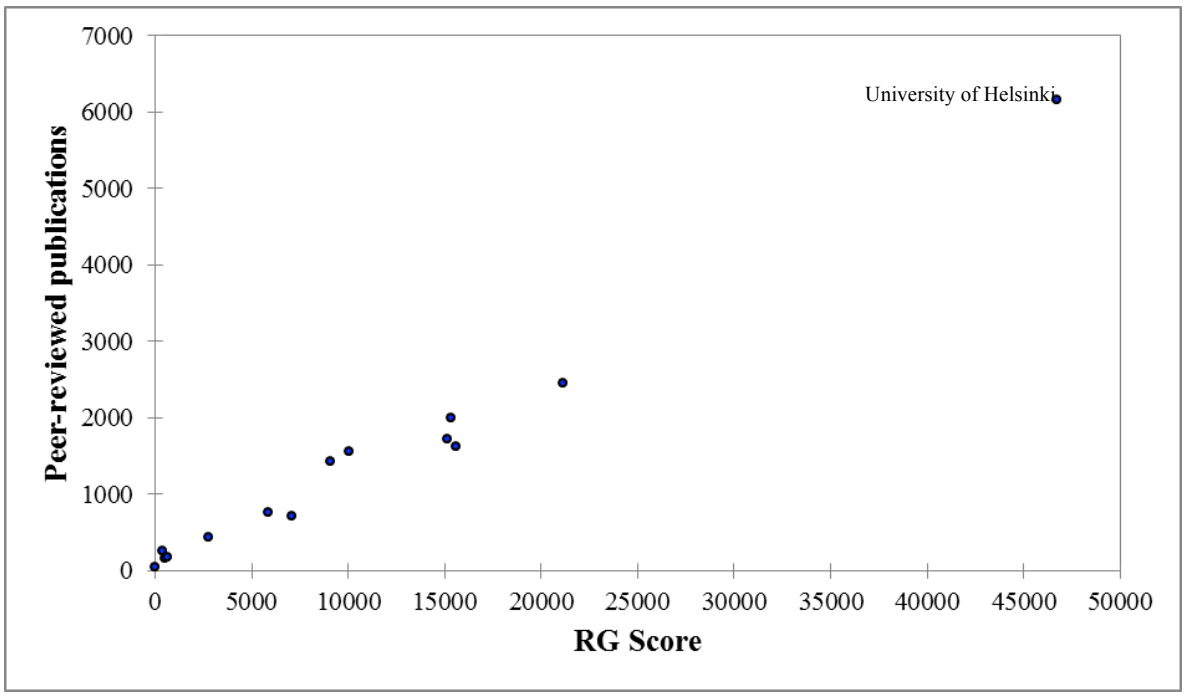

Figure 1. Correlation between the RG score (from ResearchGate) and the number of peer reviewed publications in 2012 at the Finnish universities (0.969 Spearman).

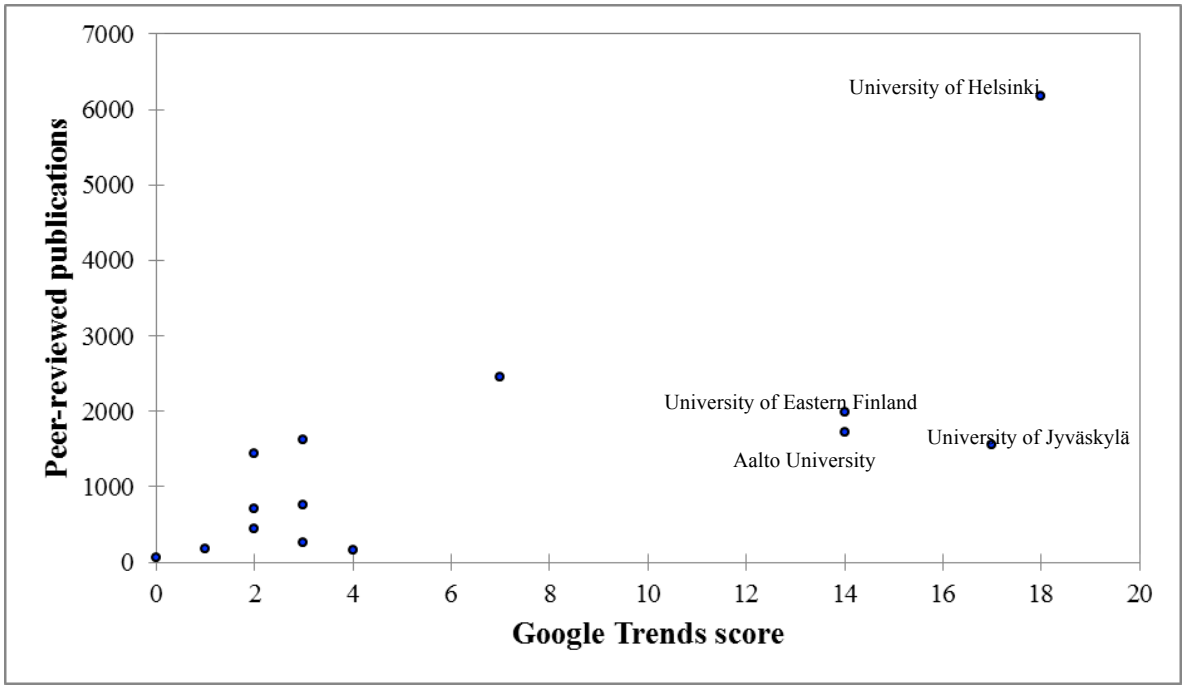

Figure 2. Correlation between the search volume as measured by Google Trends and the number of peer reviewed publications in 2012 at the Finnish universities (0.746 Spearman).

Discussion and conclusions

We set out to investigate the social media presences of 14 universities from Finland and the attention they have received in social media. Our results show that while in many cases the larger and more productive universities are also more active or receive more attention in social media; this is not always the case (Table 1). This suggests that the smaller universities, at least in this small sample, are benefitting from the more democratic channels of social media. Our findings also suggest, in line with the findings by Thelwall and Kousha (in press), that the institutional RG scores and the RG scores for individual researchers on ResearchGate, may be a promising source for altmetrics at institutional and possibly even country level. Due to the uncertainty of how the RG score exactly is calculated and because of the use of journal impact factors in that calculation more research into the topic is clearly needed.

The next step of this research in progress will be a content analysis of the universities social media accounts. This will provide new knowledge about how the universities are represented in social media, for what purposes they use social media, and how attention in social media is created. This will provide important background information for institutional altmetrics.

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