Building Personal Learning Networks through Event-Based Social Media: a Case Study of the SMiLE Project

Lisa Harris, Graeme Earl, Nicole Beale, Chris Phethean, and Tom Brughmans

University of Southampton, England, United Kingdom
`{L.J.Harris,graeme.earl,nes1g10,cjp106,t.brughmans}@`
`soton.ac.uk`

1   Introduction

In this paper we report on early findings of our SMiLE project which is evaluating how effective various online social networking channels can be in supporting how people network and learn from a major 'live' conference. The event took place at the University of Southampton in March 2012. We consider the dynamics of the relationship between 'real' and 'virtual' communities in the development of personal learning networks, for example how social networking impacts upon participants' interaction and engagement before, during and after the event as the community of practice develops. Assessing the impact of social networking activity on 'real world' outcomes has historically been a difficult task, but we argue that recent developments in social network visualisation and analysis now enable valuable insights to be generated for the benefit of both event organisers and attendees seeking to build their subject knowledge and extend their networks.

   We begin with a brief review of networking theory and the emerging role of the online backchannel at 'live' events, before describing the approach we took to the collection and analysis of social media data from the CAA Conference. We then discuss the implications of our findings for people looking to build learning networks through the increasingly blurred boundaries of 'real' and 'virtual' networks. We conclude by highlighting some lessons learned and possible directions for future research. Our findings also have relevance to the PLE conference itself – which this year has the added dynamic of two face to face locations for the conference operating at the same time to pose new multi-channel communication and learning challenges for participants.

2   Theories of Networking

Research in a number of academic fields has demonstrated that social networks operate on many levels, from families up to the level of nations, and play a critical role in determining the way problems are solved, organisations are run, and the degree to which individuals succeed in achieving their goals. Nearly half (49%) of all UK Inter-

net users have used social networking at least once in the last year and over 70% of people and households are now Internet users (IMRG, 2011). According to research by Experian Hitwise (www.hitwise.co.uk) social networks in the UK received more visits (11.9% of traffic) than search engines (11.3% of traffic) for the first time in May 2010. Facebook is now the second biggest source of traffic online, closing in on Google's position as the most visited website in the world. Online social networks are accessible at any time of day and provide instant access to a diverse global network of individuals, thereby overcoming many of the limitations of traditional face-to-face networking such as small network size and lack of diversity (Zontanos and Anderson 2004).

A fundamental insight in understanding the Internet was the 'small world' discovery which proposed that everyone in the world was connected to everyone else in 6 jumps (Milgram 1967). However, not all of the individuals were connected equally because some were very much more densely connected than others. In the original research carried out by Stanley Milgram, he sent letters to 160 people asking them to forward the letter to Stanley Carnap, a colleague of his in New York. All the letters arrived in less than six steps, the last step being through only three separate individuals who were close contacts of Carnap. Interestingly, a modern application of this research focusing on Facebook connections suggested there are only four degrees of separation between any two network members (Backstrom et al 2012)

It is the 'strong versus weak ties' concept originally pioneered by Granovetter (1973) that still dominates modern thinking on the best way to leverage networks. He showed that those individuals or nodes of a highly clustered network that lacked weak ties were deprived of the latest thinking and knowledge, and tended to be characterised by fragmented and incoherent communication. The pioneering work of Granovetter in delineating the network effect has since been popularised by a number of writers, notably Gladwell (2000), author of the best seller 'Tipping Point'. Watts and Strogatz (1998) integrated the work of Milgram and Granovetter with their discovery that introducing a few random links into an otherwise structured network caused a dramatic reduction in the degrees of connection needed to link all the members.

Misner (2008) noted that there can be a tendency when networking to focus on people who have similar experiences or perspectives, making it difficult to obtain new business connections. Instead, cultivating a more diverse personal learning network enables people to increase the possibility of including these connectors or 'linchpins'. Linchpins are people who in some way cross over between two or more clusters or groups of individuals, allowing them to link groups of people together easily. A recent study by Bakshy et al (2012) of activity on Facebook, the world's largest contemporary social network, found that weak ties could play an important role in information sharing and network building. Although an individual strong tie was clearly influential, people who conversed infrequently through a series of weak ties often had more diverse social networks resulting in access to more novel information, allbeit on an ad hoc basis.

3 The Growth of the "Backchannel"

Ross et al., (2011) define a digital backchannel communication as a 'nonverbal, real-time, communication which does not interrupt a presenter or event' In a backchannel,

the individual tweets combine to form a powerful Twitter stream that can change presentations from stagnant to flowing and from slow to fast moving (Atkinson, 2011). 'These digital backchannels rise in importance as social information spaces, in which people complement and co-create large-scale events,' (Dork et al., 2010). Since Twitter is a public and potentially a global space, 'people on Twitter have their own audiences in the form of their followers, so whenever they post something they open up a new communication channel that extends outside the room' (Atkinson, 2011:54). According to Atkinson (2010:17): 'A backchannel is a line of communication created by people in an audience to connect with others inside or outside the room, with or without the knowledge of the speaker at the front of the room. Usually facilitated by Internet technologies, it is spontaneous, self-directed, and limited in time to the duration of a live event. A backchannel can be constructive when it enhances and extends helpful information and relationships, and it can be destructive when it articulates and amplifies counterproductive emotions and sentiments.'

DeVoe (2010:167) notes the importance of Twitter at conferences; 'Participating in conferences online via Twitter has growing appeal for conference enthusiasts, regardless of whether they are physically attending. For those who are unable to attend in-person, tweets after the conference help give a sense of "being there" while still catching the salient points of presentation talks. For on-site participants, contributing and commenting on tweets aids in creating rich, multi-threaded conversations that span the length of the conference and beyond.' (DeVoe, 2010:167)

In summary, 'the backchannel dismantles the pedestal and gives everyone equal access to the same information' (Atkinson, 2010:207). It is clear from this brief review that online network building and engagement can offer significant value over and above what attendees derive from the event itself. From a learner's perspective, the increasing efficacy of video and twitter channels in providing such opportunities for remote attendees means that decisions have to be taken on whether physical attendance is worth the time, inconvenience and cost of physically travelling to an event. In the next section, we describe how we collected data from 'actual' and 'virtual' conference attendees and analysed the impact of social networking activities on the networking and learning opportunities presented by the event itself.

4   Methodology

We monitored the use of a range of established and experimental social media tools to track how they were utilised by both 'real' and 'virtual' delegates before, during and after the conference. We expected that such activity would include information recording and sharing, network building, profile raising and contribution to the development of a sustainable community of practice. During the event, we carried out a number of interviews with conference participants about their individual experiences and interactions via Twitter, Storify, Flickr, Vimeo, and groups on LinkedIn and Facebook. We used tools such as the #caasoton WordPress site to share information with delegates, and many other platforms, including Corkboard, to reflect real world activities at the conference, including a drive to collect delegates' memories of past events where physical records were converted into a digital timeline. We used platforms such as delicious to automatically collect URLs to resources, and saved tweets to an online archive to curate and then share in the future. We also set up projects to

extend beyond the conference including a Wikiathon event and a blogging competition, organised as part of the international Day of Digital Humanities event. We were fortunate because all delegates (over 450 people) were required to complete a survey in order to register for a new membership website, and we included relevant questions about their social media usage at the event in this document for later analysis. More details of our online and offline data collection processes are available in the Appendix.

5   Early Findings

5.1   Use of Social Media

So how did it go? We have been overwhelmed by the continuing use post-event of the social media set in place during the conference. There are so far over 12,000 tweets that have used the #caasoton hashtag, with more discussions continuing on Twitter. To date, over 430 photos have been uploaded to the #caasoton Flickr group and our Vimeo videos have been viewed over 2,100 times, with viewers from 47 countries. Nearly half of the 450 conference delegates used #caasoton on Twitter before, during, or after the event, and there were many new converts to the tool. There was an active group of 'virtual' contributors (over 70 people registered with the event as 'virtual attendees') on Twitter, with some 20 additional users joining in the conversations from elsewhere.

Figure 1 below taken from our post event survey highlights what people were mainly using social media for:
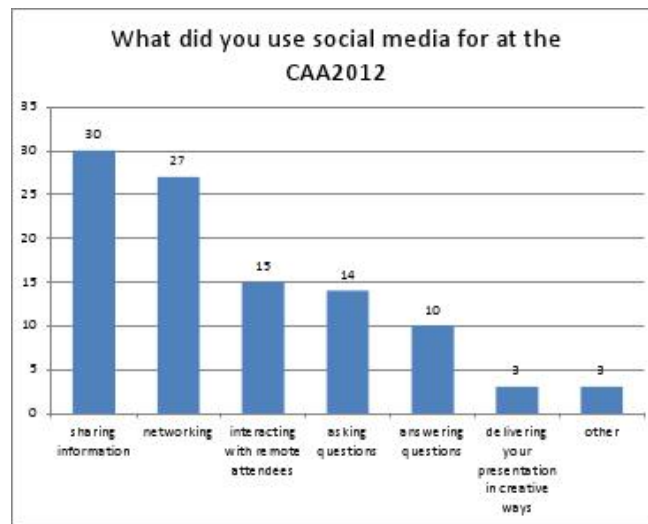

Fig. 1. Uses of social media at the event

From the specific comments delegates made about the value of social media at the event, we observed that tweeting during sessions allowed people to make connections and curate what was going on in different rooms, in real time. Some of these discus-

sions could even be considered as defining new online 'sessions' or themes, as dele-gates' comments from the post-conference survey show:

"The virtual interaction across sessions was interesting and added to the sense of the conference as a single event. Often 'themes' are fragmented with little cross polli-nation…this was reduced at CAA12 by social media."

"It was great to be able to follow a discussion taking place during the paper being delivered"

"It was possible to follow something of the interesting parallel sessions you could not attend and to pick up interesting urls and so on."

"I felt the comments enriched the discussion and help bond some delegates more quickly than by happenstance in the social events"

"It was extraordinary. It helped me gauge the general response to papers I was at-tending and not attending. Fantastic."

And from real-time Twitter comments:

"Almost everyone in this session has tweetdeck open or is tapping away on a phone. And it's totally appropriate"

"Amazing use of social media, accessability, connectivity. Set the bar VERY high for all future conference"

A number of challenges were also highlighted that need to be considered for the future. Some people who were not active social media users felt excluded from the conversations that were happening within the online platforms that delegates were us-ing:

"If you have no social media account you are no one."

And of course the opinions expressed online can only reflect the views of one segment of the total population, which is not necessarily representative of the commu-nity as whole:

"I think just looking at the twitter stream gives a skewed idea of what people really think is interesting or noteworthy."

This last point is perhaps of most interest. The same respondent went on to com-ment that the Twitter stream had provided an idea of what others at the event were finding interesting but that they felt that this was not necessarily representative of the whole delegation which may not have been a representative sample of the attendees. Looking at the Twitter archive, this is a fair comment, as from a delegation of 420, there were 184 users using the #caasoton hashtag. Just under 44% of the delegation were present in Twitter. Similarly, in our ongoing analysis we are exploring the extent to which twitter encouraged specific forms of communication within the conference, perhaps concentrating on discrete ideas that were clearly expressed in papers rather than complex syntheses and ambiguous conclusions.

There were also concerns expressed about the public nature of the activity and the extent to which photos or comments were being shared without specific permission, for example in blog posts or via Storify. While there was significant enthusiasm to archive the whole collection of online materials for the benefit of researchers or the organisers of future CAA events, other delegates felt that the data should first be anonymised, or indeed not kept at all. This dilemma is being addressed in ongoing discussions about the development of a code of conduct for the collecting and then archiving of social media data in an appropriate way.

5.2   Archiving Issues

There were some interesting comments from delegates about potential uses for the Twitter archive. The issue is not just saving the data, but preserving it in a way that is meaningful and useful for learning purposes. Particularly thought- provoking were those comments that considered how real value could be added to the 12,000 tweets available online. One survey respondent said: "Who's going to read all those 12,000 messages?" And another: "Basically there is no use saving it all. Making informed selections and processing it into a desirable and accessible format would be best." Specific suggestions for making the data more useful included linking specific tweets to papers as they were presented, and also incorporating later tweets and feedback relating to individual papers. Similarly we are considering the many possibilities of data mining, although again in the context of wider ethical considerations. Of particular significance here is the ethical relationship between making thoughts public (i.e. tweeting) and making broader interconnected narratives and opinions public (i.e. via data mining of tweets).

Research by Costello and Priem (2011) evaluated the opinions of twitter users about the archiving of tweets. The results were quite negative - although most people interviewed said that tweets should be archived, particular concerns were expressed about 1) institutional archiving (as being analogous to the recording of phone calls by one's boss) and 2) the possibility of individual comments being taken out of context and used against the author in the future. The authors noted that the decision by the US Library of Congress to archive tweets (which took place during their data collection) had a notable positive impact on the acceptability of tweet archiving to their interviewees. These two concerns resonate with our own plans for the tweet archive.

Firstly, in partnership with the JISC DataPool project based at Southampton, we are exploring possibilities for a University-wide system or procedure for archiving tweets. Such a system would work on request i.e. a member of the University would request particular @ and # tags to be archived over a given period, rather than the University implementing a blanket policy of harvesting tweets generated by members. The datapool project is producing policies and frameworks for research data management across the University. One case study in this project relates to the archiving of social media content created relevant to ongoing research projects. We are exploring the ethical and legal issues for this in the SMiLE project as described above, so DataPool is concentrating on defining a policy framework for management of such content by UoS researchers, advice on social media use for research activities (in partnership with Digital Literacy initiatives and the Student Digital Champions), and evaluation of social media archiving and mining platforms. The latter has involved discussions with the Web Observatory and Eprints, both of which provide solutions for harvesting and

interconnecting very large volumes of social media content. We are currently working with them to develop tools for UoS researchers to generate such archives.

Secondly, we are very keen on expressing context through mechanisms such as timelines and network visualisations. Such expression of context is itself not without its problems as by representing context it becomes much easier to see trends in discussion, for example about individual papers, whether these are positive or negative in tone.

As part of the preparations for the depositing of the archive with the ADS, all users who had used the #caasoton hashtag were contacted and asked to complete an opt-out form for any tweets that they wished to have removed from the twitter archive. No users came forward, and so the twitter archive will at present be submitted to the ADS for consideration complete. The archive will undergo a standard collection and retention evaluation at this stage and we will continue to develop a long-term deposit strategy with the ADS. Separately, within the post-conference feedback process, all delegates were asked to comment on what they thought the future of the twitter archive should be. 151 responded to the survey. The majority of respondents preferred that the archive be kept, with most preferring submission to the ADS. Out of those participants who wished for the survey to be submitted to the ADS, over half wanted twitter users to be given an option to opt-out of the archive. Figure 2 below gives an overview of the results:
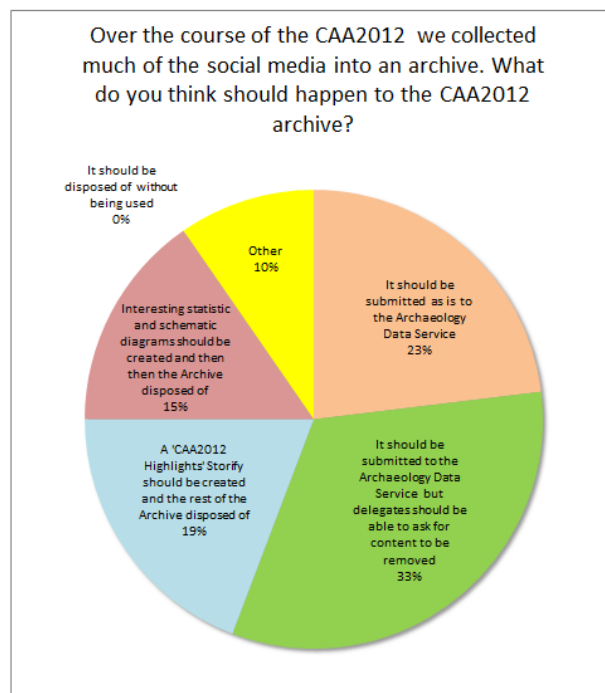

Fig. 2. Survey respondents' ideas for #caasoton social media archive

15% of respondents wanted to see visualisations of the data, which will be discussed in another paper. 56% felt that the archive should be kept, with the majority of

that percentage preferring to be given an option to remove their content from the archive.

6 Learning Benefits for Participants

The SMiLE project has provided data with which we can begin to test the extent to which social media can support people with network building, the development of subject knowledge, and the experience of a live event generally. Through post conference feedback delegates have evidenced that social media can support the development of specialised networks for individuals, and this is supported by the work carried out by Reinhardt et al., that noted how Twitter could contribute during conferences to building ties within soft communities (2009: 153). Respondents told us that:

- Social media allowed them to 'meet' people at the conference that they would not have had time to meet if those tools were not being so extensively supported,
- Circles of contacts were strengthened and extended through conversations occurring on Twitter around a common topic,
- They had identified new contacts with whom a connection was not apparent before engaging with their social media user profiles,
- It provided a way to find out more about delegates who were at the conference, in order for new possibilities for connections to be explored,
- Increased interest in sessions being run at the conference therefore broadened the group participants,
- Social media gave additional information about delegates away from their CAA presence, which led to new relationships being instigated at the conference that would not have been pursued if only the information available at the event had been available.
- Social media also provided a new way to support the development of subject knowledge. Delegates told us that through the support of social media at the event the following learning had occurred:
- Twitter provided a safe environment to ask 'silly' questions that delegates would not be comfortable asking within the conference,
- The social media was a platform for conversations to occur between individuals that were not together at any point during the course of the event (because of differing interests),
- Online interactions made the subject matter more accessible for newcomers to archaeological computing,
- To a certain extent, following conversations happening within the social media individuals were able to gain an idea of topics that other delegates found interesting,
- Additional tools and resources were referred to and linked to through the social media,
- The social media provided opportunities to follow up things that were happening at the event and therefore lead to the discovery of further information, and quicer,
- Following conversations happening on social media platforms meant that individuals were able to identify more relevant sessions that were running and therefore ensure that the most useful parts of the conference programme were encountered.

Delegates were asked to comment generally on how social media contributions had added to their experience of the CAA event, in almost all instances responses were positive. Overwhelming opinion was towards the usefulness of Twitter as a platform for following what was happening elsewhere at the conference, joining up separate sessions and topics. Some of those comments are highlighted below:

"Being able to "follow" more than one session at a time, getting immediate feedback from the audience spread to thousands of people and cultivating a geek approach to discussion are all parts of the good #caasoton experience."

"Enhanced feeling of connectivity, excellent networking tool to meet delegates', ability to monitor multiple sessions, increased dialogue outside session presentations."

"The virtual interaction across sessions was interesting and added to the sense of the conference as a single event. Often "themes" are fragmented with little cross pollination this was reduced at CAA12 by social media."

"It was possible to follow something of the interesting parallel sessions you could not attend and to pick up interesting urls and so on."

"Allowed me to follow what was going on in parallel sessionsand allowed me to participate in discussions during the sessions I was in."

"It was extraordinary. It helped me gauge the general response to papers I was attending and not attending. Fantastic."

"I felt the comments enriched the discussion and help bond some delegates more quickly than by happenstance in the social events."

"Increased awareness of others using the same tools to discuss networking more freedom to discuss questions outside of the room and in multiple rooms remotely- at the same time!"

"Many ways- hard to describe as this was my first conference where social media has hit the saturation point needed for it to be useful & stimulating. I felt more engaged because I was able to discuss themes and questions with people not in the session. I was more aware of the general themes of the conference, the bigger picture was easier to grasp but I was also keenly aware that I was missing very cool papers in parallel sessions!"

"As expected it allowed me to see what people were saying both in sessions I was attending and other sessions going on as well as different events at the conference."

One comment regarding the use of a daily hashtag to stimulate discussion is interesting; the delegate comments: "The daily hash tag events were thought provoking even if I didn't actually take part in them." The daily hashtags had a very low uptake, and this comment highlights how difficult it is to measure the success of such an intervention; until this feedback it was assumed that the hashtags had had little impact, but instead it seems that they were noticed, and created discussion, but were not used explicitly within tweets.

The online channels provided an additional space for conversations to continue after sessions dedicated to particular topics had ended, as one survey respondent said:

"It was interesting to see discussions develop on twitter after presentations."

Delegates felt frustration that the conversations that were happening in Twitter were not then brought from that platform into the real world event, as the comments below evidence:

"I saw comments from other people and added my comments, however these were not directed to the presenter which was a shame."
"For me not much. I don't have a Twitter account which seemed to be the main activity going on and some of which was visible on Facebook."
"It was hard to follow since so much posting was going on. I also felt like some folks were tweeting at the expense of hearing the presentations or discussion effectively."

One respondent summarised the issue of there being so much activity occurring at a live event within an online channel:

"…. I just think people aren't good at multi-tasking even though they think they are."

This highlights that there is a need when implementing a strategy for supporting social media at such a high level to provide ways to experience the vast amounts of information being produced that are in addition to the those provided by the tool itself. From the post-conference survey, we know that over half of the delegates who responded were using a device other than a laptop or PC to access the social media, and more support could have been provided to ensure that other means to access data were available at the conference. For instance, the Twitter feed was streamed live onto one plasma screen at the event, and more screens showing alternative live Twitter searches could have been set up, with additional screens for other social media content, such as the Flickr photos being submitted by delegates, could have been showcased. For us, this tweet from a delegate summarises the challenge of the event's use of social media:

"At least before twitter I could dwell in blissful ignorance of all the cool pertinent stuff I was missing #caasoton"

The challenge now is to work on designing interfaces that allow users to investigate the data in the most useful way. By far the richest social media data is the Twitter hashtag archive. Our initial visualisations of the Twitter data uses network analysis to illustrate the relationships that exist between Twitter users, through linking different information together, such as shared hashtags, or retweets.

7   Next Steps

The team hopes also to analyse the content of the #caasoton tweets to begin to provide information that will contribute to the planning of future events. It is anticipated that the information will provide useful insights into the requirements of this specialised network. For example a high percentage of the tweets using the #caasoton hashtag contained URLs. The top ten online resources will be identified and shared with the

network and in addition to this, types of sites referred to by the URLs included within tweets will be analysed using a categorisation method similar to that put forward by Weller et al. in their paper investigating Twitter citation analysis for scientific conferences (2011). This categorisation will aid the identification of the most popular kinds of resources used by the network.

Since the conference, we have recruited a number of MSc students who are drawing upon the social media data from the conference to write dissertations over the summer. Their topics include bridging the 'tweeting divide', managing online communities in the context of live events and the opportunities and challenges posed to researchers by data visualisations. When completed, we plan to publish summaries of all these project findings as freely available downloadable resources. We will also be developing resources for other institutions planning live events who wish to use social media to enrich the delegate experience, as we believe that these platforms and tools have real potential for increasing opportunities for sharing knowledge that research events already foster. We are also working with the Oxford e-Research Centre to develop a code of conduct and best practice guide for the collecting, curating and archiving of social media data based on our experiences so far, and to publish in greater depth on the ethical considerations for such activity. Finally, we have noted how the SMiLE project is forming a case study for the JISC DataPool project and we will contribute to its final report and recommendations. A SMiLE team member, Nicole Beale, has been co-opted onto the CAA steering committee as the social media advisor and is currently designing a social media strategy for the next CAA conference, due to take place in Perth in 2013. This next event will provide an opportunity to test findings from the initial stages of the SMiLE project.

References

1. Albert, R., Barabási, A.: Statistical mechanics of complex networks. Reviews of modern physics, 74 (January), 47-97 (2002)
2. Bakshy, E. et al.: Role of Social Networks in Information Diffusion http://www.scribd.com/facebook/d/78445521-Role-of-Social-Networks-in-Information-Diffusion (2012)
3. Backstrom, L. et al.: "Four Degrees of Separation" Web Science Conference Presentation, Chicago http://arxiv.org/abs/1111.4570 (2012)
4. Gladwell, M.: The Tipping Point, New York: Little Brown (2000)
5. Granovetter, M.: "The Strength of Weak Ties", American Journal of Sociology, 78 (6) May 1360-80 (1973)
6. IMRG 2011. Country Profiles: United Kingdom of Great Britain and Northern Ireland, London: Interactive Media in Retail Group / CapGemini, available at: www.imrg.org
7. Milgram ,S.: "The Small World Problem" Physiology Today 2, 60-67 (1967)
8. Misner, I.: 'Diversity and networking' Entrepreneur.com (2008)
9. Newman, M.: Ego-centered networks and the ripple effect. Social Networks, 25 (1), 83-95 (2003)
10. Newman, M.E.J.: Networks: an introduction. Oxford: Oxford University Press. (2010)
11. Reinhardt, W., Ebner, M., Beham, G., and Costa, C.: In Kreativität und Innovationskompetenz im digitalen Netz: wie kommt das "Neue" mit Hilfe von Internettechnologien in die Welt? (Eds) Luckmann, M. and Hornung-Prähause, V. Sammlung von ausgewählten Fach-

und Praxisbeiträgen der 5. EduMedia-Fachtagung 2009, Salzburg, 04. - 05. Mai 2009; [St. Virgil, Salzburg ; Tagungsband] 145-154 (2009)

12. Roberts, S.G.B., Dunbar, R.I.M., Pollet, T.V. & Kuppens, T.: Exploring variation in active network size: Constraints and ego characteristics. Social Networks, 31(2), 138-146 (2009)

13. Watts, D.J. and Strogatz, S.H.: "Collective Dynamics of Small World Networks" Nature 393 440-442 (1998)

14. Weller, K., Dröge, E. and Puschmann, C.: Citation Analysis in Twitter: Approaches for Defining and Measuring Information Flows within Tweets during Scientific Conferences' Making Sense of Microposts Workshop (#MSM2011), Workshop at the Extended Semantic Web Conference 2011, 30 May 2011. Heraklion, Crete. http://ceur-ws.org/Vol-718/paper_04.pdf (2011)

15. Zontanos, G. and Anderson, A.: 'Relationships, marketing and small business: an exploration of links in theory and practice' Qualitative Market Research: An International Journal, 7 (3), 228-236 (2004)