Social Media Usage at Universities
How Should it Be Done?

Jennifer-Carmen Frey, Martin Ebner, Martin Schön and Behnam Taraghi

Social Learning, Computer and Information Services, Graz University of Technology,
Münzgrabenstraße 35a, Graz, Austria

Abstract: The social media hype these days is omnipresent, encouraging even public institutions to participate. This study seeks to reveal, which factors have to be kept in mind, when doing social media work at universities. It also is an attempt to provide a list of recommendations and possible fields of action to ensure an efficient presence in social web. Therefore we analyzed the present situation of university efforts and evaluated the success by measuring user engagement concerning different aspects of social media activities (e.g. content, publishing time, frequency of activities, existence of visual elements, additional links, etc.) The study shows, that it seems less important how many times a week a university is publishing, or how long the text messages are in detail, but that there is a significant relationship between the contents of a post, the time of its publishing and the used elements, pointing out that users actively perceive and interact with social media activities that encourage contact between both: the profile-owner with the community and the community amongst itself - especially if made in a personal, emotional or funny way, offering people ways to identify with the institution and to connect with it through well-known habits and traditions.

1 INTRODUCTION

Social software is still one of the most promising technologies with continuing success since the rise and popularization of the term Web 2.0 in 2005 (O'Reilly). Since these early stages, the social software objective has been named in nearly every summary or outlook of important technologies, as for instance in Gartner's top 10 strategic technologies for the years 2007 to 2012 (cf. Gartner Inc.) or in the IEEE Spectrum magazine's top 11 technologies of the decade (placed as number two) (2011). On the other side social software has a very broad range and therefore Ebner and Lorenz (2012) defined a three-dimensional cube represented by the axis Identity and Network Management, Information management and Information and Communication. In this cube the best fulfilling social software are so called social networks colloquially social media like Facebook, Google+ and Twitter.

For marketers and organizations social networks provide the opportunity to reach a broad audience with the advance of direct communication to the target group and a low spreading loss. On the other side individuals get the chance to participate and find new communicational possibilities for social interaction as well as new ways to filter and assess the massive overload of information mankind has to cope with nowadays. Therefore it seems naturally, that more and more sectors of human life – containing companies, non-profit-associations or governmental and public organization – are entering this field of operation: trying to use this software for their own purposes and benefit of its indwelling chances.

While the success of the first pioneers in social networks is founded on their innovative and reckless use during the boosting time of the upcoming social media hype, today's newcomers won't benefit from that boost anymore. Who tries to join the social community now has to know about the characteristics of the present situation and start an individualized and conceptualized approach to establish a solid performance in the whole social web (Evans, 2010). This is also true assuming the fact that those who haven't risked starting in a totally new field of opportunities while there were no conventions or inherent standards will most probably not risk starting in a settled system without concrete instructions.

According to this, there is a pressing need of research supplying approved and validated knowledge of the given field of expertise as current resources are most times based on personal experiences rather than scientific evidence. As for example there is a vast number of weblogs or other web resources, giving advice for social media marketers, e.g. Porterfield (2012), Honeysett (2012) or Baer (2013).

This research study tries to supply verified answers for the persons in charge of the social media channels with a special focus on universities, giving an insight into the prerequisites and requirements and providing a set of recommendations for establishing and maintaining a stable and valuable performance in the social web.

In a first step we analyzed the present field of social media performances of universities in an attempt to identify major factors for user engagement and - as a result - for efficient social media activities. These factors are subsequently used to develop concrete social media strategies for the sector of academic institutions.

2 METHODS AND RESEARCH QUESTIONS

2.1 User Engagement and the Efficiency of Social Media Activities

To find out what are the main elements of an efficient and reasonable performance in social media for the specific field of universities, we analyzed the present approaches of engaging academic institutions. Therefore all activities of a university's profile on a specific social media platform were documented and evaluated in relation to their corresponding user engagement.

User engagement is an important instrument to measure the value and sustainability of social media activities. First and foremost it shows how many people actively perceived a piece of message and are affected by it in one way or the other. Furthermore it also defines the reach of the message, as generally user engagement increases the spread of a posting within the social media platform and – e.g. in the case of Facebook – also the spread of future postings through recommender algorithms that reward overall site activity with further reach.

Hence, analyzing the characteristics of a post in comparison to its yielded user engagement should allow identifying important influencers of a post's

success or failure, which has been one of the primary goals in this work. For this purpose, a list of post characteristics is defined that might influence the chance of reception and engagement of the stakeholders. These characteristics have been used later on for an accurate analysis of the collected data aiming to identify the constituents of an efficient social media post. All this finally is concluding in an approach to develop a set of social media strategies for academic institutions.

2.2 Research Questions

For the analysis of present social media activities, the following research questions have been investigated:

- Are there primary influencers for the engagement of users in social media posts?
- Which influencers can be identified?
  - Which characteristics determine relevant content for messages in social media?
  - Does the frequency of publishing social media messages influence the user engagement?

2.3 Present Social Media Activities of Universities

Out of the various possibilities in social media, the research study is strongly concentrating on social networking sites, as they represent the primary objective of social media displaying social structures and relationships and can be used to create and maintain a perceived presence in social.

Within the range of social networking facilities, the world's best-known platforms Facebook, Google+ and Twitter are chosen and a set of universities for every platform is defined, which should be investigated further. The universities differ in terms of language, origin, size and educational approach to display a broad and representative view of universities' present activities in the social web. The chosen set contains US-American (e.g. Harvard University, Ohio State University) and English sites (e.g. University of Oxford, University of Cambridge), as well as sites from Germany (e.g. Goethe University Frankfurt am Main, LMU Munich, Austria (e.g. University of Innsbruck, Johannes Kepler University Linz) and Switzerland (e.g. HSG – University of St. Gallen, University of Basel). There are also a few institutions with technical background (e.g. Massachusetts Institute of Technology or Ilmenau University of Technology) and universities of applied sciences (e.g. FH Joanneum, Cologne University of

Applied Sciences) included in the analyzed data. A basic rate of user engagement has been the prerequisite for the selections of universities to guarantee reliable data within the examined time period.

2.4 Post Characteristics and Possible Influencers

The research study tried to take into consideration a various amount of possible influencers of an appropriate and engaging post by classifying the posting and its characteristics into different categories. These categories are mainly determined by the special needs and use cases of universities to guarantee appropriate standards for the further development of social media strategies.

The examined aspects of a postings are characterized by

- *time of publishing*
  The time of publishing has been listed in local time.
- *addressed target group*
  The addressed target group contains the categories staff, students, future students and the public.
- *used elements*
  Used elements or components of a post can be videos, pictures, text and hyperlinks. Beside the influence of a single element also the importance of the composition of these elements is analyzed.
- *message length*
  Here the number of characters used in a message is analyzed.
- *content characteristics (e.g. subject, function and time reference of a posting)*

Content characteristics contain the post subject, function and time reference. Table 1 shows a list of the specific categories defined for these characteristics.

Table 1: Analysed content characteristics.

subject	function	time reference
• research	• information	• announce-
• study	• promise	ment
• university	• interaction	• news/reports
• university teams, projects	• contact	(after event)
	• fun	• seasonal
• non academic	• expression of emotions	• serial
		• without time reference

Additionally we also tried to find a correlation between the user engagement and the frequency of published contents of the universities.

2.5 Measurement of User Engagement on Facebook

During the examined time period, it became obvious that Facebook can be seen as a sort of exemplary standard for present social media efforts (further details are explained in the next chapter). As a consequence the study concentrated on a detailed investigation on the findings of the Facebook results. For that reason a method was designed to measure user engagement based on the characteristics of Facebook's edge rank.

To evaluate the user engagement of a given post in comparison to other posts, it is necessary to explain the process and prerequisites of user engagement in Facebook posts. An overview of the process is also shown in figure 1.
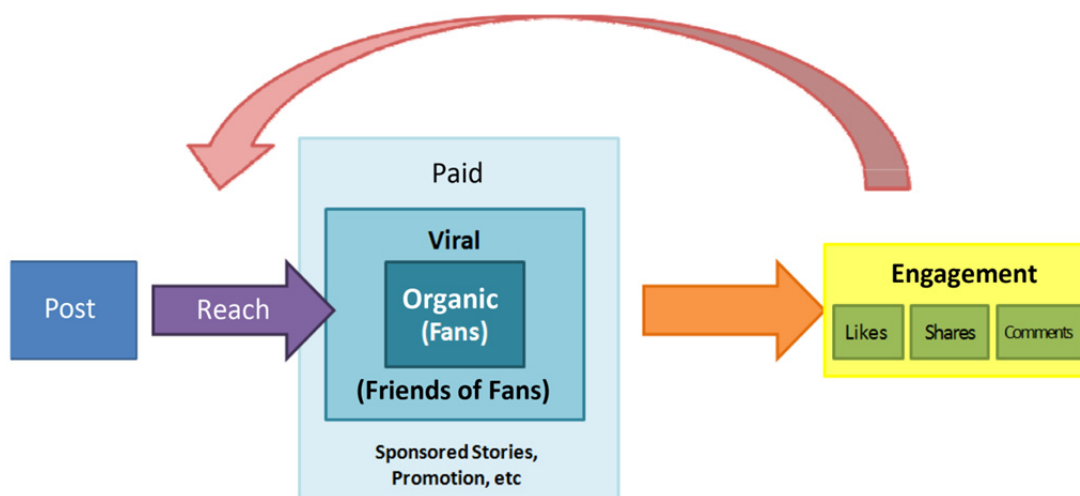

Figure 1: The process of user engagement.

Any published Facebook post has got different preconditions concerning the possible engagement rate. This is primary due to the reach of that specific post.

There are different ways to reach the audience within Facebook. The post does either reach them in an organic, a viral or a paid way. While paid audience can only be reached by Facebook ads and promotions, the viral reach, meaning how many friends of fans did see that any of his or her friends engaged with the site, depends on a high percentage on the organic views of a Facebook post. The organic Facebook audience represents a subset of the site's Fans. This subset is determined by the Facebook edge rank, a recommender algorithm assigning every posting a certain value for every single user of Facebook. The edge rank algorithm defines which users see a posting in his/her information stream and which do not.

According to different resources on this topic and with due regard to the fact, that there are still some settings, that are not issued in these resources to keep some secret of the news stream composition, the Facebook edge rank consists of the following values (What is Edgerank?, 2013) and (Tarbaj, 2013):

- *Affinity* (How strong is the relationship between the site/posted content and the user: how often does he/she interact with the site, how many friends of the user do interact with the site, is it a content the user typically tends to interact with, etc.)
- *Weight* (Value to promote specific content in comparison to other content types, the specific values are not commonly known for that factor.)
- *Time decay* (How many time has passed since the publication of a post.)

Considering all these factors, the possible reach of a Facebook post is determined by:

- fans of a site
- the interaction rate (visible as the talk-about count of a site)
- further settings of the Facebook edge rank, which are not visible for users

To evaluate the *Efficiency* of a specific post *p* we therefore calculated an estimated user engagement *est(p)* considering the existing conditions of publication of that post and compared that value with the actual reaction *act(p)* it has achieved.

$$Efficiency(p) = \frac{100*act(p)}{est(p)} \qquad (1)$$

Assuming recent statistics, that show a significant decrease of interaction rates within large fanbases (Jochemich, 2013) proving that a grand amount of fans is influencing the overall interaction rate in a substantial way, we covered this fact by dividing the analyzed universities by scale into three different types.

- universities with less than 5,000 fans
- universities with more than 5,000 but less than 100,000 fans
- universities with more than 100,000 fans

For those types the average amounts of post reactions (sum of likes, shares and comments) per fan are calculated as well as the average amounts of post reactions per talk-about to provide comparable relative factors for the estimation of user engagement. These factors are shown in Table 2.

Table 2: Relative factors for the estimation of user engagement.

scale	reaction per fan	reactions per talk-about
>100,000 fans	0.0015	0.0626
5,000-100,000 fans	0.0021	0.0622
<5,000 fans	0.0076	0.1207

According to that, the estimated user engagement can be calculated by estimating an overall reaction with the actual fan and talk-about count of a posting.

$$Est(p) = (fans(p)*fanfactor(size(p))+talk\text{-}about(p)*talk\text{-}aboutfactor(size(p)))/2 \qquad (2)$$

2.6 Field Study

The data, we gathered from university-posts on Facebook, has been systematically documented and categorized in regard to the above-mentioned posting characteristics.

After that we evaluated the thus enriched data in relation to the quantitative measurement of user engagement described previously, therefore using statistical techniques (predominantly correlation methods, e.g. Pearson's correlation, rank correlation, etc.) to give significant and hence validated statements. A logarithmic relativization has been made over the values for efficiency as to balance out the spread of engagement data, which has been very inhomogeneously distributed over the given field.

3 RESULTS

For the analysis of present university approaches in

Table 3: Overview of the analyzed data.

	Facebook	**Google+**	**Twitter**
universities	20	12	26
posts/activities	1.196	231	2.301
comments/replies	7.772	121	1.090
range of fans/followers	457-2.051.296	59-8701	422-163.578
range of average posting count	15-107	8-61	3-658
max. engagement (sum of interactions)	14.375	56	80
range of average engagement per university	5-2060	0,2-20,7	0,05-17

social media, all activities of the selected universities between 15.09.2012 and 07.11.2012 were gathered. This results in over a thousand Facebook posts, about 300 Google+ activities and about 2,500 Twitter statuses. An overview of the gathered data is given in Table 3.

The results show the unquestioned reign of Facebook in the social media sector. This leadership is also stated by other research regarding Facebook's market share (StatCounter, 2013) or the usage of communication behaviour in social media (Ebner and Nagler, 2013).

Therefore it seems to admit of no doubt, that Facebook represents the state of the art of present social media usage within the university context. This has been the reason for the decision to concentrate our statistical research on Facebook as a generic and exemplary social media platform. The following results apply to the use of Facebook as a social media facility for universities, the overall survey of the other two platforms observed in this study does support these results.

According to the statistical evaluation the research questions can be answered as described in the following chapters.

3.1 Are there Primary Influencers for the Engagement of Users in Social Media Posts?

The examined posting characteristics have been various. The user engagement doesn't correlate with a single factor of these characteristics. It is more or less the composition of characteristics that defines a good and efficient post. Nevertheless there have been characteristics that seem to be more important than others, with some of the categories having a significant correlation to the achieved user engagement while others have not.

3.2 Which Influencers can Be Identified?

Having those characteristics in mind, which have shown a significant correlation to the user engagement, the following influencers are identified:

- Time of publication
- Used elements
- Content characteristics (containing subject, function and time reference)

Time of Publication
Weekend and night posts get more user reaction than others, while morning posts get less.

Used Elements
The best combination of post-elements is sharing a text with a photo and a link. Videos don't seem to have a significant effect on the user engagement. For each of the other elements the results show that posts with a text, link or picture have better reactions than those without.

There is also a negative correlation between user engagement and uncommented pictures as well as messages without visual elements.

3.2.1 Which Characteristics Determine Relevant Content for Messages in Social Media?

Analyzing the content of the posts, the study shows that the content characteristics are highly related to the user engagement.

Posts with the inherent function of contact have higher engagement rates than all others. In second place fun posts get good reactions too.

While the research subject doesn't get good reactions, posts subjected to the university as a place to live and work in, as source for user identification, as well as posts subjected to a special group of the community like sport teams, clubs, etc. get significant higher engagement rates.

Regarding the inherent time reference of a post, messages with seasonal content and messages with recurring subjects like weekly sequels tend to have higher user engagement than messages announcing or reporting events.

3.2.2 Does the Frequency of Publishing Social Media Messages Influence the User Engagement?

The user engagement rates don't show an unambiguous disposition in terms of the frequency of postings of a university. There are slight differences indicating that more than 3 posts a day relate to a lower engagement for further posts. It also seems reasonable, that less than one post per week leads to a lower engagement rate as the interaction value included in the Facebook edge rank is calculated over the period of a week.

3.3 Comparison of University Efforts

The efficiency of university social media efforts has been evaluated with the fan base, the recent interactions (talk-about count of Facebook) and the overall size of the site an estimated interaction rate in mind, to provide a field of data, where single postings can be compared to others, even if they are made by another university with different prerequisites. Still there are significant differences between the universities. Some of the universities obtain consistently higher user engagement rates compared to their prerequisites and seem to perform notably better within the social media.

For example the Ohio State University also investigated in the study has got about 500 thousand fans at the beginning of the research period, hence gaining an average user engagement of ca. 1590 likes, shares and comments on a single post. Whereas bigger universities like Harvard University with about 2 million fans (four times the amount of the Ohio State University) just achieved an average of ca. 2060 reactions, or the University of Oxford with ca. 650 thousand fans (33% more than the Ohio State University) attained just an average of ca. 370 user reactions.

Observing the profiles of the universities, that did attain a better user perception we also recognized, that most of all they are strategically using the aforementioned posting characteristics, while others do not really vary their approaches and are chiefly posting research information through their social media channel.

This also confirms, what has been discovered earlier.

4 DISCUSSION AND SOCIAL MEDIA STRATEGIES

This chapter combines the findings of the statistical analysis of Facebook and the investigation of collected data from Twitter and Google+ in order to develop recommendations for an efficient social media strategy in academic environments.

During the study it became obvious that a university's social media account can't be filled fully automatic by periodically publishing news of recent research efforts or upcoming events. The results show clearly, that there is less interest on these topics in the social web. Users might take other media to inform themselves of these contents. Moreover it seems of relevance to deliver an accurate setting of content, taking into account the social characteristic of this media.

Therefore it is of great importance to publish contents that raise and maintain contact between the university and their stakeholders on a personal, maybe even emotional way (e.g. by using visual elements) which is proven by the higher engagement rate of the posts containing these characteristics.

Below we suggest a few examples how that could be achieved according to the results of engaging post characteristics:

- Presenting the university as a primary place to live and work in; (cf. post subject)
- Supplying opportunities to keep in contact with the university and the community, e.g.: referring to the history of the university, well-known places on the campus, community activities and collective community knowledge; (cf. post subject and post function)
- Accomplishment of social conventions, e.g.: congratulations, seasonal greetings, acknowledgements; (cf. post subject and post function)
- Providing Information, which is up-to-date, even if this means posting in the night, at weekends or holidays; (cf. time of publishing and time reference)
- Acknowledgement of achievements and providing contact opportunities within the community, e.g. congratulating student teams, sport teams, achieved awards; (cf. post subject, post function)

- Enabling user participation, where it isn't usual throughout other media, e.g.: topics of common interest, feedback possibilities; (cf. post function, time reference, post subject, etc.)
- Providing linking possibilities throughout sequels and recurring topics; (cf. serial posts)
- Posting some contents just for fun; (cf. fun posts)
- Avoiding information about research and event announcements or reports

5 CONCLUSIONS

Over all it can be pointed out, that it is good to support the ties of the community and to plead on loyalty and community spirit. Various contents should be used to get the advances of a diversified and rich social media performance by activating as much of the related users as possible. This study also seeks to prevent universities of overrating posting characteristics that have shown no significant relationship to the user engagement, for example the posting frequency or the text length of a message. Especially because the text length has previously been stated important by other studies like the Buddy Media Data Report (2012) or the Facebook content study of Reimerth and Vigand (2012) both investigating the use of Facebook pages for marketing and sales objectives of businesses. Therefore further research has to be taken, to clarify if aspects like the higher acceptance of longer text messages are only true for the sector of higher education or can be applied to other non-profit-organizations too. Regarding the other results – part of them also mentioned in the referred studies – it is reasonable, that these results are also reliable for a social media strategy for non-academic institutions due to the fact that the inherent business content of universities (research news) is less important to become a good social media player.

REFERENCES

Baer, J. (2013). *Social Media Strategy in 8 Steps*. Retrieved March 4, 2013, from http://www.convinceandconvert.com/social-media-strategy/social-media-strategy-in-8-steps/

Buddy Media (2012): Strategies for Effective Wall Posts: A Timeline Analysis. Retrieved March 21, 2013, from http://marketingcloud.buddymedia.com/whitepaper-form_review-strategies-for-effective-facebook-wall-posts-a-timeline-review

Ebner, M. and Lorenz, A. (2012). Web 2.0 als Basistechnologien für CSCL-Umgebungen. In Haake, J., Schwabe, G., &Wessner, M. (Eds.), *CSCL-Lernumgebungen.* München: Oldenburg.

Ebner, M., Nagler, W. and Schön, M. (2012). Have They Changed? Five Years of Survey on Academic Net-Generation. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2012,* 343-353. Chesapeake, VA: AACE

Ebner, M., Nagler, W. and Schön, M. (2013)."Architecture Students Hate Twitter and Love Dropbox" or Does the Field of Study Correlates With Web 2.0 Behavior*? ED-Media Conference*, 2013, accepted, in print

Evans, D. (2010). *Social media marketing. The next generation of business engagement* (1st ed.). Indianapolis: Wiley Publishing.

Gartner, Inc. *Gartner Identifies the Top 10 Strategic Technology Trends.* Retrieved March 2, 2013, from http://www.gartner.com

Honeysett, A. (2012). *Planning Your Social Media Strategy? Take a Cue from GE.* Retrieved March 2, 2013, from http://www.forbes.com/sites/dailymuse/2012/12/03/planning-your-social-media-strategy-take-a-cue-from-ge/

IEEE Spectrum (2011). *Special Report: Top 11 Technologies of the Decade.* Retrieved March 2, 2013, from http://spectrum.ieee.org/static/special-report-top-11-technologies-of-the-decade

Jochemich, M. (2013). *Is Your Facebook Page Performing Above The Average For January 2013?* Retrieved March 2, 2013, from http://www.quintly.com/blog/2013/02/infographic-facebook-page-performance-2013-01/?utm_source=Infographic&utm_medium=Infographic&utm_campaign=20130219_FB_PageBuckets_01_2013&r=25

O'Reilly, T. (2005). *What Is Web 2.0.* Retrieved February 25, 2013, from http://oreilly.com/pub/a/web2/archive/what-is-web-20.html?page=1

Porterfield, A. (2012). *3 Steps to an Effective Social Media Strategy.* Retrieved March 3, 2013, from http://www.socialmediaexaminer.com/3-steps-to-an-effective-social-media-strategy

Reimerth, G. And Wigand, J. (2012). Welche Inhalte in Facebook funktionieren. Facebook Postings von Consumer Brands und Retail Brands unter der Lupe. Retrieved March 21, 2013, from http://www.knallgrau.at/facebookcontentstudie

StatCounter(2013).*StatCounter Global Stats. Top 7 Social Media Sites in Europe on Feb 2013.* Retrieved March 3, 2013, form http://gs.statcounter.com/#social_media-eu-monthly-201302-201302-bar

Tarbaj, C. (2013).*Understanding Facebook's EdgeRank.* Retrieved March3, 2013, from http://socialmediatoday.com/ node/1205641

What Is EdgeRank? (2013). Retrieved 3 March, 2013, from http://www.whatisedgerank.com/