

Analysis of Personal Learning Networks in Support of Teachers Presence Optimization

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Abstract. The activities of teachers in social networks have a certain place in their personal advancement and professional progress. Studying the organization of Personal Learning Networks (PLN) could support the optimization of teachers' efficacy and productivity. For this purpose, an analysis is performed after a literature review and taking into consideration the opinion of the international educational society including teachers from Primary schools, High schools and universities. The received data shows very different PLN structures consisting of preferred and favorite social networking sites, online authoring tools, search engines, software for communication and collaboration, socially-oriented learning management systems. Most often used and very popular among teachers are the social networks Facebook and Twitter that are studied in detail in the form of friends number, reasons for adding/excluding someone from friends' list, frequency and directions for usage, influence on personal efficacy, impact on teaching practice. All gathered data and performed analysis result in a created model for social teachers' presence optimization.

Keywords: social networking, personal learning network, personal learning environment, teaching practice, optimization

1 Introduction

Social networks appeared as an opportunity emerging as a result of the progress of information and communication technologies and as a need of reliable connection and successful dialog among people with similar interests. The geographical boundaries are removed and the gates for huge knowledge are widely opened. Everyone could be a founder and moderator of social networks thanks to Web 2.0 developed tools and social

software with flexible user interface. In our society a culture of sharing, promotion of new ideas and connection is realized. The process of socialization is facilitated through different forms of web-based communicative and collaborative activities. In the same time the instruments for personalization are enhanced giving a chance for the construction of the individual nature of every single person and the expression of personal capabilities. The phenomenon of a networked world with personalized features has a strong impact on teachers' behaviors who grab this possibility for self-elaboration, improvement of teaching activities and collaboration.

As a consequence of supporting learning and satisfying personal requirements, the terms Personal Learning Environment (PLE) and Personal Learning Network (PLN) arise. The term "learning network" is come to describe the gained experience of students and teachers when they utilize computers for learning [1]. The practice shows that social software and social networking sites are often utilized for the organization of learning networks. Thus social interactions among participants could support learning process in social environments specially created or utilizing the functionality of existing social sites and software.

Another term "personal learning networks" has recently emerged to describe "the sum of all social capital and connections that result in the development and facilitation of a personal learning environment"[2]. The author depends on social media, software and sites like blogs, wikis, social bookmarking sites, photo and video sharing sites, microblogging to assist teaching and learning via the formation of an effective personal learning network. Obviously, the social interactions of every one person in a socially-oriented online environment in support of his/her currently emerged or future planned needs for learning play a very important role for the shaping of individual features.

In this paper a detailed examination of the process of personal network building at the teacher's workplace is done as a basis on empirical data and studies. At this moment such analysis is not performed and there is a necessity of understanding the static and dynamic view of different personal learning networks through their transition states and final effects. Thus, the main research questions are formulated as follows: "Whether and how a personal learning network could facilitate the teacher's practice?", "What is the dependence between network structure and the teacher's efficacy?", "How a personal learning network could be optimized to stimulate the teacher's productivity?"

2 Used Method

To gather answers to the posed research questions we started with literature exploration about the impact of social networking and social media on personal and professional development. We are especially interested in research reports and scientific papers with experimentations focused on teachers' online presence forming and its benefits.

A tool for data collection from teachers is created in the form of a survey to understand teachers' engagement and motivation for participation in social networks, to comprehend the ways of personal learning network building, to catch up the purposes of use. The received research data is utilized for a model creation to support the teachers practice in the directions of personal learning network optimization and further

elaboration. The specific networked structures and variables related to members' profiles, relationships, connections, generated content, produced artifacts, time of existence are examined.

3 Literature Review

A report of collaborating organizations like: edWeb.net, IESD, Inc., MMS Education, and MCH, Inc. summarizes the findings about personal and professional usage of the social networks Facebook, Twitter, MySpace and LinkedIn and platforms like Ning, Google Docs, Wiki, Moodle by school principals, librarians, teachers and students. Among the benefits of social networks for education are: information and resources sharing, professional learning communities' creation, improvement of school-wide communications with students and staff [3]. 70% of the librarians, 62% of the teachers and 54% of the principals participate in one or more social networks.

Relationship between professional development of educators and social media use is examined in [4]. The social media potential for improvement of teachers' quality and performance is identified through case studies and through presenting the social media benefits for business.

Higher education adopts social networks too making various good practices weaving learning scenarios, social software and sites in different educational forms. For the purposes of distance learning, Ning is utilized to support topics discussion in the framework of each one of the courses, community of practice forming and students' social presence building [5]. The results from this study point to the advantages of social network for engaged educational community ranging from "increased levels of communication and collaboration to deeper levels of reflection".

Exploration of social media personal and professional use by higher education faulties is done in [6]. Findings reveal that educators in personal context are active users of Facebook, YouTube, LinkedIn, blogs, wikis, Twitter, etc. In support of profession- al progress and teaching practice 90% of them have a stake in social media. The first most used social media sites in personal and professional aspect are Facebook and Youtube.

The role of microblogging for personal development and organization of social networking is being researched in [7] and several possible learning scenarios are proposed.

These and other good practices that are not included in this review show that the teachers are active participants in social networks striving for new knowledge and connections on one hand and on another hand they like social software and success- fully apply it in their teaching practice.

We also have to remember the importance of scientific events dedicated to the PLE/PLN concepts like the conferences from Barcelona, Spain (2010) and Southampton, UK (2011) where an impressive number of scholars from whole over the world participated.

4 Personal Learning Network Analysis - Survey Results

Social network analysis (SNA) is a method for understanding the formal and informal relationships in a social network (its structure) and how connections could facilitate or hinder knowledge gathering and learning occurring [8]. There are a wide variety of methods for SNA and one or other is applied according to the characteristics of a given network, context and situation. For example, the web crawling method is utilized for analysis of online social networks like Flickr, YouTube, LiveJournal and Orkut. It is suitable in the situation when the users' data is not directly accessible and only the available public interface of sites is reachable [9]. Content-based SNA is chosen in [10] for the reaching data from mailing lists. In this method a network is divided in subgraphs organizing participants according to the discussed topic. Personal network analysis is performed in [11] to explore the structure of relations among young people and to find the connections in personal networks and discourses.

In our study we have teachers who participate in different social networks, who use a wide variety of social learning platforms and who have specific individual interests. Hence, the above mentioned methods for SNA differ from our situation where we have to study every PLN consisting of several social networks. For this purpose we prepare a survey with questions grouped into three categories related to: current PLN structure, its dynamic view and regular usage for personal development and for educational purposes. This survey is distributed to teachers from Primary schools, High schools and universities over the world.

41 educators (59% female and 41% male, with average ages of 43) from 12 nationalities responded to our request and took part in this research. Concerning the field of teaching disciplines, 39% of the teachers present subjects related to Computer Science, Information Systems and Mathematics, 17% teach Educational Technologies and eLearning, 15% are teachers in Language learning as a foreign language. Even the percentage of teachers in Natural Science, Humanities, Social Science, Entrepreneurship and Business, Journalism and Primary school teachers was low, they also expressed their willingness to participate in the survey, presenting their interest to social software deployment in educational settings and declaring their coherence to the PLN topic. The results show that 98% of surveyed educators use social networks in their personal learning networks as follows: 78% utilize Facebook, 76% like Twitter and 68% have accounts on LinkedIn, with smaller percentages of interest are Classroom 2.0, Tuenti, Goggle + and others (Figure 1).

As it seen the main ingredients of educators' PLN are social networks with Facebook (93% of the educators have mainly one Facebook account and several of them possess two accounts - respectively for personal and for professional use) and Twitter (90% of the educators benefit from the Twitter stream) on top. Thus, the importance of these two social networks for the teachers' practice is explored in detail to understand whether and how they support personal and professional development.

The major group of educators opened their Facebook (39%) and Twitter (32%) accounts three years ago. Nowadays, the use of these networks is routine: 26% of the educators daily visit their Facebook journals, 24% continuously stay on Facebook, 16% several times a day check what happens on the Facebook wall, 27% of educators

continuously trace the Twitter stream, 19% participate several times a day and another 19% daily tweet. A small part rarely uses Facebook (8%) and Twitter (14%).

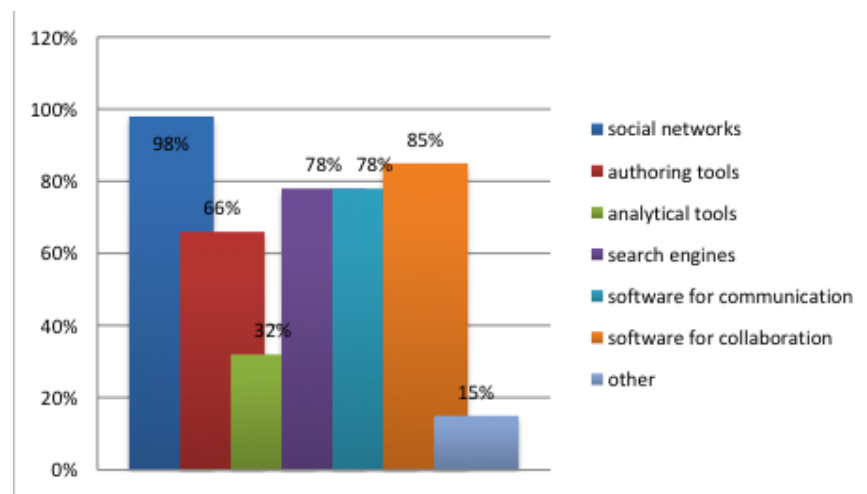


Fig. 1. Social software use in PLN

The main purposes of Facebook and Twitter utilization are related to sharing (63% for Facebook and 81% for Twitter) and learning new things (50% for Facebook and 81% for Twitter). Other reasons are related to: making friendships, keeping connections with family and friends, self promotion, opening channels for communication, events following, networking.

The created personal networks' societies are not so big: on Facebook 20% of educators are connected with 301-400 friends, 15% possess between 201-300 friends, 15% have 101-200 friends, other 15% communicate with 51-100 friends; the number of friends that educators follow on Twitter are among 100-200 (in 18% of cases), 201- 400 (18%), less than 11 friends (18%), more than 900 (12%). The Facebook educators' network is mainly built from real people who they know or have met in real life, colleagues and family members. The Twitter network in common line consists of colleagues, real friends and interesting people in a professional aspect who are not known to them in real life. 45% of the teachers rarely extend their Facebook network with a new friend and 42% of them sometimes decide to do that through search tool (37%), recommendation tool (34%), web sites functionality (34%) or just accepting somebody else's request. On Twitter the network expansion occurs with bigger frequency: 58% of teachers sometimes follow a friend, 19% rarely do that and 17% often connect with a friend using the recommendation tool (54%), search tool (43%), web sites functionality (41%), cascade following mechanism (following people from re-tweets and following people followed by someone important person). Educators like to follow interesting people for them: authors of scientific papers and articles, professionals and keynote speakers met at conference places, new people found through re-tweets and stream line, people that are recommended by someone else. The reason for Facebook network expansion in 71% of cases is keeping the

contact of an interesting person that is met. The Twitter network is extended when a person is interesting in 62% of cases and when there is a need for learning something new (49%). On the two networks Facebook and Twitter, the friends are rarely or some- times removed. On Facebook it happens when a friend is annoying (34%), when a person is not interesting anymore (29%), in the case when anything new cannot be learn from this friend (18%), “when a friend continually offensive posts on the wall”, “when a person is responding badly”, “when the academic relationship with students/ex-students ends and it does not extend into friendship”. Twitter network is shrink in 46% of the cases when something new is not learnt, when the friend is not yet interesting (30%), the person is annoying (30%), “when a person tweets too much,” “if the person is a sales-based entity,” if the messages are in languages that the educator does not know, if the messages are spam, after unfollowing, when the tweeted opinions start to feel uncomfortable for the educator. The number of friends and the basic type of friends in networks as well as the frequency of friends’ adding and removal are evidence for the not so big dynamics in teachers’ PLN. Many of them prefer to very carefully select and accept friendships, taking advantages of their knowledge in the long term, avoiding their removal in rare situations. The educators do not consider that the number of friends in PLNs could influence on their efficacy as a person and as a teacher.

43% of surveyed teachers agree that Facebook could support their personal and professional development (Figure 2) and 62% of them share that Twitter is a suitable network for both personal and professional capabilities improvement (Figure 3). The question about social networks usefulness for personal life and career progress is left opened for 4 choices to gather the all views of teachers. According to that, the Face- book is pointed as a preferred network for a personal development (by 19% of the educators) and Twitter is defined as a tool for professional development (by 35% of the educators). Anyway, 32% of the Facebook users and 16% of the tweeting educators suppose that these networks could not facilitate their development in personal and professional aspect.

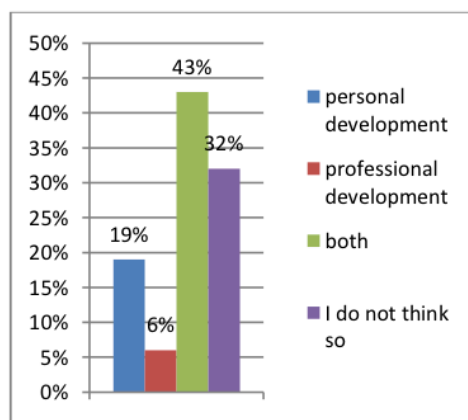


Fig. 2. Do you think that Facebook supports your personal or/and professional development?

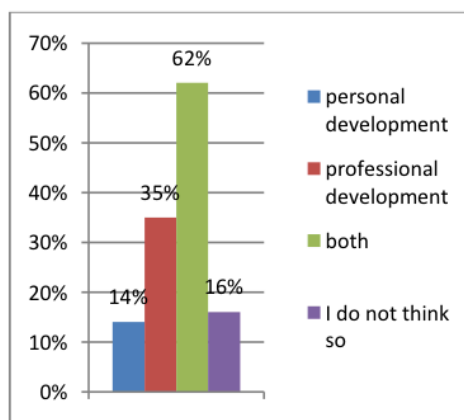


Fig. 3. Do you think that Twitter supports your personal or/and professional development?

The teachers are asked to evaluate the social networks' importance for the facilitation of the teachers' practice and students' learning. 51% of them agree that Facebook could be used for educational purposes and 70% recognize Twitter as a powerful tool for teaching and learning. Resources and links sharing, announcement of class events, giving opinion, stimulation of class discussion, communication, polls taking are among the performed activities on Facebook and Twitter. 53% of the educators using Facebook and 68% of the twitting educators like active participation as well as observation and tracking. 32% of the educators share that they are more observers than contributors on Facebook. The gathered opinion about Twitter divides the educators in equal groups of observers (in 14% of shared vote) and contributors (also 14%).

Some of the advantages and disadvantages of the explored two networks in a personal and professional context according to surveyed educators are summarized in their own words in Table 1. Among the advantages most cited are found: the possibility for connection and community of interests forming, sharing, ideas exchanging, learning, communication and collaboration. Disadvantages address the issues related to ethics, behavior culture, privacy, overload of information and time consuming. It is obviously that social networking possesses positive and negative characteristics and educators have to endeavor to balance them taking the power of benefits. Educators need to optimize their online social presence to be successful in their personal being and professional practice.

Table 1. Advantages and disadvantages of social networking

Facebook Advantages	Disadvantages	Twitter Advantages	Disadvantages
"I can connect with people far away and whom I cannot approach through phone calls"	"Lack of integrity and ethics in the ownership of the company"	"Growing as a learner / a better communicator / improving my teaching styles"	Time consuming / missing important information / too large the PLN
"It helps me to share my proud/emotional moments (personal and professional) with my loved ones"	"The disadvantage I see on my "teacher site" is that young people feel free to say rude things"	"Brings down barrers between student/teacher, which can be both beneficial or not, depending on the respect and the relationship"	"Can be addictive" "Overflow of information"
"It also helps me to exchange ideas with each other"	"I don't like Facebook - lack of privacy"	"It is very easy to learn so many new things and communicate with inspiring teachers from around the world"	"It can be very time consuming"
"I create a group , share information and find resources"	"There's too much information and not all of it is appealing;	"Instant communication"	"Spams, at times"

	sometimes I just waste time browsing and I feel gossipy and I don't like it"		
"I learn a lot from and about my friends"	"I have no control; can't use it as a way of getting students to focus"	"Immediate feedback to followers and friends"	"Can't keep up with tweets"
"Good for swapping ideas, and mutual support though"	"Privacy issues; questionable corporate culture and practices; breaks the web; silo; navigation issues; bad archiving"	"Connect to interesting people"	"Addictive, consumes much time"
"It is a creative way of sharing, communicating, and collaborating"		"Connecting, networking, sharing; just-in-time, updated information"	"Lack of a good archive; poor conversational potential; 140 character limit; URLs in message and not in metadata"

So, the participants are asked to suggest the directions for their social networks optimization with aim to be more effective and productive persons and professionals. The gathered opinions are summarized in Table 2 and they prompt the following methods: (1) using the automated functions of social networking sites and related to them client software; (2) self-control of individual behavior (in connections making, groups joining, spending time); (3) recognizing the characteristics of learning (learning by suitable behavior, continuously learning, learning in social environment).

Table 2. Suggestions for social networks' optimization

Facebook	Twitter
"Looking for interesting groups to follow"	"Creating lists, using hashtags to follow, imposing a time-discipline in following the informational stream, follow only interesting for me people"
"Regular checks on posts by others, block a few sometimes"	"Use twitter lists and email notifications", "instant communication", "Use hashtags", "post everyday"
"Add interesting people"	"I always use a column system like Tweetdeck I create columns to follow certain hashtags and certain people"
	"Feed it to Flipboard in iPad where I can flip through and read the tweets magazine style" "I follow educators and look to see who they follow"
	"I try to find new, interesting people to follow, I use Hootsuite to manage the Twitter stream"

5 Discussion

Findings point out the potential of PLN and social networking for the development of teachers in a personal and professional perspective. PLN supports their learning and teaching through the possibility for resources and links sharing, learning through activities or through observations, class events announcing, class results announcing, and stimulation of class/group discussion. For the optimization of teachers' social presence we created a model allowing continuous PLN improvement according to the changing personal and learning requirements with items connected to individual behavior, social networks functionality members' profile, characteristics of teaching/learning process, spending time (Figure 4).

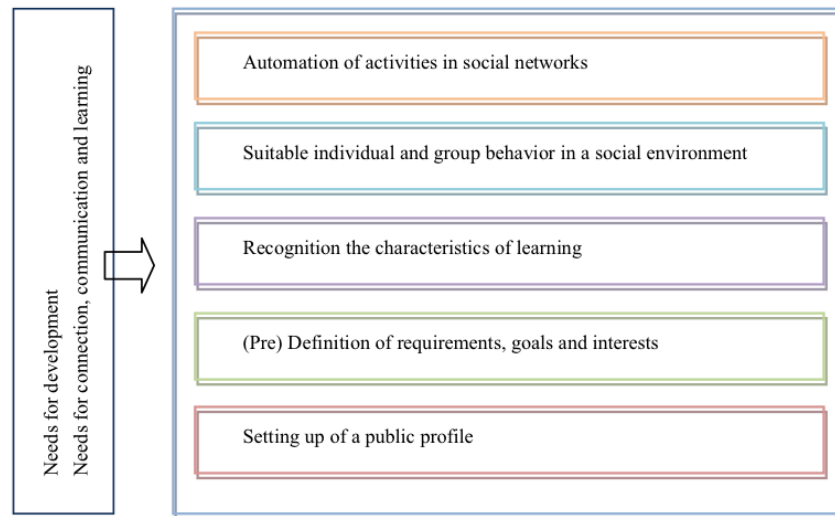


Fig. 4. Model for PLN optimization in a teachers' presence

This model includes five main criteria that could be referred as starting points in PLN evaluation and optimization. They take into consideration: (1) the importance of a well defined public profile that could facilitate educators in their connections making, promotion and suitable friends' recognitions, (2) the identification and definition of current requirements, goals and interests in networks participation as well as these in a long term in a clear manner that could save time and energy in doing aimless activities, (3) the characteristics of (social) learning, what kind of learning best suits his/her nature, mood, style, background and how this is related to social possibilities of net- works, (4) the appropriate model of individual and group behavior rendering the networks' dynamics and specificities, (5) the opportunities for automation of several activities in information and friends searching, selecting, filtering, tracking, and management.

6 Instead of Conclusion

This research including PLN study of teachers is the first step of future explorations concerning the analysis and optimization of PLN in support of efficacy use and productivity improvement. Most of the teachers like the networked world and wish to develop a sustainable social presence. It will work for them only if their personal preferences and social behaviors in networks are well studied and understood. It also influences other PLN factors like static view, structural dynamics and taking time. The model is created in order to indicate the opportunity for PLN advancement and to support the quality of the teachers' participation.

Furthermore, a PLN remains a personal choice for most of the educators. However, the authors strongly believe that to use or not to use PLN for personal and professional development will soon become an obsolete phrase for the large mass of educational actors.

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