Adoption of Social Media in Learning: a Student Perspective

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Abstract

Traditional challenges in the relationships between IT departments and business units, such as a low governance and service transparency, commercial challenges including low response time and limited re-use, lack of customer orientation, and poor quality of IT support are no longer accepted by users. IT departments need to actively adopt entrepreneurial mindsets to meet the new market requirements. Some researchers argue that the responsibility for application software is shifting from IT professional development to the users of the software. It also seems that the IT professionals lack commercial skills to deliver and maintain IT solutions for customer satisfaction and added business value.

This paper discusses potential solutions regarding how IT departments can become more business focused by aligning business activities to organisational strategy and by defining and measuring specified value objectives. It also emphasises that IT professionals must become more entrepreneurial and aware of user needs and costs.

Keywords: Social Media, IS/ICT learning, Technology Adoption

1. Introduction

Technology enhanced learning has become a fundamental part of Higher Education (HE) in recent years. Rapid advances in ICTs have introduced easy access to services and new electronic learning environments. Social Networking Sites

(SNSs) present a new channel for communication and collaboration by individuals [1]. People use SNSs to interact with each other within a common information space and participate in diverse interactive and social activities, such as posting content, sharing pictures and videos, tagging and organizing events [2]. The foundations of social media are communication, collaboration and sharing. Social networking sites are able to increase the engagement of the students in an online learning community as they offer a technology which is well-known among their generation [3]. While initially younger individuals used SNSs, such as Facebook, older people have recently become actively involved in using SNSs [4].

As a result of the underlying tendencies in practices related to SNSs, learning to learn seems to be considered to have greater impact on future experiences than the construction of domain specific knowledge itself [5]. Learning how to identify and initiate, support and maintain, but most importantly to exploit these learning environments, is a key skill for successful learners and educators in the 21st century. However, despite the many contemporary technologies that support collaboration among distributed students, there are still considerable difficulties building online work environments. By far the most important and the most difficult aspect of effective knowledge sharing and learning in online work environments seem to be concerned with people, pedagogy, processes and culture [6]. Such online work environments in teaching and learning contexts embrace mostly students who are enrolled on a distance mode course or students who perform group tasks outside the university space as home-work.

The use of social media in education is rapidly expanding. Social media in education has the potential to enable new pedagogic student-centred ways through their bottom-up approach for supporting knowledge activities that harness collective intelligence unlike the hierarchical teacher-centred approaches [7].

According to the Seaman and Tinti-Kane's survey [8], 59% of faculty members agree that by using social media better learning can be achieved. At the same time 56% of faculty members consider that these technologies can be distracting in education. Because of this disharmony concerning the role of social media in education we should comprehend that social media tools are technology tools and applications similar to business or office software [9].

Social media adoption in education needs deeper investigation. Innovative technologies (infrastructure as well as applications) are likely to follow the same cycle of diffusion as other innovations and their adoption. New generations of students, and in particular IS/ICT students, are likely to belong to the category of early adopters as defined by Rogers [10] in his innovation adoption theory and illustrated by among other Keesee and Shephard [11] as self-adopters [9, 12,13].
This paper discusses the opportunities and challenges presented the fast growth of social media in general and in educational use of social media in particular. Emphasis is put on the readiness for social media adoption in education. For this analysis we considered university students' opinions concerning this matter. The search presented in this paper identifies and ranks important factors in the adoption

and use of social media in Information Systems (IS) / Information and Communication Technology (ICT) education in particular.

2. Social Media in Education

Nowadays social media, and in particular Facebook are changing the attitudes and behaviors related to information and learning. Witek and Grettano [14] identified four effects of social media use on students' behaviors and learning practices, namely

"*Information now comes to users*" - manifested mainly through the feed functionality of Facebook;

"*Information recall and attribution are now social*" – students categorize information based on who shared the information with them;

"*Evaluation is now social*"- the value of information students encounter online is directly related to how others in their networks value that information and whether the information is relevant to their friends;

"*Information is now open*" – Users within participatory information environments are both publishers and authors simultaneously. Their information literacy practices are constantly on display and thus shaping their visible identities.

Social networking practices have the potential to be effectively applied in teaching and learning, and bring about advantages in learning. Godwin [15] for example, point on the potentials Web 2.0 environments for active, collaborative and reflective learning. However, integrating these innovative and contemporary practices seems to be a slow process that is likely to encounter resistance by educators, first of all, due to their previous experience as traditional learners and teachers. Another obstacle originates from the established educational structures which do not encourage new ways of teaching and learning. Also educators may not have the necessary skills for implementing networking practices. In general educators who are not 'digital natives' and are inevitably the product of traditional learning and teaching, are likely to be reluctant to learn and incorporate new technologies in their teaching [7].

Seaman and Tinti-Kane [8] have studied the use of social media in teaching and learning. The positive impact on learning communities is significant based on the volume of social media use. Especially blogs and Wikis have significantly affected teaching activities, whilst podcasts, LinkedIn, Facebook and Twitter are less significant. Another side that requires investigation is the quality of learning. According to Lau et al. [16] studies show the significant effects on the quality in learning in terms of learning performance and motivation.

The real benefits of social media in learning are based on understanding learning theories. Social constructivist theory explains how and why social contacts and interaction are vital for learning [17]. The terms constructivism and social constructivism tend to be used interchangeably and are included under the generic term '*constructivism*' by Charmaz [18]. Constructivism proposes that '*each*

individual mentally constructs the world of experience through cognitive processes while social constructivism has a social rather than an individual focus' [19]. Social Cognitive Theory (SCT) provides the foundation for understanding how social media usage emerges from a reciprocal relationship between personal factors, behaviours and the environment [20]. Applied to social media use, SCT suggests that learning about diverse social media technologies may result in new thinking and/or modified sense of self [21]. Subsequently, based on the new thinking and/or new self-concept teachers and students may start using the social media in a different way. Building on the Expectation Discomfort Theory (EDT) [22, 23] and the Channel Expansion Theory (CET) [24] help to explain the impacts of learning as it relates to social media. EDT describes a process in which exposure to information about a certain social media technology (environment) leads to beliefs (cognition) regarding the technology. CET, a communication media selection and usage theory, helps us to understand the communication style that is used in social media. Carlson et al., [21] applied EDT and CET to a sample of 220 working individuals and found that increased intensity of social media use contributed to greater task oriented and relationship-building social media behaviours.

Connectivism as a learning theory that clarifies the current technical point of view in which human beings are more connected through using different media and social media [25].

Mattar [26] argued that "*Connectivism or distributed learning is proposed as a theory more adequate to the digital age, when action is needed without personal learning, using information outside of our primary knowledge. Learning theories should be adjusted in a time in which knowledge is no longer acquired in linear manner, technology performs many of the cognitive operations previously performed by learners (information storage and retrieval), and in many moments performance is needed in the absence of complete understanding. Learning is no longer a process that is entirely under the control of the individual, an internal, individualistic activity: it is also outside of ourselves, within other people, an organisation or a database, and these external connections which potentiate what we can learn, are more important than our current state of knowing*". Similarly, Dunaway [27] postulates that "*Connectivism posits that learning takes places when learners make connections between ideas located throughout their personal networks, which are composed of numerous information resources and technologies*".
Thus it is evident that social media in education relies on creating the environment which will enable learners to use available technologies and materials, connect ideas and interact with other learners.

3. Technology Adoption Theory

Various theories deal with technology adoption. Diffusion theories of technology can partly explain the drivers of social media adoption. The first diffusion theory for technology innovations includes the innovation diffusion theory described by Rogers [10]. This theory was developed in the 60s and considers the adoption of an

innovation as a social process. The next explanation for technology adoption is the Theory of Reasoned Action (TRA). TRA has its background in developing technology diffusion and adoption theories [28]. According to this theory, a person's activity is the result of their attitude and personal norms. A person's attitude is based on values and beliefs. According to Hofstede [29] values are the deepest level of culture and often unconscious to the person holding the value. The personal norms are based on motivation to act according to accepted norms. The Technology Acceptance Model (TAM) model by Davis et al. [30] discusses practical technology use issues. TAM emphasises usefulness in addition to user friendliness. Later theories have been modified and expanded. Mathieson et al. [31] emphasise that the TAM model should be expanded by adding available resources.

Venkatesh and Davis [32] expanded TAM further to include the concept of perceived usefulness. This model is called TAM2. Subsequently the Unified Theory of Acceptance and Use of Technology (UTAUT) was presented by Davis et al. [30]. The UTAUT theory deals with the social aspect which is a notable factor in the emergence of social media in various areas including education. Figure 1 shows the major components of the UTAUT theory.
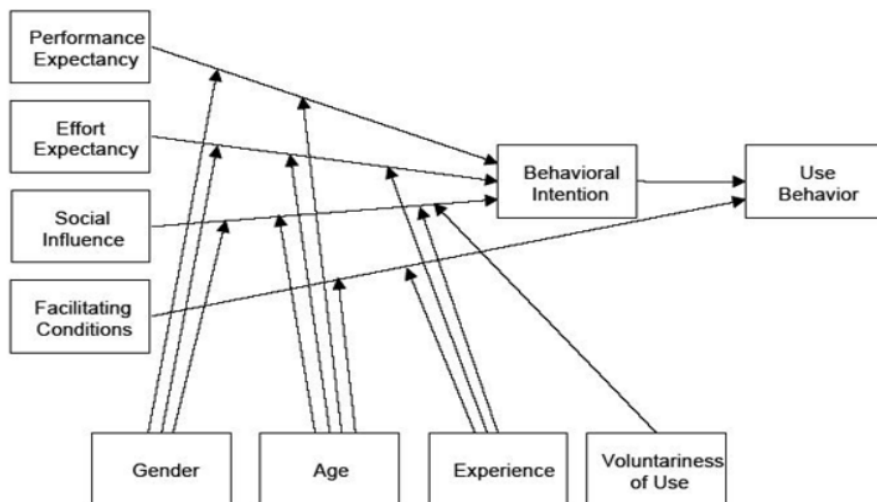

Figure 1: Unified Theory of Acceptance and Use of Technology [31]

Previous studies on individual-level adoption of SNSs showed that trust, normative pressure, underlying beliefs, privacy and security, personality, local network structure, perceived encouragement and perceived orientation, culture etc. play important roles in adoption of SNSs at an individual level [33, 34, 35, 36, 37].
We selected the UTAUT theory for this study and paper, because it covers issues relating to adoption and the various drivers affecting it.

4. A Social Media Adoption in Learning Survey

The literature review revealed various factors and issues including the diffusion theory concerning the use of social media. These insights informed the design of a questionnaire for capturing responses from students of IS and ICTs. Being computer literate we assumed that they will be early adopters of social media both in their studies and their life in general. We also assume that male students are earlier adopters than female students due to the fact that Computing and Engineering have been traditionally male dominated professions [38].

Thus we assume that:

H1 : IS/ICT Students are early adopters of social networks; and

H2: Male students are earlier adopters of social networks than female students.

In our study we explored what is important to the adoption of social media in education based on students' views. The aim was to find out what instructors should look at, especially when creating social media based learning activities for their students. In this it is important to know what promotes the use of social media and what impairs it.

Derived from the UTAUT theory the major variables in our study were:
- gender;
- age;
- experience in social media in general;
- voluntary use of social media;
- infrastructure use of social media;
- social influence;
- ease of use of social media applications;
- help of social media in a job or study.

4.1 Demographic Data

The questionnaire was completed by 71 IS students from the University of Jyväskylä, Finland. The demographic data showed that 20 were females and 51 males, with a mean age of 25 years (age range 19-57 years). The respondents rated each item of social media use on a scale of 1 to 5 where (1= not significant and 5=significant).

4.2 Analysis of the Data

Table 1 shows the frequencies of the responses concerning the variables of the study.

Table 1: Frequencies of the main variables of the study

Factor	1	2	3	4	5
Experience	Voluntariness	The effect of	The effect	The	The effect

in the use of social media	in the use of social media	infrastructure on the use of social media	of social influence on the use of social media	effect of the ease of use on the use of social media	of the help to work or study on the use of social media
3.65	3.72	4.24	4.04	3.96	3.33

The Kolmogorov test showed that the data based on the responses of the students concerning the themes of the issues in our study agreed with the normal distribution.

Table 2 shows Pearson's Correlations of variables in Social Media Adoption

Table 2: Pearson's Correlations of variables in Social Media Adoption

	Age	Experience in the use of social media	Voluntary in the use of social media	The effect of infrastructure on the use of social media	The effect of social influence on the use of	The effect of the ease of use on the use of social media	The effect of the help to work or study on the use of social media
Age		-.339 .004					-.270 .027
Experience in the use of social media	-.339 .004		.527 p<.001	.429 p<.001	.241 p=.044	.319 p=.008	.320 p=.008
Voluntary in the use of social media		.527 p<.001		.417 p<.001	.279 p=.019	.425 p<.001	.353 p=.003
The effect of infrastructure on the use of social media		.429 p<.001	.417 p<.001				.388 p=.001
The effect of social influence on the use of social media		.241 p=.044	.279 p=.019			.282 p=.021	
The effect of the ease of use on the use of social media		.319 p=.008	.425 p<.001		.282 p=.021		
The effect of the help to work or study on the use of	-.270 .027	.320 p=.008	.353 p=.003	.388 p=.001			

social media						

The results show that those who are experienced in social media like to use social media for different purposes. For these persons the infrastructure issues are the most important ones. Social media is a contemporary everyday tool that has attracted more than one billion users worldwide and is still undergoing remarkable growth [39]. Consequently, when infrastructure is not meeting user requirements it can limit the use of any tool. The results reveal that that we should promote the use of social media as a tool for improving learning, but simultaneously we should ensure appropriate infrastructure for social-media-based learning as the primary factor in setting up education based on social media.

The second and the third factors considered important by the students are the ease of use and the help social media provide towards working or studying. The fourth important factor is social influence. Human learning and development are strongly affected by social influence and content. Blaye and Light [40] argue that learning is an individual process through which a person can benefit or not, according to the interaction with other learners. Therefore, improvement can be obtained via communication of the problem among learners. This can positively affect reflection and planning. Witek and Grettano [14] identified that students categorize information based on who shared the information with them. Also the value of information that students encounter online is directly related to how others in their networks value that information and whether the information is relevant to their friends. These findings seem to be important and need to be further investigated in order to understand the social influence on the adoption of social media.

To find out the effect of gender on the adoption of social media we ran the T-test in which we compared the ratings given by female to the ratings given by male respondents. We found a significant difference only in the general experience in social media, in which males were more experienced than females (mean value was 3.80 for males and 3.25 for females, the p value was .022). This is in line with previously published results concerning the use of social media services [41].

5. Summary and Discussion

Changing pedagogies and the emergence of web-based technologies generate the necessity for more effective two-way communication, promoting interaction, knowledge sharing, collaborative working and flexible participation.

In recent years, the pace of new social media development and use is growing very rapidly. Students are fascinated by social media; they use them in their everyday lives, so they are eager to use them as part of their learning. Students prefer to receive information from multimedia, want to learn by voice and pictures rather than by reading texts. They want useful and direct learning, simultaneous interaction, knowledge sharing and self-organisation. They prefer group activity, active involvement and they are social.

Social media are a 'cool' new fashion and are likely to change the way teachers teach and the way students want to learn. They can enable students and educators

to create their own content and share it with a broad network of individuals. Social media provide to students and educators an unprecedented way to access, socialize, communicate, speak, publish and co-create.

With the advent of MOOCs the pedagogic debate concentrates on learning design to support independent learning. Connectivity in MOOCs is usually provided through conventional computer mediated communication media such as discussion fora (mostly unmoderated or lightly moderated) and through social networking. Web and social media tools (such as wikis or blogs and social networking) are now as central to learning as the lecture theatre and campus infrastructure in a traditional university campus [42, 43].

Due to the emergent new media it is important to review the whole educational system. It is generally acknowledged that good education requires a two-way connection with students. Our conviction is that there is no better way of communicating with students than with their own language - the social media. Universities should seek to incorporate social media into their curricula. This requires careful thought and research in order to find the best way to leverage these new tools to enhance teaching and learning activity. Educators should become innovators in education, to experiment with different technologies and to choose the most appropriate technology to incorporate into their lectures. Social media can be a useful supplement to technology enhanced learning. They can be used to facilitate the learning outcome by encouraging informal learning, supporting reflection and fostering communication as well as collaboration.

The results show the meaning of the different aspects of the Unified Technology Adoption model when applied to the adoption of social media in education. However, as our results show, the first priority is the need to pay special attention to ICT infrastructure before implementing social media solutions. Another issue is that we are not aware of the conditions at home. Thus, the learning conditions of learners should be analysed as the first step in outlining new learning activities based on social media. The second issue is selecting the best platforms in the light of usability. After this an educator should discuss how e-learning on social media should be organized that it would support learners' development is work or studies. The study by Seaman and Tinti-Kane [8] deals with different tools of social media as well. We also included these tools in our study, but the results presented in this paper do not deal with these details.

6. Future work

The study will continue with emphasis on two new approaches, namely (a) assessment of individual differences in learning profiles, such as learning styles and learning preferences, for identifying the compatibility of the student with a particular learning environment and (b) comparison of the outcomes of similar problem-based approaches in different cultural contexts. The motivation for the second approach is that the authors from own experiences are convinced that different cultural contexts bring about differences in assumptions about learning, the expectations that learners have regarding learning and teaching, the teaching

model itself, the relationships between educator and learner, the way the technology itself is experienced, the pedagogical aspect, the design of online courses and the way in which individuals and groups communicate and respond to their environment.

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References

1. Abedin, B. (2016). Diffusion of Adoption of Facebook for Customer Relationships in Australia: An Exploratory Study, *Journal of Organisational and End User Computing*, Vol. 28, Iss. 1, Jan.-March, pp. 56-67.
2. Pallis, P., Zeinalipour-Yazti, D., Dikaiakos, M.D. (2011). Online Social Networks: Status and Trends, in A. Vakali & L.C. Jain (Eds.): *New Directions in Web Data Management 1*, SCI 331, pp. 213–234, Springer-Verlag Berlin Heidelberg
3. *Oradini, F., and Saunders, G. (2008). Social networking: Connecting students and staff. ALT-N Newsletter, 13.*
4. Boyd, D., Ellison, N. (2007). Social Network Sites: Definition, History, and Scholarship. *Journal of Computer-Mediated Communication,* 13 (1), article 11.
5. WEB 2.0 and Education (2009). *In iCamp project: How to Use Social Software in Higher Education handbook*. Retrieved February 13, 2016, from http://www.icamp.eu/wp-content/uploads/2009/01/icamp-handbook-web.pdf.
6. Siakas, K., Siakas, E., Georgiadou, E. (2013). Benefits and Challenges of Social Media in Learning: Learners' Viewpoints. *Proceeding of the BCS Quality Specialist Group's Annual 16th INternational Conference on Software Process Improvement - Research into Education and Training (INSPIRE)* conference, 3-5 Sept., British Computer Society, London, UK, 133 – 144.
7. Georgiadou, E., Makkonen, P, Siakas, E., Siakas, K. (2014). Benefits and Challenges of Social Media in Learning: A Cross-cultural Study, E-Learn *2014-World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*, New Orleans, LA, United States, October 27-30, 2014.Vol. 2014, No. 1, pp. 313–318.
8. Seaman, J., Tinti-Kane, H. (2013). Social media for teaching and learning. Retrieved from Pearson Learning Solutions website: http://www.pearsonlearningsolutions.com/assets/downloads/reports/social-media-for-teaching-and-learning-2013-report.pdf#view=FitH,0, April 30.
9. Makkonen, P., Georgiadou, E., Rahanu, H., Siakas, K. (2015). What promotes the adoption of social media in the teaching of IS/ICT and what constrains it? - Students' perspective, *46th Annual Meeting of the*

Decision Science Institute, Seattle, US, Nov. 21-24, available at http://www.decisionsciences.org/Portals/16/Proceedings/AM-2015//files/p1041144.pdf.

10. Rogers, E. M. (2003). *Diffusion of Innovations* (5th edition), New York: Free press.

11. Keesee, S.G. and Shepard, M. (2011). Perceived Attributes Predict Course Management System Adopter Status, *Online Journal of Distance Learning Administration,* 4 (1).

12. Makkonen, P., Siakas, K., Georgiadou, E., Rahanu, H., (2016) Adoption and use of social media in learning and teaching. A cross cultural case study. EdMedia 2016: *World Conference on Educational Media and Technology to be held in Vancouver, Canada*, June 26-30, 2016. http://aace.org/conf/edmedia/.

13. Makkonen, P., Georgiadou, E., Rahanu, H., Siakas, K. (2016). Adoption of social media in the teaching of IS/ICT: Comparing students to faculty members, *27th annual conference of the Society for Information Technology and Teacher Education*, (Site2016), Savannah, Georgia, US.

14. Witek, D., Grettano, T. (2014). Teaching metaliteracy: a new paradigm in action, *Reference Services Review*, Vol. 42, Iss. 2, pp. 188-208.

15. Godwin, P. (2009). Information literacy and Web 2.0: Is it just hype?, Program: Electronic library and information systems, Vol. 43, No. 3, pp. 264-274.

16. Lau, R. W. H., Yen, N. Y., Li, F., Wah, B. (2014). Recent development in multimedia e-learning technologies. World Wide *Web* 17 (2), 189–198.

17. Vygotsky, L. S. (1978). *Mind and society.* Cambridge, MA: Harvard University Press.

18. Charmaz, K (2006). Constructing Grounded Theory: A practical guide through qualitative analysis. Thousand Oaks, CA: Sage.

19. Young, R., Collin, A. (2004). Introduction: constructivism and social constructionism in the career field. Journal of Vocational Behaviour 64(3), 373-388.

20. Bandura, A. (1986).The social learning perspective: Mechanisms of aggression. In H. Toch (Ed.), *Psychology of crime and criminal justice* (pp. 198-236). Prospect Heights, IL: Waveland Press.

21. Carlson, J., Zivnuska, S., Harris, R.B.,Harris, K.J., Carlson, D.S. (2016). Social Media Use in the Workplace: A Study of Dual Effects, *Journal of Organisational and End User Computing*, Vol. 28, Iss. 1, Jan.-March, pp. 15-28.

22. Oliver R. L. (1977). Effect of Expectation and Disconfirmation on Postexposure Product Evaluations - an Alternative Interpretation, *Journal of Applied Psychology*, 62(4), p. 480.

23. Oliver R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions, *Journal of Marketing Research*, 17(4), p. 460.

24. Carlson, J.R.and Zmud, R.W. (1999). Channel Expansion Theory and the Experiential Nature of Media Richness Perceptions. *The Academy of Management,* 42 (2): 153–170.

25. Siemens, G. (2005). Connectivism: A Learning Theory for the Digital Age. *International Journal of Instructional Technology and Distance Learning* 2(1), 3-10. Retrieved from the Journal's website: http://www.itdl.org/Journal/Jan_05/article01.htm, April 30.

26. Mattar, J.A.(2010) Constructivism and Connectivism in Education Technology: Active, Situated, Authentic, Experiential, and Anchored Learning, Boise State University, 08/2010 – version 1.0 http://www.joaomattar.com/Constructivism%20and%20Connectivism%20in%20Education%20Technology.pdf (retrieved on 20/02/2016)

27. Dunaway, M.K. (2011). Connectivism: Learning theory and pedagogical practice for netorkd information landscapes, *Reference Service Review,* Vol. 39, No. 4, pp. 675-685.

28. Ajzen, I., Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.

29. Hofstede Geert (2001): *Culture's consequences: comparing values, behaviours, institutions, and organisations* - 2nd Ed. - Thousand Oaks, Calif.; London: Sage Publications.

30. Davis, F.D., Bagozzi, R.P. Warshaw, P.R. (1989). User acceptance of computer Technology: a comparison of two theoretical models. *Management Science*, 35(8), 982–1003.

31. Mathieson, K., Peacock, E. Chin, W.W. (2001). Extending the technology acceptance model: the influence of perceived user resources. *ACM SIGMIS Database* 32(3), 86-112.

32. Venkatesh, V. Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186–204.

33. Amichai-Hamburger, Y., Vinitzky, G. (2010). Social network use and personality, *Computers in Human Behavior Online Interactivity: Role of Technology in Behavior Change* (26:6), pp. 1289–1295.

34. Katona, Z., Zubcsek, P.P., Sarvary, M. (2011). Network effects and personal influences: The diffusion of an online social network, *Journal of Marketing Research*, Vol 48, Iss. 3, pp. 425–443.

35. Kim, Y., Sohn, D., Choi, S. M. (2011). Cultural difference in motivations for using social network sites: A comparative study of American and Korean college students, *Computers in Human Behavior*, Vol. 27, Iss. 1, pp. 365–372.

36. Kwon, O., Wen, Y. (2010). An empirical study of the factors affecting social network service use, *Computers in Human Behavior* Vol. 26, Iss. 2, pp. 254–263.

37. Shin, D.-H. (2010). The effects of trust, security and privacy in social networking: A security-based approach to understand the pattern of adoption, *Interacting with Computers Modelling user experience - An agenda for research and practice*, Vol 22, Iss. 5, pp. 428–438.

38. Georgiadou, E., Hassan N.A., Siakas K.V., Wang X., Ross M., Anandan, P.A. (2007). The Knowledge Society: Gender and Cultural Issues, in E. Berki, J, Nummenmaa, I Sundly, M. Ross, G. Staples (eds). Improving Quality in Computing Education, Proceedings of the *12th INternational*

Conference on Software Process Improvement - Research into Education and Training, (INSPIRE 2007), April, Stafford, UK, The British Computer Society, pp.167 – 176.

39. Zhang, J., Wu, X., Bagchi, K., Udo, G. (2012). What drives social network sites penetration and adoption? A cross country analysis, Social network adoption cross country analysis, DECISION SCIENCES INSTITUTE

40. Blaye, A., Light, P. (1995, January). Collaborative problem solving with HyperCard: the influence of peer interaction on planning and information handling strategies. In *Computer supported collaborative learning* (pp. 3-22). Springer Berlin Heidelberg

41. Statistics Finland. (2010). *Social media: Survey on the use of interactive media and social networking services (Sosiaalinen media: verkkomedian ja yhteisöpalvelujen käyttö)*. Retrieved from http://www.stat.fi/til/sutivi/2010/sutivi_2010_2010-10-26_kat_003_fi.html, April 30.

42. Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. Journal of Interactive Media in Education, Available from http://www.jime.open.ac.uk/jime/article/viewArticle/2 012-18/html. Accessed on 1 March 2016.

43. Hatzipanagos, S. (2015). What do MOOCs contribute to the debate on learning design of online courses? In Depth, eLearning Papers, ISSN: 1887-1542, www.openeducationeuropa.eu/en/elearning_paper sn.º 42 • June.