



Social Media Usage in Higher Education Learning

An Exploratory Approach with Data from China, Poland and Spain

Bartosik-Purgat, Malgorzata

Poznan University of Economics and Business

Economics/ Faculty

m.purgat@ue.poznan.pl

Filimon, Nela

Universitat de Girona

Economia/ Facultat de Ciències Econòmiques i Empresarials

Carrer de la Universitat de Girona/ 10/ 17071/ Girona/ Spain

nela.filimon@udg.edu

1. **ABSTRACT:** We identify behavioral patterns of SM usage for educational purposes of students from Poland, Spain and China. The LC model suggests three clusters: a group of heavy SM users (70.72%), one of users connected to SM all the time (25.18%), and a group of occasional users (4.10%). Cultural differences (nationality), demographic variables and the educational motives for SM usage complete the profile of the clusters with women, on average, more intensive users of SM for education purposes than men.
2. **ABSTRACT:** Este trabajo identifica patrones de uso de los medios sociales (MS) con fines educativos. Datos de China, Polonia y España son analizados con modelos de clases latentes que permiten identificar tres perfiles: uno de usuarios intensivos de los MS (70.72%), un grupo de usuarios que se conectan todo el tiempo (25.18%) y uno de usuarios ocasionales (4.10%). Las variables culturales (nacionalidad) y demográficos, junto con la frecuencia de uso de los MS, completan los perfiles de los segmentos.
3. **KEYWORDS:** medios sociales; educación superior; patrones culturales; aprendizaje; análisis exploratorio; comparación internacional

KEYWORDS: social media; higher education; cultural patterns; learning; exploratory analysis; international comparisson

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Introduction

Most of the researches focusing on the origins of the Internet phenomenon go back to the beginnings of the 60s signaling J.C.R. Licklider as one of the pioneers, with the concept of “Galactic Networking” Internet Society. “A Brief History of the Internet”. Available online: <http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet> (see also Licklider, 1960). In the same fashion, the first social networking activity was dated in 1971, with two computers connected for the first time through an e-mail, and the first social networking site was “Geocities”, created in 1994 1st Web Designer (April, 2016). “History of Social Networking: How it All Began!” Available online: <http://1stwebdesigner.com/history-of-social-networking/>. Since then, digital technologies have registered a very rapid growth path with a multiple impact on various facets of individuals' and society's evolution and development, education being one of them.

The increasing usage of Social Media (SM) by both teachers and students has attracted substantial attention from the researchers in the field, with the purpose of assessing, for example, their role in higher education (see, i.e., Tess 2013, for comprehensive overview of the literature), though with no clear-cut results. Thus, some authors are advocating in favor of a greater use of SM in the classrooms because of their capacity to enhance creativity and diversify teaching styles as a -tool to foster active learning for students (Anderson 2007; Selwyn 2010, etc.), pedagogical choice for teachers (McLoughlin and Lee 2010), leaver of promoting learning in an dynamic and networked social environment (Hung and Yuen, 2010), or as a tool to enhance students' interest, engagement, control and responsibility with their education (Blankenship 2010:12). Other studies, are inviting instead to a cautious adoption and usage of SM for educational purposes, stressing the necessity of some a-priory literacy in SM: attention, participation, collaboration, network awareness and critical consumption, are, according to a US survey carried out among 1,000 college and university faculty members, the five main flaws that need to be taken into account in order to ensure an effective and well-informed usage of SM (see Blankenship 2010:12 for a detailed discussion).

All in all, there are not many comparative studies on the impact of SM on individuals' behaviour, in particular, on their learning habits. The aim of this research is to identify patterns of SM usage in the learning process of students from culturally diversified environments such as Poland, Spain and China with data collected in period 2015-2016. The latent class model suggests three behavioural clusters of SM users: one large group of heavy SM users (70.72%), the online SM users (25.18%), and the occasional SM users (4.10%). Socio-demographic correlates show that cultural differences and gender gaps are still present in the use of SM for educational purposes.

The article unfolds as follows: in section two we present the theoretical framework, section three is dedicated to the methodology and data analysis, in section four we discuss the results and in section five some conclusions are provided.



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Theoretical framework: social media, cultural context and education

Research evidence (see i.e., Munusamy et. al. 2009; Craig & Douglas 2006) has shown that while cultural differences are gaining importance in a globalized world, the massive access to worldwide media and information sources is generating convergence phenomena emerging from the adoption of common cultural patterns. Thus, people coming from different cultures but with access to the same information and communication technologies (ICTs) and marketing communication tools would end up exhibiting similar patterns of behavior (Jiang & Wei 2012). Ruane and Wallace (2013) found that being an active user of SM and social networking websites had a significant influence on people's lives and their decisions. The capacity of the SM to enable the communication among people across the world (Williams et al., 2012), is proven by the continuous increase of the Internet's penetration rate: 2015 data from the www.internetworldstats.com show a level of 67.5% in Poland, 76.9% in Spain and 49.5% in China.

As a matter of fact, some social networking sites in particular, like Facebook and MySpace, for example, have attracted researchers' interest due to their impact also in the classroom with a special focus on the use/abuse is being made both by students and teachers and inviting both sides to a higher degree of integrity protection in the SM (Maranto & Barton, 2010). According to some authors, the broad penetration of the SM in the academic environment allows identifying several communication patterns generated by their use (Davis, et al. 2012): schools using students' blogs as advertising for prospective students (see i.e., Violino 2009); or the use of SM to enable live communication on academic events, alerts, etc. Overall, as stated by the authors, SM seem to have a positive impact on the academia, increasing the engagement of both students and teachers with the academic community. Gikas and Grant (2013) focused on the use of the SM and mobile devices in higher education and their results have shown that they contributed to increase interaction and communication among students who could also engage in online content creation.

Concerning the relationship between cultural differences and SM usage, Xu and Mokarski (2014) compared the SM participation of domestic American and international Chinese students and found significant differences based on the cultural values of the country of origin: while international students were more prone towards using SM for knowledge acquisition, overall, SM were little used by students for academic information searching or for communicating with classmates; Chinese students exhibited also a more individualistic behavior compared to their American counterparts. In a paper by Uzuner (2009), the author performs an overview of the cultural issues and their impact on distance learning stating that the research evidence reviewed has shown that both cultural diversity and common threads coexist in the online learning environment and they must be acknowledged by the online instructors.



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With this research we would like to contribute to the literature on cultural differences, and SM usage for educational purposes, providing recent evidence on the SM usage behavioral patterns of international students from China, Poland and Spain.

Methodology

Data and variables

The data were collected through a paper questionnaire with a similar design structure for all the countries analyzed, except for the language (Malhotra et al. 1996; Craig & Douglas 2006) and filled out by the respondents themselves (Craig & Douglas 2001). The respondents were selected based on a non-probabilistic sampling method, i.e., purposive sampling. Due to the sampling method applied, some limitations apply as the results should not be fully generalized for the whole population of the researched countries and SM users.

The dataset, collected in period 2015-2016, includes 295 respondents from China, 295 from Poland and 129 from Spain, of 15 years and older. Basic socio-demographic statistics are given in Table 1. Other variables included in the analysis refer to: a) the frequency of SM usage along the day -several hours, all the time, not every day (see Table 3, the sample column); b) the main devices (PC/laptop, phone/smartphone, tablet/iPad) used to access SM and their frequency of use with two levels -Yes, at least several times per week; No, less/never (see Table 3, sample column). The motives for using SM for educational purposes included five items, each with three levels of frequency of use -often, rarely, never: M1) I look for information and materials for my education; M2) I send/received educational materials to/from my colleges; M3) I send/received educational materials to/from my teacher; M4) I communicate with teachers if changes of plans or lecture's schedule; and M5) I make new international acquaintances, and I practice the language I am learning (see Table 5, sample column). A battery of items collected information about the frequency of using specific SM for education purposes: Youtube, Youku, Wikipedia and blogs, each one organized in three levels -often, rarely, never - in order to reduce the sparseness of the data (see Table 6, sample column). Thus, Eastern European markets, like Poland, are compared with emerging market economies like China, and developed market economies like the Spanish one (Craig & Douglas 2001).

[Table 1 about here]

Data analysis and model selection



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The data are analyzed with latent class (LC) models (Lazarsfeld and Henry 1968; Goodman 1974) to determine patterns of SM usage for educational purposes with respect to users' frequency of SM usage. Intuitively, the LC analysis splits the sample in T clusters, calculates the probability of each subject being of either one type or another and assigns it to a cluster depending on its belonging probability. In the LC models each observation can be assigned to only one cluster (Magidson & Vermunt, 2001). In the equation below (see Figure 1), X is a discrete latent variable, $t=1, 2, \dots, T$ latent classes, is the vector of responses of subject i on item $k=1, \dots, K$, is the vector of active covariates, and $i=3$, corresponding to the three response items, one for each frequency of SM usage. The devices used to access the SM and their frequency of use act as active covariates (Vermunt 2010:7).

[Figure 1 about here]

The LC analysis estimates first the null model ($T=1$), with one latent class, and under the assumption that the null hypothesis is rejected (the null model is not a good fit for the data) the process continues by incrementing each time the number of latent classes by 1 in order to find the model which is an adequate fit for the data. The analysis was performed with LatentGold 4.5 (Vermunt & Magidson 2008). The statistics given in Table 2 suggest that the model with three clusters would be a better fit for the data as the lower their values, the better (see Raftery 1986). An alternative selection criterion is the p-value (>0.05), according to which the models with 3 and 4 clusters would be a good fit for the data. We choose the model with 3 clusters for its higher parsimony (lower number of parameters).

[Table 2 about here]

Main Findings and discussion

The probabilistic patterns of SM users' behaviour

In Table 3 are presented the estimates of the parameters for the 3-cluster model. The first row stands for the cluster's relative size, and the following rows indicate the probability of SM users' behavior given their classification in that cluster (values in percentages). The results are presented as row profiles, thus allowing for a more intuitive interpretation of the clusters' profiles depending on whether individuals classified in a cluster t are over or underrepresented among individuals with that behavior. In this case, cluster one (70.72%) is overrepresented (see values in black) among individuals using SM at least several hours (heavy users) per day and who do it mainly from PC/laptops or phone/smartphone; cluster 2 (25.18%) is overrepresented among individuals connected to SM all the time (online SM users), mainly from smartphone and tablets/iPads, devices used very often; cluster 3 (4.10%) is integrated by individuals who do not use SM and SNs on a daily basis (occasional SM users).



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[Table 3 about here]

Socioeconomic profile of SM users

The results presented in Table 4 show profiles that individuals in cluster 1 (heavy users) are, on average, overrepresented among women, either single or in couple, most likely with no children, Polish and Spanish, below 20 years of age, and undergraduates (bachelors). Cluster two (online SM) are, overrepresented also among women, either single or with partner but with children, and above 21 years of age. They are more likely to be Chinese, most of them enrolled either in a master degree or being already post-graduated and professionally active. For this segment of SM users, pupils appear also to be online in the social networking sites all the time, most likely because the individuals with this profile are having children. Cluster 3 (occasional SM users) are, on average, overrepresented among Spanish and Chinese, men above 21 years of age, in couple and with children, already post-graduated or professionally active. The socio-demographic covariates indicate that SM users' profiles do exhibit cultural and gender differences, with the young women more active on SM than men.

[Table 4 about here]

Motives for using SM for educational purposes

The variables related to the motives behind the usage of SM for educational purposes only have returned the following profiles for the SM users (see Table 5). Individuals in cluster 1 (heavy users), use the SM and the SNs mainly for exchanging class materials with their colleagues and to make new acquaintances and learn new languages; they use the SM to search educational information only rarely. Cluster 2 (online SM) are the ones who mostly use SM for educational purposes: exchange class materials with colleagues, look for updates related to their classes and also look forward to socialize with new people and practice new languages. The third cluster (occasional), as expected, never use SM or SNs for educational purposes, except for exchanging materials with their colleagues, very rarely or never. The results confirm the existing evidence (see i.e., Xu and Mokarski 2014) showing that Chinese students (women) are more keen to search and use the SM for school purposes while the European students (Polish and Spanish) are more found of socialization through SM, exchanging mainly educational materials with their classmates.

[Table 5 about here]

Patterns of specific SM usage for educational purposes



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Concerning the use of specific SM, like Youtube, Youku, Wikipedia and blogs, for education, the findings confirm the cultural differences observed before between European and Asian students (see Table 6): while the SM users in cluster one (heavy users), on average, Spanish and Polish women, use mainly Wikipedia, for informational purposes only, the Chinese students (women, cluster 2, online SM users) use basically all the mentioned SM sites for educational issues. Cluster 3 (occasional users), mainly men, as expected, do not use any of these SM for education.

[Table 6 about here]

Conclusions

Our findings show that we could identify three behavioural profiles of SM users, according to the frequency of SM access and the devices used for this purpose: the heavy users, spending several hours per day online, the users who are connected to SM all the time, and the occasional users. The socio-demographic covariates complete the profile of the clusters stressing the importance of the cultural differences across European and Asian SM users: while Polish and Spanish women (below 20 years) are heavy users of SM, Chinese women (above 21 years) are connected to SM all the time, using them very often for educational issues. The same result applies also to the usage of specific SM -Youtube, Youku, Wikipedia and blogs -, the Chinese students (women, on average) using basically all the above mentioned SNs for education purposes. The Polish and Spanish graduated students, most likely men (above 21 years), with partner and children are accessing SM not very often whatever the device used for. Thus, SM seem to be important in defining SM users' learning habits, and further analysis is needed in order to identify other potential explanatory factors for the differences observed in the SM users' online behavior.

4.1. FIGURE OR TABLE 1

Figure 1

$$P(Y_i|Z_i) = \sum_{t=1}^T P(X=t|Z_i) \prod_{s=1}^S P(Y_{is}|X=t)$$

Table 1. Basic demographics (%)

	China	Poland	Spain
Gender			
Women	68.6	72.2	50.4
Men	31.4	27.8	49.6
Age			
15 – 20 years	14.3	35.2	44.9
21 – 30 years	66.7	64.1	55.1
>= 31 years	19.0	0.7	0.0
Personal Status			
Single-no children	74.6	54.0	69.8
Single-with children	1.0	0.7	1.6
Couple-no children	6.6	42.6	27.9
Couple-with children	17.8	2.7	0.7
Professional Status			
Pupil	17.6	4.5	.8
Bachelor degree	27.9	78.8	96.8
Master degree	42.4	16.4	2.4
Postgraduate – professionally active	12.1	0.3	n.d.

Source: own data, n.d. – no data

4.2. FIGURE OR TABLE 2



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Table 2: Goodness of fit statistics for the LC model

	Npar	L ²	BIC(L ²)	AIC(LL)	df	p-value	Class. Error
1-Cluster	3	101.792	-198.359	2031.468	46	4.20E-06	0
2-Clusters	10	70.0004	-184.476	2013.677	39	0.0017	0.0157
3-Clusters	17	39.7803	-169.021	1997.457	32	0.16	0.1867
4-Clusters	24	24.1125	-139.013	1995.789	25	0.51	0.2184

4.3. FIGURE OR TABLE 3

Table 3: Probabilistic patterns of SM users' behavior (row profiles in %)

	Cluster 1	Cluster 2	Cluster 3	Sample (%)
Cluster Size	70.72	25.18	4.10	100
<i>Indicators</i>				
Connected to SM and SNs all the time				
Yes	42.53	54.38	3.09	27.7
No	57.47	45.62	96.91	72.3
Connected to SM and SNs several hours				
Yes	94.37	4.08	1.55	21.4
No	5.63	95.92	98.45	78.6
Not connected to SM and SNs every day				
Yes	69.01	1.79	29.2	12.2
No	30.99	98.21	70.75	87.8
<i>Active covariates</i>				
PC/laptop				
Yes, very often	74.17	23.8	2.03	94.6
No	25.83	76.2	97.97	5.4
Phone/smartphone				
Yes, very often	72.02	25.67	2.31	38.6
No	27.98	74.33	97.69	61.4
Tablet/ipad				
Yes, very often	58.19	39.93	1.89	37.7
No	41.81	60.07	98.11	62.3

4.4. FIGURE OR TABLE 4

Table 4: Socioeconomic covariates (row profiles in %)

	Cluster 1	Cluster 2	Cluster 3
Cluster Size	70.72	25.18	4.10
<i>Indicators</i>			
<i>Gender</i>			
Female	71.08	25.6	3.33
Male	28.92	74.4	96.67
<i>Personal Status</i>			
Single no children	71.23	24.83	3.94
Single with children	73.18	25.37	1.45
Couple no children	73.81	22.32	3.87
Couple with children	61.25	31.57	7.18
<i>Age</i>			
15-20 years	76.27	21.76	1.97
21-30 years	69.98	25.36	4.66
>=31 years	58.76	33.47	7.77
<i>Nationality</i>			
Polish	78.49	18.36	3.15
Spanish	72.15	22.77	5.09
Chinesse	61.97	33.41	4.62
<i>Educational status</i>			
Pupil	66.25	31.14	2.61
Bachelor	72.88	23.11	4.01
Master	70.23	26.83	2.94
Post grad-prof. active	56.81	31.53	11.66

4.5. FIGURE OR TABLE 5



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Table 5: Patterns of motives of SM usage for education (row profiles in %)

	Cluster 1	Cluster 2	Cluster 3	Sample (%)
Cluster Size	70.72	25.18	4.10	100
<i>Indicators</i>				
<i>M1) I look for information and materials for my education</i>				
often	70.62	27.5	1.88	39.8
rarely	72.96	24.31	2.73	39.8
never	67.26	22.56	10.18	20.4
<i>M2) I send/received educational materials to/from my colleges</i>				
often	71.87	26.4	1.73	64.5
rarely	69.81	25.74	4.44	27.3
never	64.21	14.65	21.14	8.2
<i>M3) I send/received educational materials to/from my teacher</i>				
often	69.72	28.85	1.43	33.5
rarely	70.17	26.46	3.37	38.4
never	73.08	18.69	8.23	28.1
<i>M4) I communicate with teachers if changes of plans or lecture's schedule</i>				
often	67.64	30.82	1.54	22.8
rarely	70.53	26.6	2.87	41.7
never	73.15	20.3	6.55	35.5
<i>M5) I make new international acquaintances, practice the language I am learning</i>				
often	71.81	25.95	2.24	12.7
rarely	70.61	26.34	3.04	33.4
never	70.82	24.03	5.15	53.8

4.6. FIGURE OR TABLE 6

Table 6: Patterns of specific SM usage for education (row profiles in %)

	Cluster 1	Cluster 2	Cluster 3	Sample (100%)
Cluster Size	70.72	25.18	4.10	100
<i>Indicators</i>				
<i>Youtube: I look for information necessary for my education</i>				
often	70.53	27.12	2.36	24.5
rarely	73.77	23.61	2.62	37.8
never	73.34	20.48	6.18	37.7
<i>Youtu: I look for information necessary for my education</i>				
often	65.26	29.41	5.33	10.4
rarely	61.77	34.64	3.59	30.9
never	73.36	21.8	4.84	58.7
<i>Wikipedia: I look for information necessary for my education</i>				
often	73.07	23.49	3.43	70.0
rarely	71.06	25.85	3.09	23.7
never	68.12	23.42	8.46	6.3
<i>Wikipedia: I look for academic information (to prepare homeworks, exams, etc.)</i>				
often	69.15	27.82	3.03	36.2
rarely	71.92	23.52	4.56	29.9
never	76.34	20.45	3.21	34.0
<i>Blogs: I look for information necessary for my education</i>				
often	68.04	30.4	1.56	13.6
rarely	69.86	26.57	3.57	41.0
never	70.38	25.04	4.58	45.4

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