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SOCIAL INFLUENCE AND DEPENDENCE IN THE FACEBOOK USE BY ROMANIAN AND LITHUANIAN UNIVERSITY STUDENTS

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Abstract

The time spent on Facebook by university students is continuously increasing. This fact is raising many questions as regards the relation between the social networking websites and the university. The educators are challenged to understand the factors that are driving the adoption of social networking websites, the characteristics of the daily use as well as the positive and negative effects on the university work. The social influence has been recognized as one of the factors that are driving the adoption of information systems. On another hand, the excessive use may lead to addiction. The first objective of this research is to explore the correlation between the social influence and the Facebook dependence. A model with these latent variables has been specified and tested on two samples of university students, the first from Romania and the second from Lithuania. The second objective of the research is to comparatively discuss the measures in each country. A multi-group confirmatory factor analysis has been carried on to test the configural and metric invariance. The comparison of means shows that university students reporting higher social influence have a higher risk of Facebook dependence. The comparative analysis revealed that for both variables, the mean values are higher for the Romanian sample.
Keywords: *e-learning process, Facebook dependence, invariance analysis, social influence*.

Introduction

The increasing rate of adoption of social networking websites is one of the major phenomena that impacts many areas of human activity, from education and work to socialization and leisure (Ellison et al., 2007; Bosh, 2009; Selwin, 2009; Davis III et al, 2012). A well-known example is Facebook with a considerable penetration rate in the last decade, especially among young people. Recent studies show that university students have large Facebook networks and spend a lot of time on Facebook (Iordache et al, 2015, Gorghiu et al., 2016). In the context of social learning paradigm, the educators have to understand the factors that are driving the

adoption, the characteristics of the daily use as well as its positive and negative effects on the university work (Caplan, 2010; Balog, Pribeanu, Lamanauskas, Slekiene, 2013).

Social influence has been recognized as an important driver of technology acceptance Venkatesh & Davis, 2000; Bagozzi & Lee, 2002; Risselada et al., 29014). The fast adoption rate of Facebook is in part explained by the social influence that occurs in the social networks. Once becoming a Facebook user, the social network expands by adding new Facebook friends and joining various groups of interest. In turn, this brings in new agents of social influence. For example, the change of status from high school student to university student leads to the expansion of the social network and a potential influence of new colleagues.

On another hand, the excessive use may lead to various forms of addiction (Caplan, 2010; Hong & Chiu, 2014; Orosz et al., 2016). Recent work shows that Romanian university students have large Facebook networks and spend too much time daily (Gorghiu et al, 2016) which may lead to dependence.

This is an extended version of a previous work (Lamanauskas et al., 2017) along two research objectives. The first objective is to measure the social influence, the Facebook dependence, and the relationship between these latent variables on two samples of university students. The first sample has been collected in Romania (N=758) and the other in Lithuania (N=297). The relationship between the two variables has been analysed with the comparison of means. The second objective is to comparatively discuss the measures in each country, by carrying on an invariance analysis. In order to do this, a model with two inter-correlated latent variables has been specified and tested. The first variable is the social influence and the second is the Facebook dependence, measured with the withdrawal syndrome.

Related Work

Social influence is an important driver of the technology acceptance. Users adopt a technology or a product because of their own personal beliefs but also because they have been influenced by the opinion of others (Bagozzi & Lee 2002; Dholakia et al, 2004). Social and individual needs are varying from one person to another and represent the main reasons why individuals use the social networking websites. In this respect, the social needs are the consolidation of social relations, collaboration with people in their network, participate in interest groups, and the development of friendships and relationships.

In their study, Bagozzi & Lee (2002) followed the distinction between three broad types of social influence processes that are related to three types of attitude change (Kelman, 1958): compliance, identification, and internalization. The compliance refers to agreeing with others and can be described as the act of responding in a favorable way to explicit or implicit requests made by others. Thus, an individual may agree with the views of others to accept a particular technology if (s)he lacks adequate information on that technology. The identification refers to the process of being influenced by others in the same social group. Through the process of identification, individuals accept a particular technology because they want to establish or maintain a satisfying, self-defining relationship with their social group. The internalization refers to the process of accepting a belief or behavior because it is consistent with one's value system. Individuals accept a particular technology because it is congruent with their system of values.

Risselada et al. (2014) studied the social influence in the context of the adoption of high-technology products. They noticed that social influence is a relevant factor because the decision to adopt a high-involvement product requires extensive information gathering from various sources. Their study considered two network metrics: tie strength and homophily. The homophily is a social network variable reflecting the socio-demographics similarity between the consumers in a network (McPherson et al., 2001). The idea is that the more similar people are, the more they may influence each another. They found that social influence affects adoption through different social influence variables, implying that it may be worth the effort for companies to collect information on their customers' social networks.

However, an intense use of social networking websites can be harmful. Consumer activity in social networks depends on the personality features. As shown by Papacharissi & Rubin (2000), people feeling less satisfied and less valued in face-to-face communication are using the Internet as an alternate space for communication, or to fill time. For example, people lacking communication skills tend to spend more time in social networks, this way compensating the lack of communication in real life. In turn, this may lead to various negative effects.

Several studies showed that an intense use of social networking websites may lead to negative effects upon students' work (Caplan, 2010; Lamanauskas et al, 2013). Dependence on social networks is ascribed to a psychological dependence group, quite often causing rather significant dependence/addiction. Such dependence/addiction is of two kinds. In the first case, it can develop for any pleasure-giving activity, in the other case, seeking to escape the activity causing unpleasant feelings.

The research carried out in India showed that a greater percentage of the population is in danger to get addicted or is already addicted to Facebook (Modi & Gandhi, 2014) A similar research carried out in Malaysia, showed that social interaction, passing time, entertainment, companionship, and communication motives are related to the Facebook addiction (Sofiah et al., 2011).

A more recent research carried out in Taiwan, showed that university students may become high-risk groups for Facebook addictive tendency (Hong & Chiu, 2014). Gorghiu et al. (2016) studied the relationship between the number of Facebook friends and the negative effects of Facebook. In this respect, they considered three groups, according to the number of Facebook friends: less than 250, 250-500, and over 500. A multi-group analysis revealed that the larger the Facebook network is, the higher are the Facebook dependence and the negative effects of Facebook use on the university work of students.

Measures of the Social Influence and Facebook Dependence

Measurement Scale

Several conceptualizations exist that are featuring a diversity of constructs related to the overuse and addiction to social networking websites, such as withdrawal syndrome, salience, tolerance, overuse, negative effects on work, or mood modification (Andreassen et al, 2012; Masur et al, 2014; Orosz et al, 2016). In this study, the Facebook dependence (AWS) was measured with a withdrawal scale consisting of three items adapted from the scale of Masur et al. (2012).

Table 1. Variables.

Item	Statement
SI1	People who influence me think that I should use Facebook
SI2	People who are important to me think that I should use Facebook
SI3	My colleagues think that I should use Facebook
AWS1	If I am off Facebook for a longer period of time I feel nervous
AWS2	When I am not online, I ask myself what happens on Facebook
AWS3	I feel out of touch when I haven't logged onto Facebook for a while

For the social influence (SI), a scale comprising four items has been used that is based on the existing scales in the literature (Venkatesh & Davis, 2000). Students were asked to answer general questions including the size of their Facebook network and time spent daily, then to evaluate the items on a 1-7 points Likert scale. After checking the inter-item correlation on a pilot sample, one item from the social influence scale has been eliminated for collinearity reasons so the final scale has three items. The items are presented in Table 1.

The statistical analysis has been carried on with SPSS for Windows.

Romanian Sample

The first sample has been collected in Romania and includes 796 university students from seven universities. After checking the normality of variables with SPSS for Windows, 38 observations have been eliminated thus resulting in a working sample of 758 (418 male, 340 female) with a mean age of 21.59 years (SD=2.81). The network size has a mean value of 756.01 (SD=816.26). The time spent in minutes/day is on average 78.29 (SD=74.93).

The mean value and standard deviation for the social influence and Facebook dependence are presented in Table 6 (left side). The frequencies have been analyzed by considering three levels: low (1-2), average (3-5) and high (6-7).

The results for the social influence items are presented in Table 2. Overall, the social influence is low to moderate. As it could be observed, the influence of colleagues (item SI3) is stronger than the influence of other people.

Table 2. Social influence - frequencies (N=758).

Level	SI1		SI2		SI3	
	N	%	N	%	N	%
Low	400	52.77	383	50.53	259	34.17
Moderate	304	40.11	317	41.82	364	48.02
High	54	7.12	58	7.65	135	17.81

The results for the Facebook dependence items are presented in Table 3 and show that the Romanian university students report a low to moderate dependence. As it could be observed, most of the students (57.92%-64.38%) are reporting a low Facebook dependence and less than 10% are reporting a high Facebook dependence.

Table 3. Facebook dependence - frequencies (N=758).

Level	AWS1		AWS2		AWS3	
	N	%	N	%	N	%
Low	488	64.38	442	58.31	439	57.92
Moderate	208	27.44	247	32.59	245	32.32
High	62	8.18	69	9.10	74	9.76

Then a comparison of means having the mean Facebook dependence as dependent variable has been carried on in order to better understand the relationship between the two latent variables. For all social influence items, Romanian students reporting a high social influence also report a high Facebook dependence. The relationship is illustrated in Figure 1.

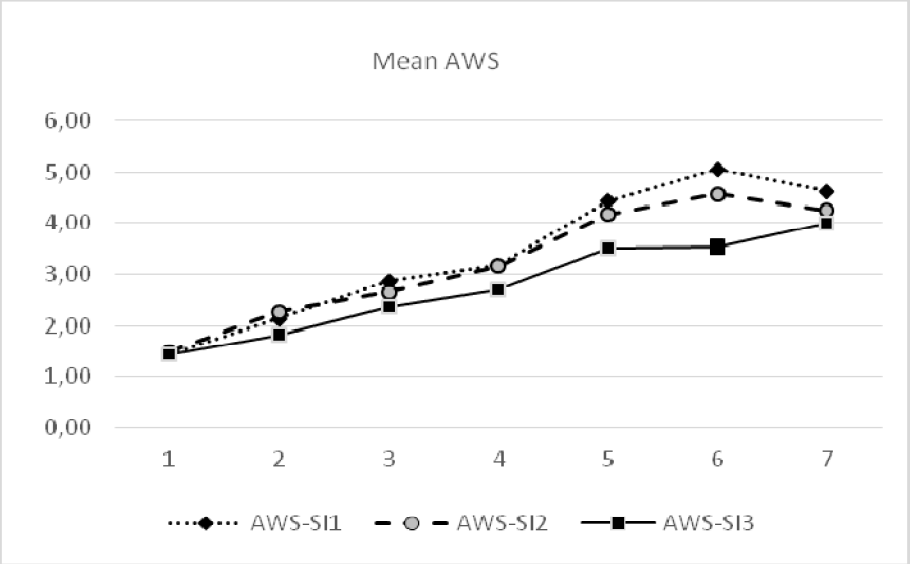


Figure 1: Comparison of means – Romanian sample (N=758).

The Facebook dependence scores (y-axis) are lower in the case a high influence of colleagues. This suggests that the students that are influenced by their colleagues to use Facebook have a lower risk of Facebook dependence.

A one-way ANOVA (6, 751, 757) shows that the differences are statistically significant for all social influence items: SI1 ($F=108.639$, $p=.001$), SI2 ($F=70.163$, $p<.001$), and SI3 ($F=45.018$, $p<0.001$).

Lithuanian Sample

The second sample has been collected in Lithuania in 2016 and includes 297 university students from three universities (118 male, 179 female) with a mean age of 22.33 years (SD=5.34). The network size has a mean value of 267.97 (SD=222.24). The time spent in minutes/day is on average 94.29 (SD=103.81).

The mean value and standard deviation for the social influence and Facebook dependence for the Lithuanian sample are presented in Table 6 (right side). The results for the social influence items are presented in Table 4. Overall, the social influence is low. As it could be observed, the influence of colleagues (item SI3) is much stronger than the influence of other people.

Table 4. Social influence - frequencies (N=297).

Level	SI1		SI2		SI3	
	N	%	N	%	N	%
Low	207	69.70	197	66.33	179	60.27
Moderate	73	24.58	82	27.61	87	29.29
High	17	5.72	18	6.06	31	10.44

The results for the Facebook dependence items are presented in Table 5 and show that most of the Lithuanian university students report a low Facebook dependence (69.36%-77.10%). The number of students reporting a moderate Facebook dependence is almost three times smaller (18.86%-25.59%). Few students are reporting a high Facebook dependence.

Table 5. Facebook dependence - frequencies (N=297).

Level	AWS1		AWS2		AWS3	
	N	%	N	%	N	%
Low	226	76.09	229	77.10	206	69.36
Moderate	56	18.86	61	20.54	76	25.59
High	15	5.05	7	2.36	15	5.05

The comparison shows that Lithuanian students reporting a high social influence also report a high Facebook dependence. The relationship is illustrated in Figure 2.

A one-way ANOVA (6, 290, 296) shows that the differences are statistically significant for all social influence items: SI1 (F=32.334, p<.001), SI2 (F=22.182, p<.001), and SI3 (F=14.306, p<.001).

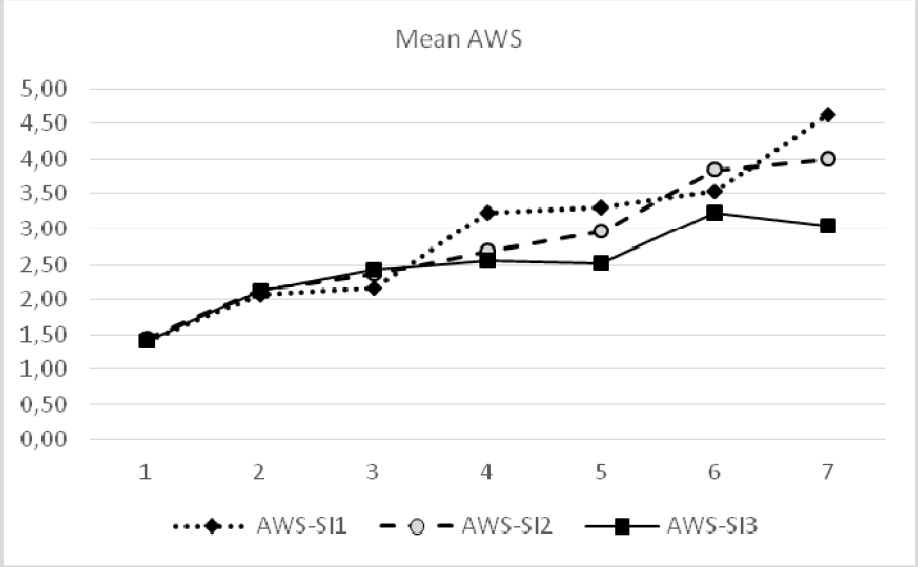


Figure 2: Comparison of means – Lithuanian sample (N=297).

The Facebook dependence scores (y-axis) are higher in the case a high score at SI1 (people who are important for the student).

Comparative Analysis

Model Testing

A model having two inter-correlated latent variables has been tested with AMOS 7.0 for Windows (Arbuckle, 2007), using the maximum likelihood estimation method. The model estimation results are presented in Figure 3.

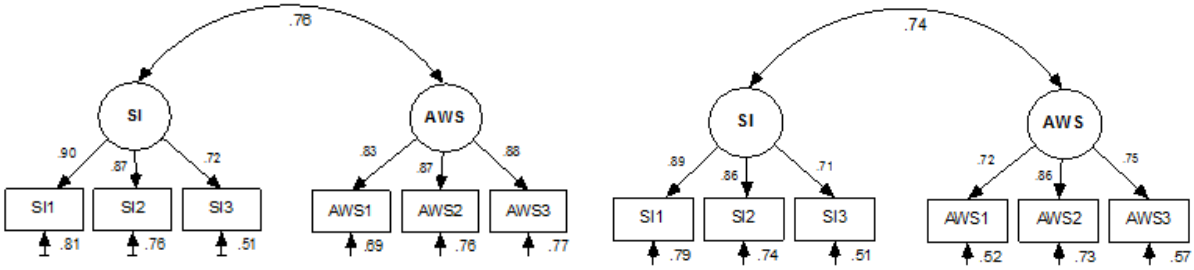


Figure 3. Model testing results: a) Romanian sample (N=758) b) Lithuanian sample (N=297).

Convergent validity has been assessed by examining the loadings (λ) and their statistical significance, the convergent validity (CR - composite reliability and AVE - average variance extracted), and the scale reliability (Hair et al., 2006). The descriptive statistics, estimates (λ), composite reliability, average variance extracted, and reliability (Cronbach's alpha) are presented in Table 6.

As it could be seen for both samples, the composite reliability is over the threshold of 0.7 and the average variance extracted is over the threshold of 0.5. The scale reliability is over 0.8 for both samples.

The results revealed an acceptable fit of the model with the data: χ^2=54.49, df=8, p<.001, χ^2/df=6.81, TLI=0.97, CFI=0.99, SRMR=0.025, RMSEA=0.088, for the Romanian sample, and χ^2=21.53, df=8, p=.006, χ^2/df=2.69, TLI=0.97, CFI=0.99, SRMR=0.036, RMSEA=0.076, for the Lithuanian sample.

Table 6. Descriptive statistics, convergent validity, and reliability.

	RO sample (N=758)						LT sample (N=297)					
Item	M	SD	λ	CR	AVE	Alpha	M	SD	λ	CR	AVE	Alpha
SI1	2.66	1.70	0.90				2.14	1.59	0.89			
SI2	2.76	1.73	0.87				2.24	1.66	0.76			
SI3	3.49	1.90	0.72	0.869	0.691	0.864	2.61	1.93	0.71	0.862	0.678	0.853
AWS1	2.40	1.78	0.78				1.96	1.51	0.72			
AWS2	2.61	1.81	0.84				1.89	1.38	0.86			
AWS3	2.62	1.84	0.49	0.755	0.518	0.898	2.16	1.59	0.75	0.822	0.607	0.816

The correlation coefficient between the two latent variables is high in both countries, showing a strong relationship between the social influence and the Facebook dependence measured with the withdrawal syndrome.

Invariance Analysis

In order to analyze the differences between the two samples, a measurement invariance analysis is needed since the differences could be due to different perceptions or to a different interpretation of the scale (Vandedn berg & Lance, 2000).

A multi-group confirmatory factor analysis (MG-CFA) has been carried on in order to analyze the measurement invariance of the model across the two samples. MG-CFA is testing a hierarchical series of nested models, starting with a baseline (unconstraint) model that fits all the samples taken together (N=1055) and provides a baseline chi-square value. Then, the nested models are obtained by adding constraints on invariance.

A pre-condition is to test the configural invariance by testing and validating the model on each group. These results presented in the previous section showed that the evaluation instrument exhibits configural invariance across the two groups. This means that the groups have a similar perception of the social influence and Facebook dependence since there is the same number of factors and the same number of items measuring each factor.

Then the unconstraint (baseline) model (N=1055) has been tested. The model testing results show an acceptable fit of the model with the data: χ^2=76.022, df=16, p<.001, χ^2/df=4.75,

TLI=0.97, CFI=0.99, SRMR=0.036, RMSEA=0.06. The examination of the model on each group shows that both constructs have the same number of items with loadings over 0.7, thus providing evidence for the configural invariance across groups and enabling further (more in-depth) comparisons.

Table 7. Model comparison (N=1055).

Model	DF	χ^2	CFI	Δ df	Δ χ^2	Δ CFI	p
Unconstraint	16	76.021	0.985				
Measurement weights	20	77.242	0.985	4	1.221	0	.875
Measurement intercepts	26	146.081	0.97	6	68.839	-0.015	.001

The next step is to test the metric invariance between the two samples by constraining the factor loadings of like items to be invariant (Masur, Reinecke, Ziegle, Quiring, 2014). The results show that the evaluation instrument exhibits metric invariance ($\Delta df=4$, $\Delta\chi^2=1.221$, $p=.875$). The implication is that the observed mean scores could be compared across groups.

The test for scalar invariance between groups requires constraining the item intercepts of like items (Masur, Reinecke, Ziegle, Quiring, 2014). The results showed a lack of scalar invariance ($\Delta df=6$, $\Delta\chi^2=68.839$, $p<.001$). The model comparison results are presented in Table 7.

The results show that the model has configural and metric invariance, which enables a comparison between groups based on the observed scores.

Discussion

For both samples, Facebook dependence is relatively small. The measures of the withdrawal syndrome have higher mean values for the Romanian sample. Surprisingly, the mean time spent daily on Facebook is higher for the Lithuanian students.

The magnitude of social influence measures is small to moderate for the Romanian students and small for the Lithuanian students. In both cases, the influence of colleagues is stronger than the influence of other people. However, the difference between the two groups is higher for the latter measure. The differences could be explained in part by the differences between the number of Facebook friends, which is more than twice larger for the first sample. There is various social group impact on Facebook usage in both cases. The existing certain group norms influence the use of Facebook (Cheung, Pui-Yee Chiu, Lee, 2011). Massive culture generally getting stronger connects people into net. In a contemporary society, it feels like a must to have "Facebook" page for the people, especially for the young ones, as a proof of a full-fledged member of society ("if you are not on Facebook, it's possible you don't actually exist").

In both countries, the comparison of means shows that university students reporting higher social influence also reported a higher Facebook dependence. The comparison of each social influence item suggests that the students that are influenced more by their colleagues than by other people have a lower risk of Facebook dependence.

Dependence phenomenon is not unequivocal and it is possibly determined by many factors. One of the obvious factors is information abundance. Entering basically any search term into Google (e.g., searching information), suggestions will be received, and Facebook will definitely be among them. In this case one cannot forget, that university students are teaching service receivers, assessors, who are open to new innovative technologies and willingly accept new study forms and methods. Information search, though not necessarily, but very often is related to the study process as well. An impression is formed, that physically one cannot escape Facebook influence.

On the other hand, the treatment of dependence on Facebook cannot be unequivocal, focussing one's attention only on a negative context. Using Facebook covers plenty of other

various activities, for example, relationship development and communication, discussions, games, news reading, information search for events and public events and so on. Finally, due to different functions of Facebook, there can be different types of dependence at the same time, for example, dependence on correspondence and on games (Griffiths, Kuss, Demetrovics, 2014). In one way or the other possible dependence on Facebook (and other SNW) is distinguished as a separate dependence type. It is obvious, that rapid SNW development (Facebook especially), arouse important communication changes over the latter decade. Researchers analyse other changes as well, such as health problems, relationship problems and other. Speaking about learning youth, especially students, learning and study problems become actual. People, dependent on Facebook on a certain level, spend quite a lot of time using this social network, while the other activities are neglected. Such behaviour might have negative influence on study results and work quality. Research show direct link between worse labour productivity and lower academic evaluation and indifference due to SN site use (Kirschner, Karpinski, 2010), and also reveals relations between dependence on social networks, narcissism and self-esteem (Andreassen, Griffiths, Pallesen, 2017). The research carried out in Lithuania show, that young people personal traits are related to their behaviour in social networks (Pociūtės, Krancaitės, 2012).

Going back to research results Table 6 one can see, that Romanian students have higher perceptions as regards both the social influence on using Facebook and the Facebook dependence. A one-way ANOVA (1, 1053, 1054) showed that the differences are statistically significant for all variables: SI1 ($F=18.874$, $p<.001$), SI2 ($F=20.759$, $p<.001$), SI3 ($F=31.279$, $p<.001$), AWS1 ($F=13.073$, $p<.001$), AWS2 ($F=38.534$, $p<.001$), and AWS3 ($F=14.012$, $p<.001$).

The largest differences are observed between the scores of the item SI3, pointing to the influence of colleagues, and between the scores of AWS2, pointing to the need to be online on Facebook.

There are inherent limitations of this work. The main limitation is the number of observations which is relatively small for the Lithuanian sample. Generally speaking, both samples are not quite big, to adequately represent the millions of Facebook users. On the other hand, a comparative analysis was carried out on the basis of only two samplings in different countries. The respondents' sex variable was not evaluated, because it is believed, that differences exist on the basis of sex. It is worth to expand the research including a wider student contingent from other countries. In this research, due to its size and purpose specificity, dependence prevention questions remain not analysed, which become very actual. Though various cyber dangers, which the youth face communicating in social networks and especially using Facebook, have been analysed for a long time already (e.g., Shaw, Black, 2008), however, it is important to understand, that insufficient theoretical and practical problem cognition can have importance to students' behaviour change, their psychological and emotional condition in future. In this respect, the carried out research is undoubtedly useful, in spite of certain limitations.

Conclusions

The results of this work provide useful insights into the relationship between the social influence and the Facebook dependence measured with the withdrawal syndrome. The two variables are intercorrelated and the invariance analysis shows configural and metric invariance, which enabled a cross-country comparison.

It has been stated, that university student Facebook dependence is relatively small. Also, one can assert, that university students reporting higher social influence also reported a higher Facebook dependence. It is also obvious, that the influence of colleagues is much stronger than the influence of other people.

Despite the fact, that respondents spend a lot of time on FB, they state, that they are not dependent on using social networks, and that this does not have negative influence neither on their psyche, nor on their studies. On the other hand, certain social influence and dependence in the Facebook use differences are fixed between both country students, which demonstrate the necessity of more exhaustive comparative research.

Competing Interests

The first and third authors are the members of the Editorial Board of Problems of Education in the 21st Century, but has neither edited, nor reviewed this article. The second author has declared that no competing interests exist.

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