

## Impact of cognitive styles on the frequency of use of social media amongst university students

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ISSN: 2243-7738  
Online ISSN: 2243-7746

OPEN ACCESS

Received: 14 July 2017

Revised: 21 July 2017

Accepted: 13 August 2017

Available Online: 16 August 2017

DOI: 10.5861/ijrset.2017.1873

### *Abstract*

This study was carried out to examine the impact of undergraduates' cognitive styles on the frequency of use of social media. There are research studies/reports on impact of social media on teaching and learning but a few that look at the relationship between cognitive style and social media. A sample of 900 students were selected through convenience sampling procedure from six universities. From each selected universities, 150 students were selected through convenience sampling. The research instruments used for this study were the adopted cognitive style inventory of Group Embedded Figures Test (GEFT) and self-constructed questionnaire. Group Embedded Figure Test (GEFT) was used to determine the students Cognitive styles and the Questionnaire to determine frequency of use of the social media. Results indicate that there were more Field Independents students than the Field Dependent. It also showed that most of the social media were frequently used while other were occasionally, sparingly and rarely used. The result further showed a significant relationship between cognitive styles and the frequency of use of social media, particularly Facebook and Whatsapp. It was concluded that cognitive styles had an influence on undergraduate's frequency of use of some social media.

**Keywords:** cognitive styles; social media; GEFT; frequency; adoption

## **Impact of cognitive styles on the frequency of use of social media amongst university students**

### **1. Introduction**

Social media is seemingly the most trending communication media because of its features and characteristics that support the process of free, fast and effective communication. These features include text, images, audio/video sharing, fast publishing, linking from all over the world, direct connecting, and so on. While it is also the cheapest, it provides very fast access to reaching any part of the world. The use of social media is increasing by the day. Many individuals, particularly youths, are shifting speedily from the early electronic media of communication such as television and radio, to social media. The craze for the use of social media has led to a host of questions regarding its impact on the society. While it is agreed that social media affects people's living styles, there is an ongoing process to identify the nature of these influence in every society and country, especially on youths (Ghulam, Mahmood, Ghulam, & Muhammad, 2014). The use of social media is enormous. Most importantly, the use of social media is said to be for communication and interaction. Facebook, Twitter, Whatsapp, Blackberry Messenger (BBM), LinkedIn, YouTube and many more, have emerged to enhance communication. Bryant, Sanders-Jackson, and Smallwood (2006) reported the findings related to youths in the use of socially interactive technologies (SITs) and found that they: (i) enhance communication among friends and family, to make plans with one another, and to maintain social contact outside of their day-to-day and face-to-face conversations. (ii) These technologies have been adopted by youths relatively and quickly because text messaging is more convenient, less expensive, and faster than traditional technologies. (iii) Research in this arena has shown that although preference for using SITs to communicate is definitely on the rise, and the use of SITs has surpassed that of email, youth still tend to hold in-depth, important conversations offline.

Cognitive style refers to the preferred way individuals process information. Cognitive style is usually described as a personality dimension which influences attitudes, values, and social interaction. Witkin, Lewis, Hertzman, Machover, Meissner and Wapner (1954) established the concept of field dependent, field Independent and field neutral in their research. The research led the authors to view individual consistencies in the matter of perceiving and thinking as critical psychological phenomena and also shed light on the determining role of needs and values in perception. Literature has established clear cut distinction between the field independent learners and field dependent learners. It has been found that field independent learners perform better in the conventional information processing tasks than their field dependent counterparts (Handal & Herrington, undated). Simonson (1985) affirmed that field dependents learners are more influenced by the social environments rather than by what motivates them. They appear to be more influenced by praise and criticism than field independent learners. In turn, field independents are more proactive and usually have a strong concept. Triantafilou, Pomportsis, Demetriadis and Georgiadou, (2004) describe field independent learners as generally analytical in perception and interpretation, whereas field dependent learners are more global in perception and interpretation. "Among the cognitive styles identified to date, the field-dependence-independence dimension has been the most extensively studied and has had the widest application to educational problems (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962/1974).

Studies have however shown that social media usage among undergraduate students is no longer a new phenomenon in teaching and learning. Researches also abound on the integration and impact of social media on teaching and learning. Most of these studies were tailored towards establishing the relationship between social media and performance, social media and use, factors affecting the choice and use of social media, and social media in enhancing collaboration. However, there is paucity of studies addressing the impact of cognitive styles (preferred way individuals process information) on the choice and pattern of use of social media. This has inadvertently caused misapplication/deployment of social media in teaching. It therefore becomes imperative to

fill this gap, hence this study.

### *1.1 Specific Objectives of Research*

The specific objectives of the study are to:

- determine the cognitive styles of the undergraduates in Southwestern Nigeria;
- assess the influence of undergraduate's cognitive style on the frequency of use of social media.

### *1.2 Hypothesis*

Ho-There is no significant relationship between cognitive styles and undergraduates frequency of use of social media.

### *1.3 Methodology*

The study employed survey research design. The population consisted of all undergraduates in the Southwestern universities in Nigeria. A sample of 900 students was selected through convenience sampling procedure from six universities. Since there are six states in the Southwest, one university was selected by simple randomization from each state. Two research instruments were used for this study; namely; Social Media Choice and Pattern of Use Questionnaire (SMCPUQ) and the Cognitive Style inventory of Group Embedded Figures Test (GEFT). SMCPUQ measured respondent's choice and pattern of use of social media. The other instrument; GEFT designed by Herman A. Witkin (1967) was used to determine student's cognitive style. The research was conducted within five weeks with the help of a research assistant. Data collected were analyzed using appropriate descriptive and inferential statistics.

## **2. Literature Review**

Tiryakioglu and Erzurum (2011) observed that as of February 2011, Facebook has more than 500 millions of users around the world. Fifty percent of total users actively login to the site every day. Users spend a total of 700 billion minutes per month on Facebook. More than 200 million users have mobile connection to Facebook. There are about a billion of locations (pages, groups, activities etc.) in Facebook where users interact with each other. An ordinary user is connected to 80 groups, activities or society pages and shares an average of 90 contents per month. Users share more than 30 billions of contents per month. Social baker (2012) also reported that of these 500 million plus users of Facebook, there are currently 4,312,060 users in Nigeria, which makes it no 37 in the ranking of all Facebook statistics by country. But of all the above mentioned details on Facebook, it is not to say there are no users on the other social networks. Whatsapp for one has also gathered a number of users ranging from over 500million to about 800 million users.

Every individual, one way or the other makes use of one social media or the other (Facebook, Whatsapp, Twitter, Instagram, Messenger, YouTube and the like). The exact reasons for such use are only known to the users. When it comes to the issues of socialization, it involves communication at least up to 80% and relating to individuals cognitive styles (field dependent or field independent) it tends to influence the choice of any individual and how he or she uses it. However, the form of influence could either be positive or negative depending on the person's ability to process information and instruction, and the nature and structure of each social media. Voithofer and Foley (2007) opines that these social media has the capacity to function as 'intellectual partners' and by so doing promotes critical thinking and facilitate cognitive processing. Social media sites have also become a platform for people to do different things. These according to Mazman and Usluel (2010) ranges from allowing rapid updating, analyzing and sharing the continuously increasing information, reflecting on daily life, establishing and maintaining spontaneous social contacts and relationship. It is evident that students tend to follow the trend of technology development and advancement for information

processing, nonetheless, the frequency of use of the social media is believed to have been birthed by each student's abilities to process information which is characterized by the student's ability to do things, think, remember or solve problems. It is therefore clear that this study is out to uncover undergraduate's personal abilities to perceive, interpret and process information through their various choice of social media applications and its pattern of use.

Over the years, all across universities within Nigeria, particularly the southwestern Nigeria, the evolving trend of the social media has eaten deep into the system, both for educational and social purposes. However, it is not clear enough if indeed the usage of social media has an influence on students' cognitive style or if indeed the cognitive styles an individual possess has an impact on the choice and pattern of use of social media. But, whether it is proven or not, the use of a social media requires a sense of cognition that allows for knowledge or information processing. However, this study intends to find out whether there is a significant impact of cognitive styles on the choice and pattern of use of social media, particularly used amongst undergraduate students in South-western universities. The increased use of social media among students has led to universities integrating social media into teaching and learning toolkits (Blankenship, 2010; Bell, 2011; Chen & Bryer, 2012; Moran, Seaman, & Selwyn, 2012). On one hand, some scholars have argued that social media have a negative relationship with academic performance (Jacobsen & Forste, 2011). On the other hand, some others are of the opinion that the social media have the potential to increase a student's learning and 'cognitive ability' within a social framework (Bell, 2011; Chen & Bryer, 2012). Consequently, several Universities have intensely integrated social media, in various forms, into their students' academic life, both in and outside Nigeria. McLoughlin and Lee (2010) suggested that online social networks will give room for learners and instructors to present themselves socially in an online environment and connect with one another while enabling individuals to engage in recurring meaningful experiences with others.

Basically, the impact of students' abilities to receive and process information and instructions on social media frequency of use is what this research intends to look into. Numerous studies have explored the importance of learners' cognitive styles and the role of field dependence and Independence in instruction and learning (Burton, Moore, & Holmes, 1995). Appropriate environmental conditions and cues can be presented when information about learners is accommodated by the flexibility of computerized environments (Kini, 1994). Unlike individual differences in abilities which describe peak performance, styles that describes a person's typical mode of doing things, thinking, remembering or problem solving. Furthermore, styles are usually considered to be bipolar dimensions whereas abilities are unipolar (ranging from zero to a maximum value). Having more ability is usually considered beneficial while having a particular cognitive style simply denotes a tendency to behave in a certain manner.

Field dependent Learners tend to use fewer new terms in their searches, to retrieve a high number of relevant results and to rate their success in searching high. Conversely, field independent learners are much more likely to change their search terms frequently, retrieve a smaller number of relevant results and rate their search success relatively low. The actual effectiveness of both styles of searching was relatively equal, only the strategy of searching differed (Lucas-Stannard & Fall, 2003). The study is intended to relatively figure out the impact of the field dependent and independent learners on the choice and use of social media, which could be for recreational purpose or academic purpose.

It is evident that students tend to follow the trend of technology development and advancement, but the frequency of use of these media are believed to have been birthed by each student's abilities to process information. It is characterized by the student's ability to do things, think, remember or solve problems. The puzzle therefore is to uncover the functionality of each social media to be navigated through by the students via each person's ability to perceive and interpret information. Some of these social media networks are complex to operate or surf through, but the difference between students who do find it easy to operate and students who do not could be the cognitive style which is relatively a strong contributing factor.

Notwithstanding, the adoption of social media by any student does not mean that the student has completely explored the usage of such social network media without any difficulty or thoughts, rather, the interest to choose from the available and accessible social media would have sprung out of some cognitive abilities and features. As stated earlier, this study intends to critically discover the impact of such cognitive abilities; discovering how each student chooses and uses a social network media or a list of them in the process. A clear understanding of this by students themselves is believed to in some ways affect their subsequent choice and pattern of use which would not just leave them in an obscure state of exploration on social media platform.

### 3. Result and Findings

A total of 900 copies of questionnaires and Group Embedded Figure Test (GEFT) were administered on the respondents, 803 copies were recovered but only 767 copies were valid and usable as 36 copies were considered invalid at the level of analysis because it was not completed by the respondents. All analyses were done with the Statistical Package for the Social Sciences (SPSS 17.0).

*Objective 1:* To determine the cognitive styles of the undergraduates in Southwestern Nigeria

**Table 1**

*Cognitive styles possessed by the undergraduates in Southwestern Nigeria*

		Cognitive Style(GEFT)		
		Frequency	Percent	Valid Percent
Valid	Field Dependent (FD)	57	40.4	40.4
	Field Independent (FI)	84	59.6	59.6
	Total	141	100.0	100.0

*Note:* The Instrument used to achieve this question was the Group Embedded Figure Test. This Test includes an 18 figure test which is use to identify each of the respondents Cognitive Styles. Respondent who scored between 0-11 were categorized as Field Dependent (FD) while respondents who scores between 12-18 were categorized as Field Independent (FI).

Table 1 shows that 40.4% of the respondent represents the Field Dependent (FD) while 59.6% of the respondent represents the Field Independent. The simply showed that we have more of Field Independent (FI) respondents than the Field Dependent (FD) respondents.

*Objective 2:* To investigate undergraduates' pattern of use of social media

**Table 2**

*Frequency of use of the respondent's choice of each social medium*

Social Media	Frequently	Occasional	Sparingly	Rarely	Never	Total F	%	Missing F	%
Facebook	424	183	48	52	26	733	95.6	34	4.4
	55.3%	23.9%	6.3%	6.8%	3.4%				
Twitter	87	165	80	111	69	512	66.8	255	33.2
	11.3%	21.5%	10.4%	14.5%	9.0%				
Whatsapp	609	62	16	11	23	721	94.0	46	6.0
	79.4%	8.1%	2.1%	1.4%	3.0%				
LinkedIn	23	58	46	29	100	256	33.4	511	66.6
	3.0%	7.6%	6.0%	3.8%	13.0%				
Instagram	275	181	71	33	38	598	78.0	169	22.0
	35.9%	23.6%	9.3%	4.3%	5.0%				
Skype	30	62	64	43	92	291	37.9	476	62.1
	3.9%	8.1%	8.3%	5.6%	12.0%				

**Table 2** ...continued

Social Media	Frequently	Occasional	Sparingly	Rarely	Never	Total F	%	Missing F	%
Youtube	121 15.8%	168 21.9%	73 9.5%	31 4.0%	28 3.7%	421	54.9	346	45.1
SnapChat	70 9.1%	66 8.6%	40 5.2%	32 4.2%	97 12.6%	305	39.8	462	60.2
Yahoo Messenger	59 7.7%	78 10.2%	52 6.8%	48 6.3%	92 12.0%	329	42.9	438	57.1
BBM	96 12.5%	156 20.3%	81 10.6%	81 10.6%	63 8.2%	478	62.2	290	37.8
Flirkr	15 2.0%	9 1.2%	13 1.7%	7 0.9%	147 19.2%	191	24.9	576	75.1
Imo	62 8.1%	74 9.6%	46 6.0%	76 9.9%	101 13.2%	359	46.8	408	53.2

Table 2 shows how frequently social media were being used by the respondents. From the above table, it shows that 55.3% of the respondents used Facebook frequently, 23.9% occasionally, 6.8% rarely, 6.3% sparingly while 3.4% of the respondents never made use of Facebook. In the case of Twitter, 21.5% of the respondents used Twitter occasionally, 14.5% rarely, 11.3% frequently, 10.4% sparingly made use of it while 9.0% never made use of Twitter. Whatsapp recorded 79.4% respondents who frequently made use it, 8.1% occasionally, 3.0% never to have used Whatsapp before, 2.1% sparingly and 1.4% rarely. LinkedIn had 13.0% of the respondents who never made used it, 7.6% occasionally made use of LinkedIn, 6.0% sparingly, 3.8% rarely, and 3.0% frequently. 35.9% of the respondents used Instagram frequently, 23.6% occasionally, 9.3% sparingly, 5.0% never made use of Instagram and 4.3% rarely did. Skype had 12.0% of the respondents who had never made use of it before, 8.3% sparingly, 8.1% occasionally, 5.6% rarely while 3.9% frequently made use of it. In the case of YouTube, 21.9% occasionally made use of it, 15.8% frequently, 9.5% sparingly, 4.0% rarely while 3.7% never made use of it. SnapChat had 12.6% of the respondents who never made use of it, 9.1% frequently used SnapChat, 8.6% occasionally, 5.2% sparingly, while 4.2% rarely did. Yahoo Messenger also had 12.0% of the respondents who had never made use of it, 10.2% occasionally, 7.7% frequently made use of Yahoo messenger, 6.8% sparingly, while 6.3% rarely.

Table 2 again shows that 20.3% of the respondents used BBM occasionally, 12.5% frequently, 10.6% used BBM both sparingly and rarely, while 8.2% never made use of it. Flirkr had the highest number of non-users with 19.2% while 2.0% used it frequently, 1.7% sparingly, 1.2% occasionally made use of Flirkr and 0.9% rarely. Imo also recorded 13.2% of the respondents who never made use of it, 9.9% rarely, 9.6% occasionally made use of Imo, 8.1% frequently while 6.0% sparingly made use of Imo. It was observed that most of these social media recorded a high number of non-users while others were used frequently and occasionally, and very few used it sparingly and rarely.

**Hypothesis:** There is no significant relationship between cognitive styles and undergraduates pattern of use of social media.

This hypothesis was valued by using Pearson Chi-Square Test to determine if there was no significant relationship between cognitive styles and undergraduate's choice of social media. Table 3 presents the statistical influence of respondents' frequency of use of social media on cognitive styles. It was observed that cognitive styles have a significant influence on Facebook at  $P$  value of 0.000 and chi square value of 22.885 which was significant at  $p \leq 0.05$ . This trend was also observed for LinkedIn having significantly been influenced by cognitive styles at  $P$  value 0.018 and a chi square value of 11.856, which was measured at  $p \leq 0.05$ . BBM also was significant at  $P$  value 0.010 and a chi square value of 3.176, Flickr whose  $P$  value was 0.002 with chi square value of 6.601 were significant at  $p \leq 0.05$ . This could not be said of other types of social media such as Twitter,

Whatsapp, Instagram, Skype, Youtube, SnapChat, Yahoo Messenger and Imo. The table further shows that cognitive does not influence the frequency of use of Twitter whose  $P$  value was 0.069 and chi square value 8.819; Whatsapp with  $P$  value of 0.363 and chi square value 4.328; Instagram with  $P$  value of 0.901 and Chi Square value of 1.056; Skype with  $P$  value 0.425 and Chi square value 3.864; YouTube with  $P$  value 0.052 and chi square value 9.397; SnapChat with  $P$  value 0.077 and chi square value 8.416; Yahoo Messenger with  $P$  value 0.275 and Chi square value 5.118; and Imo with  $P$  value of 0.313 and Chi square value of 4.761 respectively, which was not significant at  $p \leq 0.05$ . The hypothesis that states that there is no significant relationship between cognitive styles and undergraduates pattern of use of social media (frequency of use) is therefore not rejected.

**Table 3**

*Frequency of Use of respondents Social Media in the classification of their cognitive style*

Social Media	FIELD DEPENDENT (FD)					FIELD INDEPENDENT (FI)					Chi Square	P-Value
	Frequently	Occasional	Sparingly	Rarely	Never	Frequently	Occasional	Sparingly	Rarely	Never		
Facebook	151 35.6%	63 34.4%	15 5.5%	26 50.0%	20 76.9%	273 64.4%	120 65.6%	33 68.8%	26 50.0%	6 23.1%	22.885	.000
Twitter	37 42.5%	50 30.3%	33 41.3%	38 34.2%	33 47.8%	50 57.5%	115 69.7%	47 58.8%	73 65.8%	36 52.2%	8.719	.069
Whatsapp	212 34.8%	26 41.9%	7 43.8%	4 36.4%	12 52.2%	397 65.2%	36 58.1%	9 56.3%	7 63.6%	11 47.8%	4.328	.363
LinkedIn	3 13.0%	25 43.1%	20 43.5%	8 27.6%	48 48.0%	20 87.0%	33 56.9%	26 56.5%	21 72.4%	52 52.0%	11.856	.018
Instagram	95 34.5%	66 36.5%	26 36.6%	13 39.4%	16 42.1%	180 65.5%	115 63.5%	45 63.4%	20 60.6%	22 57.9%	1.056	.901
Skype	10 33.3%	21 33.9%	30 46.9%	18 41.9%	31 33.7%	20 66.7%	41 66.1%	34 53.1%	25 58.1%	61 66.3%	3.864	.425
Youtube	44 36.4%	68 40.5%	38 52.1%	11 35.5%	6 21.4%	77 63.6%	100 59.5%	35 47.9%	20 64.5%	22 78.6%	9.397	.052
SnapChat	25 35.7%	16 24.2%	20 50.0%	11 34.4%	40 41.2%	45 64.3%	50 75.8%	20 50.0%	21 65.6%	57 58.8%	8.416	.077
Yahoo Messenger	19 32.2%	24 30.8%	23 44.2%	18 37.5%	41 44.6%	40 67.8%	54 69.2%	29 55.8%	30 62.5%	51 55.4%	5.118	.275
BBM	35 36.5%	57 36.5%	22 27.2%	27 33.3%	35 55.6%	61 63.5%	99 63.5%	59 72.8%	54 66.7%	28 44.4%	3.176	.010
Flirkr	4 26.7%	4 44.4%	11 84.6%	0 0.0%	58 39.5%	11 73.3%	5 55.6%	2 15.4%	7 100.0%	89 60.5%	6.601	.002
Imo	23 37.1%	32 43.2%	15 32.6%	21 27.6%	40 39.6%	39 62.9%	42 56.8%	31 67.4%	55 72.4%	61 60.4%	4.761	.313

#### 4. Discussion and Conclusion

The study examined influence of cognitive style on the frequency of use of social media. The field survey in its objective observed the respondent's cognitive style and the result showed that there were more Field Independent (FI) students than Field Dependent (FD) in the southwestern universities. The above indication was in line with the Triantafillou, Ponportsis, Demetriads, and Georgiadou (2004) findings that revealed that field independent (FI) learners generally are analytical in their approach, whereas field dependent (FD) learners are more global in their perceptions. In other words, the above findings from Triantafillou, Ponportsis, Demetriads, and Georgiadou (2004) further explained that the Field Independent (FI) students tends to create meaning from any situation and then extend and apply their knowledge to novel situations, while the Field dependent (FD)

students usually face some difficulties in separating the part from the complex organization of the whole and this could justify the reason why from the researchers findings we had more students to be field Independent than field dependent due to the nature of the GEFT administered to them.

The researcher also with its study examined how the undergraduates Frequently, Occasionally, Sparingly, Rarely and never made use of the social media used. The results indicated Whatsapp, Facebook and Instagram were frequently used by a good number while YouTube, BBM, Twitter were also occasionally used. This result buttressed Tiryakioglu and Erzurum's (2011) findings justifying that fifty percent of total users actively used to login the site every day. Users spend a total of 700 billion minutes per month on Facebook which justifies its frequent usage. Tiryakioglu and Erzurum's (2011) again concluded that more than 200 million users had mobile connection to Facebook. There were about a billion of locations (pages, groups, activities etc.) in Facebook where users interacted on another. Owing to the fact that the Facebook and Whatsapp platforms are owned and managed by the same company and owner, it therefore would share certain features of usage in common. Rideout, Foehr, and Roberts, (2010) also agreed that research reports found that the youths usually spend nearly 10 hours every day using some forms of technology, with socially networked media playing a large role in their daily lives.

The hypothesis raised also states that the Field Independent students were more in measuring the frequency of use of each Social Media. Facebook, LinkedIn, BBM and Flickr were significant at  $p \leq 0.05$ . Daniel and Christian (2003) supports in its finding that 'Social media' such as Facebook support cognition. That report justifies that of the list of Social media that cognitive style has influence on, Facebook and Whatsapp were common. Therefore, on general note, this study from its report justifies all other reports and findings reviewed in the study.

Based on the findings of the study, the following conclusions were drawn; that there are more undergraduates who are field independent students than field dependent in the southwestern universities; Undergraduates frequently make use of some social medium such as Facebook, Whatsapp, Twitter, Instagram ahead of others that are occasionally, sparingly and rarely used. Cognitive styles have significant relationship with undergraduates' pattern of use of social media even though not all the social media were significant at  $p \leq 0.05$ .

## 5. References

- Bell, F. (2011). Connectivism: Its place in enabled learning. *International Review of Research in Open and Distance Learning*, 12(3), 98–118. <https://doi.org/10.19173/irrodl.v12i3.902>
- Blankenship, M. (2010). How social media can and should impact higher education. Hispanic outlook. Retrieved from <https://www.wdhstore.com/hispanic/data/pdf/no29-howsocial.pdf>
- Boyd, D., & Ellison, N. B. (2008). Social networking sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210-230. <https://doi.org/10.1111/j.1083-6101.2007.00393.x>
- Bryant, J. A., Sanders-Jackson, A., & Smallwood, A. M. K. (2006). IMing, text messaging, and adolescent social networks. *Journal of Computer Mediated Communication*, 11, 577–592. <https://doi.org/10.1111/j.1083-6101.2006.00028.x>
- Burton, J. K., Moore, D. M., & Holmes, G. A. (1995). Hypermedia concepts and research: An overview. *Computers in Human Behavior. Special Issue: Hypermedia: Theory, Research, and Application*, 11(3–4), 345–369. [https://doi.org/10.1016/0747-5632\(95\)80004-R](https://doi.org/10.1016/0747-5632(95)80004-R)
- Chen, B., & Bryer, T. (2012). Investigating instructional strategies for using social media in formal and informal learning. *The International Review of Research in Open and Distance Learning*, 13. <http://dx.doi.org/10.19173/irrodl.v13i1.1027>
- Daniel, T., & Christian, F. (2003). *Theorizing social media, politics and the state: An Introduction*. New York: Routledge.



- Ghulam, S., Yousef Mahmood, Y. M., Ghulam, S., & Syed Muhammad, F. S. G. (2014). Impact of social media on youths. *Asian Journal of Social Sciences & Humanities*, 3(4), 133-134.
- Jacobsen, W. C., & Forste, R. (2011). The wired generation: Academic and social outcomes of electronic media use among university students. *Cyber psychology, Behavior, and Social Networking* 14 (5), 275–280. <https://doi.org/10.1089/cyber.2010.0135>
- Kini, A. S. (1994). Effects of cognitive style and verbal and visual presentation modes on concept learning in CBI. Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Mazman, S. G., & Usluel, Y. K., (2010). Modeling educational usage of Facebook. *Computers & Education*, 55(2).444 -553. <https://doi.org/10.1016/j.compedu.2010.02.008>
- McLoughlin, C., & Lee, M. J. W. (2007). Social software and participatory learning: Pedagogical choices with technology affordances in the Web 2.0 era. Paper presented at the *ASCILITE* (pp. 664-675). Singapore.
- McLoughlin, C., & Lee, M. J. W. (2010). Personalised and self-regulated learning in the Web 2.0 era: International exemplars of innovative pedagogy using social software. *Australasian Journal of Educational Technology*, 26(1), 28-43. <https://doi.org/10.14742/ajet.1100>
- Moran, M., Seaman, J., & Tinti-Kane, H. (2011). *Teaching, learning, and sharing: How today's higher education faculty use social media*. Boston, MA: Pearson Learning Solutions and Babson Survey Research Group.
- Simonson, M. R. (1985) *Persuasion: Five studies dealing with the relationships between media, attitudes, and learning style*. ERIC Document Reproduction Service No. ED 256 337.
- Tiryakioglu, F., & Erzurum, F. (2011). Use of social networks as an education tool. *Contemporary Educational Technology*, 2(2), 135-150.
- Triantafyllou, E., Pomportsis, A., Demetriads S., & Georgiou E., (2004). The value of adaptivity based on cognitive style: an empirical study. *British Journal of Educational Technology*, 35(1), 95-106. <https://doi.org/10.1111/j.1467-8535.2004.00371.x>
- Voithofer, R. J., & Foley, A. (2007). Digital dissonances: Structuring absences in national discourses on equity and educational technologies. *Equity and Excellence in Education*, 40(1), 14-25. <https://doi.org/10.1080/10665680601088515>
- Witkin, H. A., Dyk, R. B., Faterson, H. F., Goodenough, D. R., & Karp, S. A. (1962). *Psychological differentiation: Studies of development*. New York: John Wiley & Sons. <https://doi.org/10.1037/13128-000>
- Witkin, H. A., Lewis, H. B., Hertzman, M., Machover, K., Meissner, P. B., & Wapner, S. (1954). *Personality through perception*. New York: Harper & Collins.

