

Undergraduate Students in Online Social Communities: An Exploratory Investigation of Deliberate Informal Learning Practices

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A total of 573 undergraduate students consented to participate in this investigation about deliberate informal learning practices using social media. Data analysis consisted of parametric and non-parametric statistical procedures. An analysis of the rankings provided by undergraduate students for the different deliberate informal learning activities performed in their most used social media (MUSM) showed that listening to podcasts related to their area of study, following/connecting with professional organizations, and connecting with leaders in their field of study were ranked higher than the other activities. The results also showed evidence of statistically significant differences in the ranking provided to the informal learning activities performed by undergraduate students in their least used social media (LUSM). Listening to podcasts related to their area of study, viewing videos that can assist with coursework, and following/connecting with professional organizations were ranked higher than the other deliberate informal learning activities. The results of this investigation can be of benefit to instructors, regardless of the discipline of study, and instructional designers wishing to connect academic activities with informal learning endeavors that undergraduate students are already performing for personal enjoyment while participating in online social communities.

Introduction

In education and training settings, we often use the term “informal learning” to describe learning experiences that do not follow a specific curriculum and are not restricted to a specific environment (Richter et al., 2011). Other definitions of informal learning refer to education that is never organized, has no set objectives, and is not intentionally undertaken as a learning activity (Werquin, 2007). It is very possible that learners can shift seamlessly between formal and informal learning (Moore, 2016). Additionally, Moore (2016) states that during informal learning, the learners may or may not acknowledge that they are acquiring new information. Eraut (2004) refers to this type of informal learning as implicit learning. Eraut (2004) also distinguishes two other types of informal learning: reactive and deliberate learning. Reactive learning refers to a situation in which the individual is aware that informal learning is occurring; however, it happens spontaneously in a specific context. Deliberate learning refers to informal learning that occurs when an individual takes time to think about how and where to gather information.

According to Rehm and Notten (2016), online social communities provide an adequate environment in which individuals can engage in activities that lead to deliberate informal learning. Today content creation applications, such as social media, facilitate creating and sharing knowledge (Romero-Hall, 2017a). Previous researchers have argued that, through these multi-user connections and support systems, individuals using social media can in turn have access to content and participation in informal learning experiences (Rehm & Notten, 2016; Romero-Hall, 2017a). Although learning is not guaranteed from simply using social media, these social opportunity spaces provide the right set of circumstances to engage with others and foster knowledge creation and learning processes (Romero-Hall, 2017b; Romero-Hall, 2017c).

There have been many investigations related to informal learning occurring in online social communities in various settings, platforms, and populations (Rehm & Notten, 2016; Tucker, 2019; Chen & Bryer, 2012; Fox & Ralston, 2016; Garcia et al., 2015; Russo et al., 2009). However, further investigations are needed to address informal learning by undergraduate students engaged in online social communities. Research has clearly stated that young individuals, including undergraduate students, are avid users of social media (Chen & Bryer, 2012). What remains understudied is the informal learning that occurs via day-to-day interactions with content in online social communities. A better understanding of how undergraduate students partake in informal learning while participating in online social communities can help inform educators wanting to use social media

for education. The aim of this investigation was to further understand which deliberate informal learning activities are more commonly performed by undergraduate students while participating in online social communities for personal purposes.

Literature Review

Social media, and online social communities, are infiltrating the educational arena (Chen & Bryer, 2012; Gao et al., 2012). There are many research efforts focused on the use of social media in formal teaching and learning (Dabbagh & Kitsantas, 2012; Manca & Ranieri, 2016, 2017; Gao et al., 2012). However, the results on whether young individuals favor using social media in their formal learning experiences is mixed (Greenhow & Lewin, 2016; Garcia et al., 2015). In addition, researchers have warned against the use of social media in formal learning settings due to potential negative effects and risks associated with addiction and distractions (Lau, 2017; Terry et al., 2016; Wu, 2017), social isolation (Shensa et al., 2016; Whaite et al., 2018), online harassment (Gosse et al., 2021), lack of data privacy (Krutka et al., 2019), algorithms of oppression (Benjamin, 2019), misinformation (Eckberg et al., 2018), and others. However, researchers still believe that social media has the potential to engage users through collaboration, allow connection with educational contexts, and help blur the line between formal and informal learning (Chen & Bryer, 2012; Greenhow & Lewin, 2016).

Many researchers have explored the potential of social media to help create outlets of informal learning while looking at different populations, settings, and platforms. For example, Fox and Ralston (2016) explored how social media served as informal learning environments for lesbians, gay, bisexual, transgender, questioning, and otherwise-identified (LGBTQ) individuals during formative stages of their LGBTQ identity. The results of this investigation showed that social media allowed participants to research a diversity of topics. One of the main benefits was that participants accessed the information they were seeking while having anonymity to accomplish their learning goals (Fox & Ralston, 2016). Social media as a tool for informal learning has also been studied by researchers wishing to better understand how and when K-16 teachers and instructors who use the various platforms for informal professional development benefit from it (Rehm & Notten, 2016; Greenhalgh & Koehler, 2017; Carpenter & Krutka, 2014). For example, Rehm and Notten (2016) looked at how Twitter contributed to continuous professional development of teachers by initiating and fostering informal learning. The results of the investigation supported this claim and, in fact, established that teachers' participation in hashtag conversations or chats contributed to structural formation of their social capital. Similarly, results were

obtained by Greenhalgh and Koehler (2017) who investigated the use of just-in-time professional development using a Twitter hashtag for French teachers preparing to discuss recent terrorist attacks with their students. Carpenter and Krutka (2014) also discussed how Twitter was credited, by teachers, with providing opportunities to access novel ideas and stay abreast of education advances and trends, particularly regarding educational technology. In the higher education setting, Chen and Bryer (2012) explored the use of social media among faculty in the discipline of public administration. The results were the same as those previously expressed in other studies; faculty felt that with adequate strategies social media could facilitate informal learning.

Researchers have also aimed to investigate how students use social media for informal learning and peer support outside the classroom when they are not required to engage and interact with an instructor. Garcia et al. (2015) found that social media outside the classroom resulted in the development of a complex, invisible, and organic social network amongst students. However, this investigation was not able to determine the nature of the interaction. In their investigation, Garcia et al. (2015) were not able to clarify if the students were interacting for social or informal learning reasons.

Theoretical Background, Purpose Statement, and Research Questions

Russo et al. (2009) stated that social media use has shifted the focus from institutional custodianship to a more participatory form of learning. This participatory form of learning is encouraged by both Vygotsky's Social Development Theory and Siemens' Connectivism Theory. According to Vygotsky's (1978) Social Development Theory, there are three critical components in the construction of knowledge: the zone of proximal development (ZPD), social interactions, and the more knowledgeable other (MKO). The ZPD refers to the distance between the actual development level while engaging in independent problem solving and the level of potential development while engaging in problem solving in collaboration with more capable peers (Vygotsky, 1978). The MKO refers to interactions with anyone who has a better understanding or a higher ability level than the learner with respect to a task, process, or concept. Last, social interactions refer to instances in which an individual comes in contact and interacts with others and that individual, in turn, starts to assimilate and internalize knowledge while adding their own value as well (Vygotsky, 1978). Vygotsky's (1978) Social Development Theory and specifically the social interaction element has major implications for informal learning facilitated by peer collaboration.

Connectivism further encourages learning in a participatory manner and considers these types of social engagements in a digital environment. According to Siemens (2005), connectivism theory implies that “learning can reside outside of ourselves, is focused on connecting specialized information sets, and the connections that enable us to learn are more important than our current state of knowing.” Several key principles of connectivism relate to the informal learning experiences that individuals experience while using online social communities. These principles are the following: a) learning and knowledge rests in diversity of opinions, b) learning is a process of connecting specialized nodes or information sources, and c) nurturing and maintaining connections is needed to facilitate continual learning (Siemens, 2005). Connectivism presents a theory in which learning is no longer an individualist process, instead learning is an open, connected, real-time, information flow between many individuals, in various in-person and digital settings.

Vygotsky’s Social Development Theory (1978) and Siemen’s Connectivism Theory (2005) raise awareness and provide value to the shared social interaction of peers who work on a task cooperatively or interact with one another. Given these two theoretical underpinnings and the value of shared social interactions during the learning process, this investigation focused on gaining an understanding of the deliberate informal learning activities performed by undergraduate students in their online social communities. In particular, this investigation aimed to gain insights on the deliberate informal learning activities performed by the learners’ while using their most used social media (MUSM) and least used social media (LUSM). This investigation also helped determine how frequently undergraduate students perform these deliberate informal learning activities. For this investigation, the MUSM is defined as the social media for which the participant had an account for and used the most. Similarly, the LUSM is defined as the social media for which the participant had an account for but would use the least. The research questions that guided this investigation were the following:

- RQ1: What deliberate informal learning activities do undergraduate students perform most when logged in to their MUSM?
- RQ2: What deliberate informal learning activities do undergraduate students perform most when logged in to their LUSM?
- RQ3: Does social media preference and rate of occurrence have an effect on the number of informal learning activities carried out by undergraduate students?

Methods

Recruitment

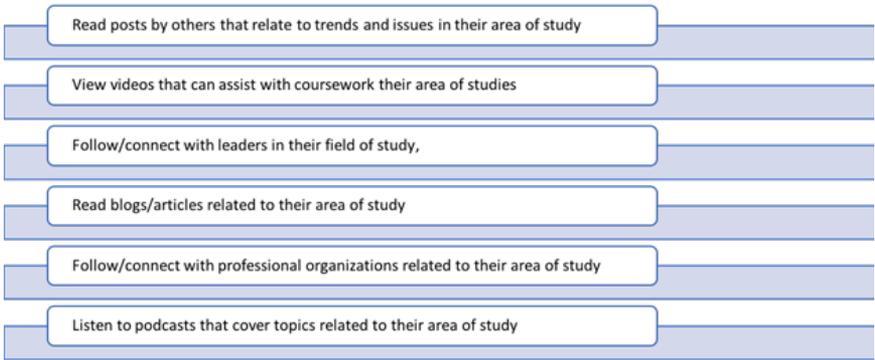
This investigation had IRB approval (IRB 18-008). Participants (n = 573) were undergraduate students attending an institution of higher education in the Southeastern United States. With approval of an IRB, the Office of Institutional Research provided to the principal investigator a password-protected MS Excel spreadsheet with emails of all undergraduate students enrolled at the institution (approximately 8,500 undergraduate students). The principal investigator used the Qualtrics email distribution setting to import the email addresses and send an invitation to participate to all undergraduate students included in the MS Excel spreadsheet. The email invitation to participate included the IRB approval number, the name and contact information of the principal investigator, the aim of the investigation, the amount of time it would take to complete the survey, the risks (if any) and benefits of participation, and the option to unsubscribe from reminder emails. The total recruitment period was one month. During the recruitment period, three reminder emails were sent out (one every two weeks). At the end of the data collection period, a thank you email was sent to participants.

Electronic Survey

The survey was created using Qualtrics. Once participants clicked on the survey link in the email invitation, they were asked to provide informed consent to participate. If a student consented to participate by selecting the “I consent to participate” option, they were directed to nine demographic questions. Following the demographic questions, participants were asked to respond to specific questions regarding their social media level of usage and participation. Participants were asked to categorize and rank six self-motivated deliberate informal learning activities performed in their MUSM and LUSM (see Figure 1). Participants categorized these deliberate informal learning activities depending on their rate of occurrence (i.e., most of the time, sometimes, and rarely) and also ranked them from 1 to 6 (“1” = performed most often and “6” = performed the least). These deliberate informal learning activities were selected based on research literature that established them as common informal learning activities performed by learners in social media (Romero-Hall, 2017b; Romero-Hall, 2017c).

Figure 1

Deliberate Informal Learning Activities performed in Social Media



A list of deliberate informal learning activities

Demographics of Participants

The investigation included participants who self-described as: males (n=129, 23%), females (n=439, 77%), and third gender (n=3, 1%). Most participants were in the 18- to 24-year-old age range (n=559, 98%), and a small percentage of the participants were in the 25- to 34-year-old age range (n=12, 2%). Based on their ethnicity, participants were White Caucasian (n = 393, 69%), Latinx or Hispanic (n=77, 13%), Black or African American (n=45, 8%), Asian or Pacific Islander (n=29, 5%), or other (n= 27, 5%).

As part of the demographic information, the electronic survey also included information related to the participants' academic standing and declared major. Participants belonged to the following academic standings: freshman (n=196, 34%), sophomore (n=120, 21%), junior (n=125, 22%), or seniors (n=132, 23%). Table 1 shows the academic majors that the participants belonged to at the time of the data collection. Overall, the participants in this investigation were undergraduate students studying a range of different academic majors.

Table 1

Academic Majors of the Participants

Majors	Total Number of Students
Public Health	45
Business Information Technology	43
Animation	37
Cybersecurity	37
Marketing	29
International Studies	26
Non-degree seeking	25
Advertising and Public Relations	21
Allied Health	21
Management Information Systems	21
Philosophy	20
Mathematical Programming	19
Sociology (Applied)	13
Theatre	13
Finance	12
Financial Enterprise Systems	12
Education - Secondary Biology	11
Graphic Design	11
Environmental Science	10
Psychology	10
Dance	9
International Business	9
New Media	8
Liberal Studies	7
Criminology and Criminal Justice	6
Journalism	6
Undecided	5
Biochemistry	5
Biology	5
Film and Media Arts	5
Art Therapy	4
Education - Elementary K-6	4
Education - Secondary Mathematics	4
History	4
Human Performance	4
Marine Chemistry	4
Spanish	4
Music Education (K-12)	3
Athletic Training	2
Chemistry	2
Economics	2
Education - Secondary Social Sciences	2
Music Theatre	2
Nursing	2
Education - Secondary English	1
English	1
Entrepreneurship	1
Forensic Science	1
Marine Science - Biology	1
Museum Studies	1
Music	1
Writing	1

The survey results indicated that the MUSM amongst the participants were Snapchat (n = 237, 41%) and Instagram (n = 216, 38%). A smaller percentage of participants considered Twitter (n = 48, 8%), Facebook (n = 41, 7%), and YouTube (n = 31, 5%) their MUSM. The results also showed that Facebook (n = 245, 43%), Twitter (n = 181, 32%), and YouTube (n = 78, 14%) were consider the LUSM amongst the participants. A small number of participants considered Snapchat (n = 42, 7%) and Instagram (n = 27, 5%) their LUSM.

Data Analysis

In order to determine if there is a significant difference between deliberate informal learning activities rankings in the MUSM and the LUSM, a Friedman test was performed. Friedman test is a non-parametric test for differences between groups when the dependent variable being measured is ordinal. Additionally, data analysis consisted of parametric statistical procedures. A two-way analysis of variance (ANOVA) was performed to examine the mean differences between the number of deliberate informal learning carried out by participants based on their social media preferences and the rate of occurrence preference.

Results

Deliberate Informal Learning Activities Performed by Undergraduate Students in their MUSM

A Friedman test was run to determine if there were differences in the rankings of informal learning activities performed by undergraduate students while logged in to their MUSM. The dependent variable was measured on an ordinal level using a 6-point scale ranking category explaining how often they would perform a specific informal learning activity. All assumptions required for the analysis were met. Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons. The analysis of the data indicated that there was a statistically significant difference between the rankings given by undergraduate students to deliberate informal learning activity carried out while logged in to their MUSM, $\chi^2(5) = 308.006, p = .000$ (see Table 2). Post hoc analysis revealed a statistically significant difference between rankings of the deliberate informal learning activities (see Table 3).

Table 2

Descriptive Statistics of the Deliberate Informal Learning Activities in the MUSM

Deliberate Informal Learning Activity	MUSM			
	n	Mean	SD	Median Ranking
Read posts that relate to their area of study	573	2.64	1.722	2
View videos that can assist with coursework	573	3.84	1.732	4
Follow/connect with leaders in their field of study	573	3.60	1.567	4
Read blogs/articles related to their area of study	573	3.22	1.512	3
Follow/connect with professional organizations	573	3.27	1.519	3
Listen to podcasts related to their area of study	573	4.44	1.622	5

Table 3

Pairwise Comparisons between the Rankings of the Deliberate Informal Learning Activities in the MUSM

Deliberate Informal Learning Activities	Mdn	Sig.
Read posts that relate to their area of study	2	
Read blogs/articles related to their area of study	3	.000
Follow/connect with professional organizations	3	.000
Follow/connect with leaders in their field of study	4	.000
View videos that can assist with coursework	4	.000
Listen to podcasts related to their area of study	5	.000
Read blogs/articles related to their area of study	3	
Follow/connect with leaders in their field of study	4	.010
View videos that can assist with coursework	4	.000
Listen to podcasts related to their area of study	5	.000
Follow/connect with professional organizations	3	
Follow/connect with leaders in their field of study	4	.047
View videos that can assist with coursework	4	.000
Listen to podcasts related to their area of study	5	.000
Follow/connect with leaders in their field of study	4	
Listen to podcasts related to their area of study	5	.000
View videos that can assist with coursework	4	
Listen to podcasts related to their area of study	5	.000

Deliberate Informal Learning Activities Performed by Undergraduate Students in their LUSM

A Friedman test was run to determine if there were differences in the rankings of informal learning activities performed by undergraduate students while logged in to their LUSM. The dependent variable was measured on an ordinal level using a 6-point scale ranking category explaining how often they would perform a specific informal learning activity. All assumptions required for the analysis were met. Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons. The analysis of the data indicated that there was a statistically significant difference between the ranks given to deliberate informal learning activity carried out in their LUSM, $\chi^2(5) = 255.478, p = .000$ (see Table 4). Post hoc analysis revealed a statistically significant difference between rankings of the deliberate informal learning activities (see Table 5).

Table 4

Descriptive Statistics of the Deliberate Informal Learning Activities in the LUSM

Deliberate Informal Learning Activity	LUSM			
	n	Mean	SD	Median Ranking
Read the posts that relate to their area of study	573	2.89	1.877	2
View videos that can assist with coursework	573	3.23	1.759	3
Follow/connect with leaders in their field of study	573	3.41	1.437	3
Read blogs/articles related to their area of study	573	3.27	1.463	3
Follow/connect with professional organizations	573	3.69	1.501	4
Listen to podcasts related to their area of study	573	4.51	1.701	5

Table 5

Pairwise Comparisons between the Rankings of the Deliberate Informal Learning Activities in the LUSM

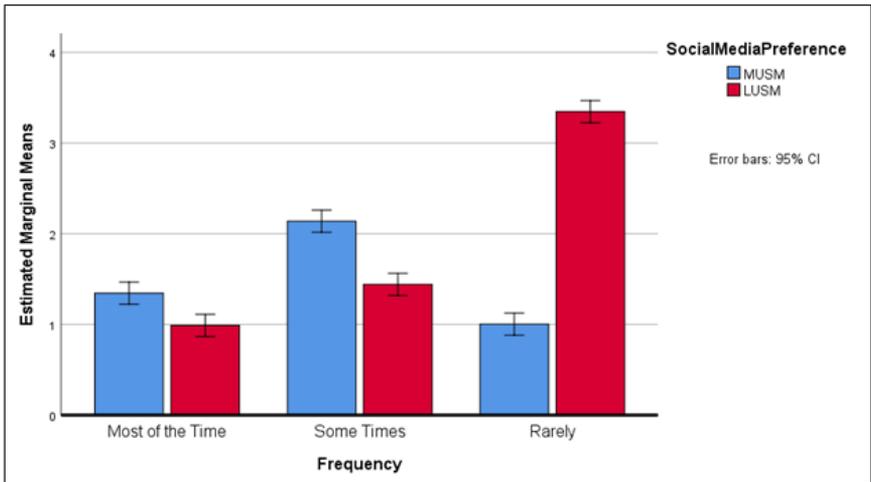
Deliberate Informal Learning Activity	Mdn	Sig.
Read posts that relate to their area of study	2	
View videos that can assist with coursework	3	.036
Read blogs/articles related to their area of study	3	.010
Follow/connect with leaders in their field of study	3	.000
Follow/connect with professional organizations	4	.000
Listen to podcasts related to their area of study	5	.000
View videos that can assist with coursework	3	
Follow/connect with professional organizations	4	.000
Listen to podcasts related to their area of study	5	.000
Read blogs/articles related to their area of study	3	
Follow/connect with professional organizations	4	.002
Listen to podcasts related to their area of study	5	.000
Follow/connect with leaders in their field of study	3	
Listen to podcasts related to their area of study	5	.000
Follow/connect with professional organizations	4	
Listen to podcasts related to their area of study	5	.000

Social Media Preference and Rate of Occurrence of Informal Learning Activities

A two-way analysis of variance (ANOVA) was conducted to examine the effect of social media preference and rate of occurrence of deliberate informal learning activities carried out by the participants. The independent variables were the social media preference (i.e., MUSM or LUSM) and rate of occurrence preferences (i.e., most of the time, sometimes, or rarely). The dependent variable was the number of deliberate informal learning activities carried out by the participants. There results of the two-way ANOVA showed that there was a statistically significant interaction between the social media preference and rate of occurrence of deliberate informal learning activities carried out by the participants, $F(2, 3563) = 356.344, p = .000$ (see Figure 2).

Figure 2

Estimated Marginal Means by Rate of Occurrence and Social Media Preference



A table showing social media preference

Discussion

The aim of this investigation was to explore which deliberate informal learning activities are performed by undergraduate students while participating in online social communities for personal purposes. The results of this investigation are critical because they allow us to more clearly see the landscape of knowledge creation and learning experiences in the digital age. The outcomes support the social nature (Vygotsky, 1978) and information flow (Siemens, 2005) of learning experiences in digital settings, in particular of informal learning endeavors in online social communities.

An analysis of the rankings provided by undergraduate students for the different deliberate informal learning activities performed in their MUSM showed that *listening to podcasts related to their area of study, following professional organizations, and connecting with leaders in their field of study* were ranked higher than other activities. The results also showed evidence of statistically significant differences in the ranking provided to the informal learning activities performed by undergraduate students in their LUSM. *Listening to podcasts related to their area of study, viewing videos that can assist with coursework, and following professional organizations* were ranked higher than the other deliberate informal learning activities.

A growing amount of research demonstrate that podcast use has been steadily

increasing over time (Bratcher, 2020). Approximately, 80 million Americans are now weekly podcast listeners, which is a 17% increase from 2020. Additionally, podcast listeners are now more diverse than ever, as 57% are White, 16% are Latinx, 13% are African American, 4% are Asian, and 10% are from other background (The Infinite Dial 2021, 2021). The findings also show that undergraduate students connect with professional organizations using social media. The reality is that professional organizations no longer rely solely on in-person meetings to engage with their memberships (Ritzhaupt et al., 2020). Instead, professional organizations are providing informal and supportive communication through the use of social media to improve member engagement (Wang et al., 2020).

The results also highlight the popularity of viewing videos shared in online social communities for informal learning. The Internet has facilitated and enabled self-directed, independent, and informal learning using video hosting and sharing platforms such as YouTube. An investigation conducted by Tan (2013) determined that videos shared on YouTube served to extend learners interactions with each other outside of the classroom and in some cases facilitated interactions that would not previously have happened. The outcomes of this investigation showcase that, regardless of the social media preference (i.e., MUSM or LUSM), learners deliberately engage in informal instruction in which they can exchange with others and absorb information from other individuals. Similar to the knowledge ecosystem model described by Miller et al. (2017), undergraduates students interact with an informal sphere of learning that considers both an outer focus with humans, tools, cultures, environments, and texts and inner focus that includes knowledge and information resources. Today, learners at all educational levels are regularly accessing digital and networked technologies to seek information and they are also active co-creators of content (Dabbagh & Kitsantas, 2012).

Significance of this Research

Data from 2021 shows that globally there are approximately 4.2 billion social media users (Global Social Media Stats). In the United States, as of 2021, 72% of Americans use social media sites (Pew Research Center, 2021). People are using social media to engage with others (Romero-Hall, 2017a) and to engage in informal learning experiences (Rehm & Notten, 2016; Tucker, 2019; Chen & Bryer, 2012; Fox & Ralston, 2016; Garcia et al., 2015; Russo et al., 2009). Knowing which types of deliberate informal learning activities undergraduate students engage in benefits instructors in institutions of higher education. It can enable instructors, regardless of the discipline of study, to connect academic

assignments with those informal learning activities that undergraduate students are already performing for personal purposes. Ideally, instructors aim to nurture learners that engage in a personalized and self-directed journey bridging formal, non-formal, and informal learning experiences as part of a *lifelong learning ecology* (Sangrà et al., 2019).

Additionally, gaining insights into the types of informal learning activities that undergraduate students are performing in the MUSM and LUSM illustrates worthwhile activities that social media users engage in while using these platforms. Today there is still a tremendous amount of skepticism toward the use of social media due to well established and researched risks (Eckberg et al., 2018; Shensa et al., 2016; Whaite et al., 2018). Yet, it is equally important to acknowledge how and when adequate uses of these affinity spaces can have a positive purpose. This investigation helps us gain an understanding on how this specific population, undergraduate students, use social media in their everyday lives. As the number of users of social media continues to grow and evolve, these platforms have a more prevalent presence in our lives. Gaining an understanding of their impact, positive or negative, increases our awareness of their role in education for both formal and informal experience.

Future Research

Further research related to informal learning activities in social media can focus on other age groups (i.e., teenagers, tweens) or learners in specific majors. It can also consider similar research in a different type of higher education institution, perhaps a large public university or historically black colleges and universities (HBCU). Last, future research should aim to include qualitative elements that shed light on undergraduate students' other types of informal learning activities.

References

- Benjamin, R. (2019). *Race after technology*. Polite Press.
- Bratcher, T.R. (2020). Toward a deeper discussion: A survey analysis of podcasts and personalized politics. *Atlantic Journal of Communication*.
<https://doi.org/10.1080/15456870.2020.1862846>
- Carpenter, J., & Krutka, D. (2014). How and why educators use Twitter: A survey of the field. *Journal of Research on Technology in Education*, 46, 414-434.
<https://edtechbooks.org/-yXJE>

- Chen, B., & Bryer, T. (2012). Investigating instructional strategies for using social media in formal and informal learning. *International Review of Research in Open & Distance Learning*, 13(1), 87-104. <https://edtechbooks.org/-FrS>
- Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education*, 15(1), 3-8. <https://edtechbooks.org/-arLz>
- Eckberg, D.A., Densley, J., & Dexter, K. (2018). When legend becomes fact, tweet the legend: Information and misinformation in the age of social media. *Journal of Behavioral & Social Sciences*, 5(3), 148-156.
- Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education*, 26(2), 247-273. <https://edtechbooks.org/-Gao>
- Fox, J., & Ralston, R. (2016). Queer identity online: Informal learning and teaching experiences of LGBTQ individuals on social media. *Computers in Human Behavior*, 65, 635-642. <https://edtechbooks.org/-xqtc>
- Gao, F., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008-2011. *British Journal of Educational Technology*, 43(5), 783-801. <https://edtechbooks.org/-YnMV>
- Garcia, E., Elbeltagi, I.M., Dungay, K. and Hardaker, G. (2015). Student use of Facebook for informal learning and peer support. *International Journal of Information and Learning Technology*, 32(5), 286-299. <https://edtechbooks.org/-UbZd>
- Data Reportal. (2021, March 31). *Global Social Media Stats*. Retrieved April 13, 2021 from <https://edtechbooks.org/-doht>
- Greenhalgh, S. P., & Koehler, M. J. (2017). 28 days later: Twitter hashtags as “just in time” teacher professional development. *TechTrends*, 61(3), 273-281. <https://edtechbooks.org/-Wwoq>
- Greenhow, C., & Lewin, C. (2016). Social media and education: reconceptualizing the boundaries of formal and informal learning. *Learning, Media and Technology*, 41(1), 6-30. <https://edtechbooks.org/-zxeQ>
- Gosse, C., Veletsianos, G., Hodson, J., Houlden, S., Dousay, T., Lowenthal, P. & Hall, N. (2021). The hidden costs of connectivity: Nature and effects of

scholars' online harassment, *Learning, Media and Technology*. <https://edtechbooks.org/sioi>

- Krutka, D. G., Manca, S., Galvin, S., Greenhow, C., Koehler, M., & Askari, E. (2019). Teaching "against" social media: Confronting of profit in the curriculum. *Teachers College Record*, 121(14), 1-19. <https://edtechbooks.org/JHKU>
- Lau, W. W. F. (2017). Effects of social media usage and social media multitasking on the academic performance of university students. *Computers in Human Behavior*, 68, 286-291. <https://edtechbooks.org/RcAF>
- Manca, S., & Ranieri, M. (2016). Facebook and the others. Potentials and obstacles of social media for teaching in higher education. *Computers & Education*, 95, 216-230. <https://edtechbooks.org-HEYUF>
- Manca, S., & Ranieri, M. (2017). Implications of social network sites for teaching and learning. Where we are and where we want to go. *Education and Information Technologies*, 22(2), 605-622. <https://edtechbooks.org-VyCA>
- Miller, F., Partridge, H., Bruce, C. & Hemmings, B. (2017). Designing informal learning experiences for early career academics using a knowledge ecosystem model. *Journal of Further and Higher Education*, 41(5), 692-705. <https://edtechbooks.org-LCRo>
- Moore, A. (2016). *The business of informal learning: A survey of instructional design and performance improvement practitioners* [Doctoral dissertation Florida State University]. DigiNole: FSU's Digital Repository. <https://edtechbooks.org-Gef>
- Pew Research Center. (2021, April 26). *Demographics of social media users and adoption in the United States*. Pew Research Center: Internet, Science & Tech. Retrieved April 1, 2021, from <https://edtechbooks.org-zJgI>
- Rehm, M., & Notten, A. (2016). Twitter as an informal learning space for teachers!? The role of social capital in Twitter conversations among teachers. *Teaching and Teacher Education*, 60, 215-223. <https://edtechbooks.org-Cryr>
- Richter, D., Kunter, M., Klusmann, U., Lüdtke, O., & Baumert, J. (2011). Professional development across the teaching career: Teachers' uptake of formal and informal learning opportunities. *Teaching and Teacher Education*, 27(1), 116-126. <https://edtechbooks.org-vdbk>

- Ritzhaupt, A. D., Stefaniak, J., Conklin, S., & Budhrani, K. (2020). A study on the services motivating instructional designers in higher education to engage in professional associations: Implications for research and practice. *The Journal of Applied Instructional Design*, 9(2). <https://dx.doi.org/10.51869/92adrjssckb>
- Romero-Hall, E.J. (2017a). Social media in higher education: Enriching graduate students' professional growth outside the classroom. In S. Şad & M. Ebner (Eds.), *Digital Tools for Seamless Learning*, pp. 255-277. IGI Global.
- Romero-Hall, E.J. (2017b). Posting, sharing, networking, and connecting: Use of social media content by graduate students. *TechTrends*, 61 (6), 580-588. <https://edtechbooks.org/-eoSM>
- Romero-Hall, E.J. (2017c). Active user or lurker? A phenomenological investigation of graduate students in social media spaces. *International Journal of Social Media and Interactive Learning Environments*, 5(4), 326-340. <https://edtechbooks.org/-VzEP>
- Russo, A., Watkins, J., & Groundwater-Smith, S. (2009). The impact of social media on informal learning in museums. *Educational Media International*, 46(2), 153-166. <https://edtechbooks.org/-iUkq>
- Sangrà, A., Raffaghelli, J. E., & Veletsianos, G. (2019). Lifelong learning Ecologies: Linking formal and informal contexts of learning in the digital era. *British Journal of Educational Technology*, 50(4), 1615-1618. <https://edtechbooks.org/-QrWr>
- Shensa, A., Sidani, J., Lin, L., Bowman, N. D., & Primack, B. (2016). Social media use and perceived emotional support among U.S. young adults. *Journal of Community Health*, 41(3), 541-549. <https://edtechbooks.org/-umRo>
- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10. <https://edtechbooks.org/-yfk>
- Tan, E. (2013). Informal learning on YouTube: exploring digital literacy in independent online learning. *Learning, Media and Technology*, 38(4), 463-477. <https://doi.org/10.1080/17439884.2013.783594>
- Terry, C. A., Mishra, P., & Roseth, C. J. (2016). Preference for multitasking, technological dependency, student metacognition, & pervasive technology

use: An experimental intervention. *Computers in Human Behavior*, 65, 241-251. <https://edtechbooks.org/kKz>

The Infinite Dial 2021. (2021). Edison Research. Retrieved April 1, 2021, <https://edtechbooks.org-XqQL>

Tucker, L. (2019). Educational professionals' decision making for professional growth using a case of Twitter adoption. *TechTrends*, 63(2), <https://doi.org/133-148>. 10.1007/s11528-018-0346-x

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wang, P., Morgan, B., Packard, P., Goode, V., & Tola, D. (2020). Maximizing use of social media to improve member engagement in a professional organization. *AANA Journal*, 88(6), 473-478.

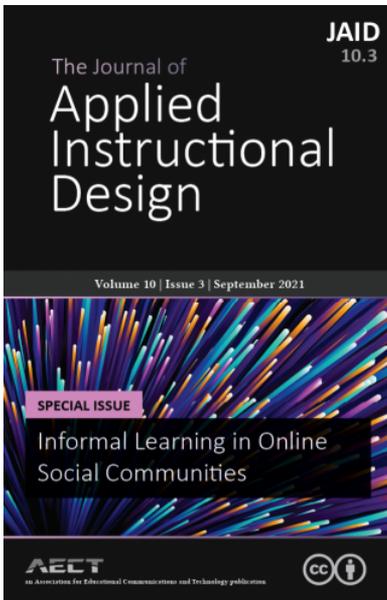
Werquin, P. (2007). Moving mountains: Will qualifications systems promote lifelong learning? *European Journal of Education*, 42(4), 459-484. <https://edtechbooks.org-uWv>

Whaite, E. O., Shensa, A., Sidani, J. E., Colditz, J. B., & Primack, B. A. (2018). Social media use, personality characteristics, and social isolation among young adults in the United States. *Personality & Individual Differences*, 124, 45-50. <https://edtechbooks.org-bdfT>

Wu, J.-Y. (2017). The indirect relationship of media multitasking self-efficacy on learning performance within the personal learning environment: Implications from the mechanism of perceived attention problems and self-regulation strategies. *Computers & Education*, 106, 56-72. <https://edtechbooks.org-EqQq>

Acknowledgements

This work was supported by The University of Tampa under a Research Innovation and Scholarly Excellence (RISE) Grant [GR0038].



Romero-Hall, E. (2021). Undergraduate Students in Online Social Communities: An Exploratory Investigation of Deliberate Informal Learning Practices. *The Journal of Applied Instructional Design*, 10(3). <https://dx.doi.org/10.51869/103/erh>