

INFLUENCE OF FACEBOOK AS A PEDAGOGICAL INTERACTION TOOL ON LEARNING OUTCOME AMONG LEARNERS IN SECONDARY SCHOOLS IN KENYA

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Abstract

There is high infiltration of Online Social Networking Platforms in learning institutions in Kenya yet there is dearth of information on how these platforms affect learning outcome. This paper was a systematic desk literature review. The purpose was to establish how leveraging on pedagogical interactions through Facebook affect learning outcome. The reviewers focused on the development of Facebook, its use in education and how its pedagogical interactions affect learning outcome. Articles published in high impact journals including “grey literature” were desk reviewed. The review showed that Facebook has been used by learners mostly for social interactions and not for pedagogical interactions and its use can boost learning outcome. The researcher recommends that learners, teachers and policy makers should accept Facebook as a pedagogical interaction tool.

Keywords: *Pedagogical interaction, Facebook, Learning outcome*

1.0 Introduction

Learning outcome measures the amount of academic content a learner has mastered in a determined amount of time. Learning outcome is influenced by several factors among them teaching approach adopted, learner characteristics, teacher characteristics, learning environment and instructional resources (Wachanga and Mwangi, 2004; Alos, Caranto and David, 2015; Wambugu and Chengeiywo, 2008; Filgona, Filgona and Sababa, 2017; Keter, Wachaga and Anditi, 2017). Pedagogical interactions that are learner centered have been found to yield better learning outcomes (Muriithi, 2013; Wambugu and Chengeiywo, 2008). In order to boost learning outcome among learners, curriculum implementers have been concerned in ways of enhancing pedagogical interactions which have been found to determine learning outcome in virtual or physical learning environments. In support of this, Hay, Hodgkinson, Peltier & Drago (2004) opine that pedagogical interactions enhance learner involvement, increase learning opportunities, motivate learners and lead to better learning outcome. This calls for teachers and learners to optimize on any pedagogical interaction that would enhance learning outcome. Costaa, Ana, Limac, Manuela and Jose (2011)

identify such pedagogical interactions as teacher-learner interaction, learner-learner interaction and learner-content interaction.

Educational stakeholders should create learning environments, physical or virtual that supports such pedagogical interactions (Costaa et al., 2015). The adoption of social network virtual learning communities in the teaching and learning practices has led to a paradigm shift in pedagogical interactions (Ng'ambi, 2013).

This is an indication that pedagogical interactions through the VLCs influence the pedagogical interaction outcomes. In concurring to this view, Dolphy (2015) observed a positive relationship between VLCs and pedagogical interaction outcomes. This is an indication that if a Facebook VLC is used objectively for pedagogical interactions, positive learning outcomes may be achieved. The argument by Ng'ambi (2013) and Dolphy (2015) is a pointer to the need of educational stakeholders to leverage pedagogical interactions through online platforms that support VLCs for optimal learning outcomes. Supporting this position, Hamid, Waycott, Kurnia and Chang (2015) opine that students are able to leverage pedagogical interactions through VLCs created using social networking technologies which enhance student-student, student-tutor and student-content interactions. The social networking technologies provide flexible virtual learning environment for pedagogical interactions. Ali, Raja, Mohd and Naseeb (2016) alluded to this when they observed that use of technologies such as social networking technologies for pedagogical interactions strengthen learning more than use of common instructional approaches. One such technology which has been assimilated in education for creating VLC is Facebook because of its ability to support communication, collaboration, cooperative learning, creativity and media convergence is the Facebook online social networking platform.

Ali et al.'s (2016) observation concurred with Irwin, Lauren and Ben (2012) who had observed a good reception of Facebook by students as an integrated technology that delivers learning materials in a similar way to the conventional learning management systems. This indicates that, due to its interactive nature, a Facebook VLC would facilitate better pedagogical interactions than a conventional classroom. In concurring to this, Mayende, Muyinda, Isabwe, Walimbwa and Simiyu (2014) argued that Facebook provide interactive learning environment where learners establish sense of presence and belonging where they interact with each other, their tutors and content. Further, Hamid et al. (2015) in their study on university students' perception on use of online social networking technologies such as Facebook, they observed that such technologies enabled learners to engage more with content, engage in peer learning, promote critical thinking, support self-directed learning, enable self-monitoring of learning progress, provide a platform to interact with instructors, make learning entertaining and create an interactive learning environment. Hamid et al. (2015) confirms the utilization of Facebook VLC for pedagogical interactions. However, this continues to raise the question of the effect of pedagogical interactions through Facebook VLC on learner academic achievement. Even though high satisfaction among students who interact on social networking technologies such as Facebook has been recorded (Al-Rahmi and Othman, 2016), there is need to determine with precision the effect of these pedagogical interactions on learner academic

achievement. The observations by Mayende et al. (2014) and Hamid et al. (2015) arouse the need for this kind of review to be carried out to establish how leveraging Facebook VLCs pedagogical interactions affect learner academic achievement as a learning outcome.

1.1 Statement of the problem

Low learning outcomes have been reported in Kenya often when national examination results are released. Such outcomes have been attributed to various factors such as instructional strategies employed by teachers, teacher characteristics, learning environment, learner characteristics and instructional resources (KNEC, 2017). These factors determine pedagogical interactions which in turn influence learning outcomes. Other factors affecting learning outcomes have emerged due to the need to integrate technology in teaching and learning. These include use of virtual learning communities supported by Facebook among other online social networking platforms. This has necessitated this study to establish how pedagogical interactions through Facebook influence learning outcomes among secondary school learner in Kenya.

1.2 Purpose of the study

The Purpose of this study was to establish how pedagogical interactions through Facebook influence learning outcomes among learners in secondary schools in Kenya.

1.3 Objective of the study

The research objectives that guided this study are;

- i) Examine the development of Facebook
- ii) Establish use of Facebook in teaching and learning
- iii) Examine use of Facebook in supporting virtual learning communities
- iv) Assess how pedagogical interactions via Facebook influence learning outcome

2.0 Research Methodology

The methodology used was a desk literature review. The researchers examined peer reviewed journals and grey literature related to development of Facebook, its use in teaching and learning, its use in virtual learning communities and how pedagogical interactions through it influence learning outcomes.

3.0 Findings and Discussion

3.1 Development of Facebook and infiltration in education

Facebook was developed by Harvard University students led by Mark Zuckerberg in 2004 (Wikipedia, 2017). It has since developed from a student's project to the World's most popular online social networking platform hence cutting the highest niche among its users. For instance, Junco, Heibergert and Loken (2010) acknowledged Facebook as the World's most popular OSNP alongside Twitter, Skype, WhatsApp, Google plus, Instagram and YouTube. Facebook has since gained huge popularity among its users mostly the youth in schools and colleges. This is evident in

a report by Gordon (2017) who put Facebook users at slightly over 1.97 Billion compared to other OSNP which register between 300 Million and 1 Billion users as shown in Figure 1.0.

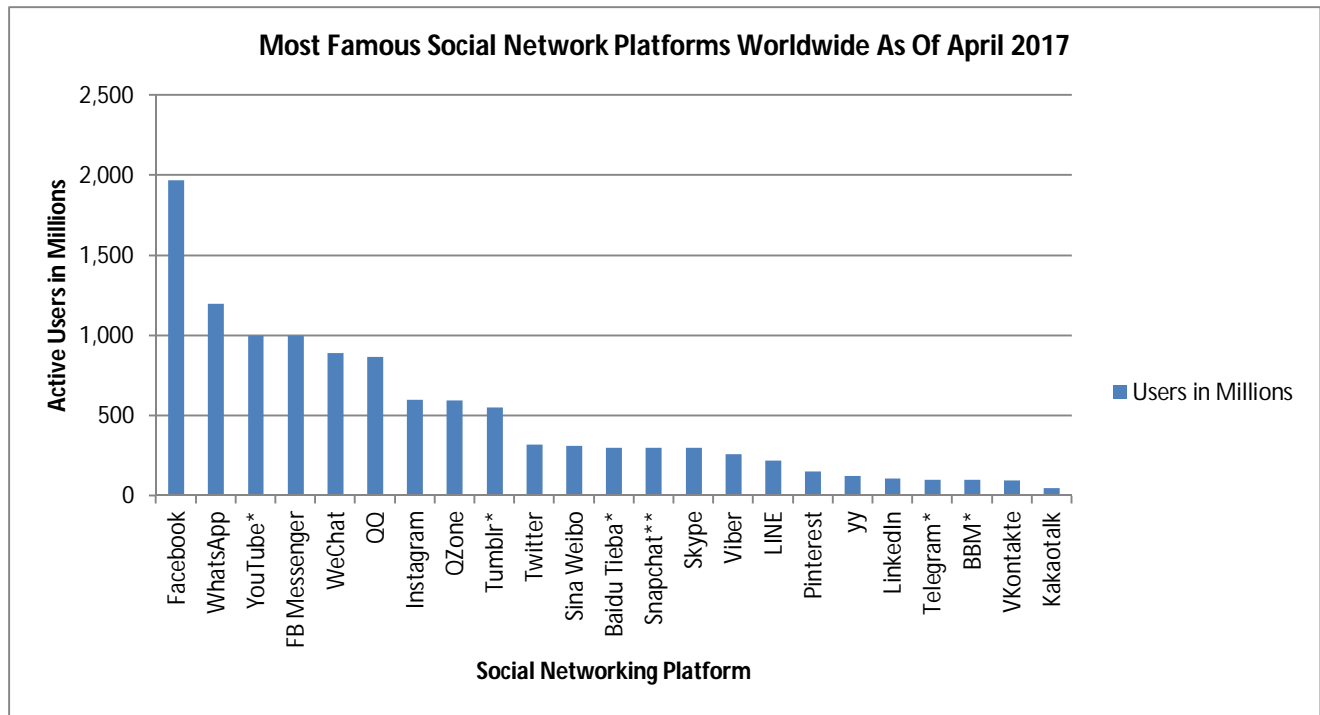


Figure 1.0: Online social networking platforms by the number of active users.

Nadkarni & Hofmann (2012) attributed this growth to the need to belong and the need for self-presentation among the youth in schools and colleges. This growth has led to high infiltration of Facebook in schools and colleges which raises eyebrows on its effects on learner academic achievement.

Figure 1.0 indicates that Facebook is the largest and the fastest growing online social networking platform especially among youths in Africa. In Kenya for instance, Socialbaker (2015) noted that Facebook has over 2,018,560 users representing 5.04% of the total population. He further noted that 19.24% of the online population majority are youths aged between 18 and 24 years in schools and colleges. Like any other online social networking platform, the popularity of Facebook among the youth is attributed to its power to influence, connect and mobilize people (Guo, Pathak & Cheng, 2015). This high popularity of Facebook among the youths has resulted in creating a virtual learning community whose potential can be exploited for learning purposes.

3.2 Use of Facebook in teaching and learning

Over the years, face-to –face mode of learning has been practiced in many education tiers all over the world. This mode implies situation where students sit in a classroom environment as the teacher manages the learning process. However, it is now inevitable to use 21st century pedagogical

approaches and technologies appropriate to the current digital age. Such technologies that have led to paradigm shift in pedagogical approaches include online social networking tools like Facebook, WhatsApp, MySpace, Twitter and Telegram among others.

Use of emerging technologies is gaining momentum in education. In a study to investigate whether there is a role for social networking sites in education in Singapore, Santos, Hammond & Chou (2009) observed that social networking tools have been accepted by teachers and students for instructional purposes. Further, in a related study in University of Cape Town exploring student use of Facebook and lecturer involvement, Bosch (2009) observed that despite certain challenges like ICT literacy levels, difficult in access to Internet among other challenges, OSNP are beneficial in teaching and learning especially in establishing educational micro-communities. In supporting this view, Bicen and Cavus (2011) argued that OSNP like Facebook provide learners with a platform for establishing, maintaining and strengthening social collaborations which can be of benefit to social and academic achievement of learners. Further, Pimmer, Linxen and Gröbhiel (2012) found that students and professionals approved Facebook as a learning tool suitable for sharing educational content and establishing virtual communities for academic and professional interactions in informal contexts similar to the formal context. However, these studies do not tell us more about the pedagogical implications of these online social networking tools on learner academic achievement.

Similarly, in a study involving teacher trainees and their tutors in institutions offering Bachelor of Education in Delhi, India, Singh (2013) concluded that students and their tutors used Facebook to share news, classroom updates, presentations, photos, events and any other information related to their campuses. In supporting this contention, Celik, Yurt & Sahin (2015) argued that Facebook can be used for educational purposes whose use could affect academic achievement positively. Further, Hamid et al. (2015) observed that technologies such as Facebook when used for educational purposes, are beneficial to the learner because it enables learners to engage more with content, engage in peer learning, promote critical thinking, support self-directed learning, enable self-monitoring of learning progress, provide a platform to interact with instructors, make learning entertaining and create an interactive learning environment.

However, from this literature reviewed, it is evident that the use of Facebook in education is not without challenges. Bosch (2009) observes low ICT literacy levels and uneven access as the key among these challenges. Abdulahi, Samadi and Gharleghi (2014) point out more of these challenges as health issues resulting from addiction, lack of privacy and security issues due to over exposure of students to Facebook. However, it is also evident that the benefits of using Facebook outweigh the challenges and therefore, teacher, students and other education stakeholders should have no excuse of not embracing Facebook and other emerging technologies in education. In supporting this, Bolaji, Longe & Odefunso (2014) observed that though the use of social networking sites like Facebook has a lot of concerns and challenges, the benefits far outweighs the challenges and rather than ban the use of OSNPs by students, they should rather be educated on responsible, ethical and safe ways of using them.

3.3 Use of Facebook as a virtual learning community technology

In a study involving undergraduate students, Sarsar and Harmon (2011) observed that Facebook could support e-learning in higher education and learners liked to be part of the learning environment supported by Facebook. Supporting this, Cain & PolICASTRI (2011) observed that Facebook offer an informal learning environment where up-to-date academic content can be shared between teachers, learners and guest experts through collaborations. Supporting this, Lenhart (2015) opined that Facebook has a high potential to be used by students to converge, collaborate, share and learn and as such, educationists should devise methods of harnessing the potential of this platform. Alluding to this, Stanley (2017) argue that with the recent advent and deployment of virtual learning communities, Facebook is an ideal platform for supporting such learning communities where students and teachers can manage and share educational materials. Even though this reviewed literature does not emphasize on the effect of Facebook on learner academic achievement, it is evident that, institutions that offer courses through distance modes can leverage on the potential of Facebook virtual learning communities which is widely accessible and affordable to the students and instructors. Such institutions should explore on the best approaches for adopting Facebook and other online platforms that can support virtual learning community for optimal pedagogical interactions.

It is evident from the literature reviewed that Facebook can be used to establish virtual learning communities where teachers and learner can interact for academic benefits. Mazer, Murphy & Simonds (2007) observed that the teacher-learner relationship can be nurtured through Facebook for positive learning. In similar findings, Lampe, Wohn, Vitak, Ellison & Wash (2011) in their study on students' use of Facebook to organize collaborative class activities, they observed that learners collaborate on learning activities through Facebook but recommended further studies to establish whether such collaborations could influence learning outcomes like learner motivation, self-efficacy and the levels of learner content interactions.

In a separate study in South Africa, Mbodila, Ndebele and Muhandji (2014) observed that use of Facebook enhanced students' interactions and collaborations making it viable tool for creating virtual learning communities. Similarly, in a study in Canada on Facebook intervention to teach *Introduction to Psychology* students, Dyson, Kristin, Turtle, Cowan & Tassone (2015) observed that unlike students who actively interacted through Facebook, those who did not registered lower engagement, low comprehension of the content discussed and low appreciation of Facebook content and lecture materials. This is an indication that Facebook can be helpful in establishing virtual learning communities where pedagogical interaction can take place just like through other online learning management systems.

3.4 Effect of Facebook pedagogical interactions on Learning Outcomes

Pedagogical interactions enhance student involvement, increase learning opportunities, motivate learners and affect learning outcomes (Hay et al., 2004). This implies that facilitating pedagogical

interactions through Facebook virtual learning community would have some positive or negative effects on learning outputs. Various studies at different parts of the World have reported different findings on the effect of Facebook on learning outcomes. For instance, in a study involving university students in the United States, Kirschner and Karpinski (2010) found that Facebook had negative effect on academic performance among its users who recorded lower GPAs and spend less time studying. Similar findings were reported by Ogedebe, Emmanuel and Musa (2012) who in a survey study on Facebook and academic performance in Nigerian Universities, observed that students who used Facebook had lower GPA than those who did not. These findings by Kirschner and Karpinski (2010) and Ogedebe et al. (2012) were further affirmed by Kirschner & Karpinski (2013) who noted that learners who used Facebook for academic work had significantly lower GPA compared to the non-users. Similarly, in a study involving Sri Lankan University Students on influence of Facebook on their academic performance, Thuseethan & Kuhanesan (2014) observed that most of the frequent users of Facebook recorded lower academic performance than the less frequent users.

However, in a slight deviation from these findings Ku, Lin and Tsai (2012) through an experimental study on use of Facebook to teach computer science, they observed that interactions through the Facebook virtual learning community affected students' attitude towards computer science and there were no significant differences in academic achievement between those who heavily used Facebook and those who did not. Similarly, Amukune (2014) in an unpublished thesis on the perceived effects of social networking on learning behaviour among regular undergraduate university students in Mombasa County in Kenya observed that Facebook did not have an adverse effect on learner academic performance.

On the contrary, results from a study by Celik, Yurt & Sahin (2015) involving undergraduate students in the College of Education at an Anatolian University in Turkey, showed that students who used Facebook for educational purposes had higher academic achievement because they used it more often, had fewer friends and spend less time on it. From this literature, it is evident that the use of Facebook as a platform for virtual learning communities may not or may positively or negatively affect learning outcomes. The study by Celik et al. (2015) indicates that if the use of Facebook among learners is controlled, positive impact on learning outcomes can be realized. Controlling the use would ensure meaningful pedagogical interactions take place through the Facebook virtual learning communities. This is a clarion call to teachers, learners and other education stakeholders to embrace Facebook as a technology that can be used to create formal virtual learning communities in educational institutions to leverage on the benefits that accrue from it and extend access to education beyond the classroom setting.

4.0 Summary of the Findings

The literature reviewed has shown that Facebook has undergone several stages of development from student project to a major social networking platform used for various reasons and is easily accessible by various clientele through computers and mobile phones. Use of Facebook is gaining

momentum in educational sector. The review findings have further shown that pedagogical interactions through Facebook influence learning outcome in different ways. In some instances, Facebook has been found to have no effect on academic performance among its users most of whom are the youth in schools and colleges, while in others it has been found to have positive or negative effects on learning performance. However, Facebook has become part of the students and they are using it even while in school. Instead of condemning it, parents and teachers should devise ways of leveraging its use among students for optimal pedagogical interactions and better learning outcomes. Celik et al. (2015) supports this in noting that high academic performance can be realized if Facebook is used responsibly by teachers and learners for optimal academic performance. This is confirmed by Albayrak and Yildirim (2015) who observe that Facebook has the potential to enhance student involvement in discussions and out-of-class communication among instructors and students. This clearly indicates that educational stakeholders can leverage on pedagogical interactions via Facebook supported virtual learning communities for optimal learning outcomes.

4.1 Conclusion

From the literature reviewed, it is evident that Facebook has infiltrated the education sector just like any other sector and teachers and students are accepting it as a viable platform for pedagogical interactions. For instance, Al-Rahmi and Othman (2016) opine that teachers and students are satisfied with the use of Facebook in a learning environment. Further, Facebook essentially facilitate communication, collaboration, creativity and convergence among parties interacting through it (Lenhart, 2015). This makes it a potential tool for creating virtual learning communities where pedagogical interactions such as student-student, student-teacher and student-content interaction can take place, a view supported by Mbodila et al (2014) who observe that Facebook enhance student-student interaction and collaboration for learning purposes.

4.2 Recommendations

In view of the research findings, the researchers make the following recommendations:

- i. Parents, teachers and learners should embrace Facebook as an emerging pedagogical interaction tool and utilize it for academic purposes to boast learning outcome
- ii. Educational managers and other stakeholders should develop policies that support embracing of Facebook as one of the emerging technologies for pedagogical interactions
- iii. Empirical studies should be carried out in Kenya to establish the effect of Facebook and other emerging technologies on learning outcome in specific subject areas.

References

- Abdulahi, A., Samadi, B. & Gharleghi, B. (2014). A Study on the Negative Effects of Social Networking Sites Such as Facebook among Asia Pacific University Scholars in Malaysia. *International Journal of Business and Social Science* Vol. 5, No. 10; September 2014.
- Abrantes, J. L., Seabra, C., & Lages, L. F. (2007). Pedagogical affect, student interest, and learning performance. *Journal of Business Research*, 60(9), 960-964. doi:10.1016/j.jbusres.2006.10.026
- Albayrak, D. and Yildirim, Z. (2015). Using Social Networking Sites for Teaching and Learning. *Journal of Educational Computing Research*, 52(2), pp.155-179.
- Ali, M., Raja, Y., Mohd, E., & Langove, N. (2016). Strengthening the academic usage of social media - An exploratory study. *Journal of King Saud University – Computer and Information Sciences*. doi:10.1016/j.jksuci.2016.10.002
- Al-Rahmi, W. & Othman, M. (2016). The Impact of Social Media use on Academic Performance among university students: A Pilot Study. *Journal of Information Systems Research and Innovation*. Retrieved from <https://www.researchgate.net/publication/283723637>
- Amukune, S. (2014). Perceived Effects of Social Networking on Learning Behaviour among Regular Undergraduate University Students in Mombasa County – Kenya. Retrieved from <http://ir-library.ku.ac.ke/handle/123456789/9066>
- Bicen, H. & Cavus, N. (2011). Social network sites usage habits of undergraduate students: case study of Facebook. *Procedia - Social and Behavioral Sciences* 28 (2011) 943 – 947
- Bolaji, A. & Longe, B., Odefunso, E. (2014). Integrating Social Media Use in Secondary School Education. *Journal Scientific*, 2014 Edition, No 1. Retrieved from <http://www.cisdijournal.net/uploads/JASRA-V1N1P7.pdf>
- Bosch, T. (2009). Using online social networking for teaching and learning: Facebook use at the University of Cape Town. *South African Journal for Communication Theory and Research*, 35:2, 185-200, DOI: 10.1080/02500160903250648
- Cain, J., & Policastri, A. (2011). Using Facebook as an Informal Learning Environment. *American Journal of Pharmaceutical Education*, 75(10), 207. doi:10.5688/ajpe7510207
- Celik, I., Yurt E. & Sahin I. (2015). A Model for Understanding Educational Facebook Use. *Eurasia Journal of Mathematics, Science & Technology Education*, 2015, 11(4), 899-907, DOI: 10.12973/eurasia.2015.1447a

- Costaa, C., Ana, C., Limac, M., Manuela, F., & José, A. (2015). Pedagogical interaction and learning performance as determinants of academic achievement. *Procedia - Social and Behavioral Sciences* 171 (2015) 874 – 881. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1877042815002335?via%3Dihub>
- Dolphy, L. (2015). Techniques and Tools: Effectiveness of Research-based Pedagogical Techniques through Online Learning Tools with Secondary Students. Unpublished thesis.
- Dyson, B. Kristin, V., Turtle, J., Cowan, S. & Tassone, A. (2015). Evaluating the use of Facebook to increase student engagement and understanding in lecture-based classes. *High Educ (2015)* 69:303–313. DOI 10.1007/s10734-014-9776-3
- Gordon, K. (n.d.). Topic: Social Media Statistics. Retrieved June 30, 2017, from <https://www.statista.com/topics/1164/social-networks/>
- Guo, H., Pathak, P., Cheng, H. (2015). Estimating Social Influences from Social Networking Sites - Articulated Friendships versus Communication Interactions. A Journal of the Decision Sciences Institute. Volume 46 Number 1.
- Hamid, S., Waycott, J., Kurnia, S., & Chang, S. (2015). Understanding students' perceptions of the benefits of online social networking use for teaching and learning. **The Internet and Higher Education**, 26, 1-9. doi:10.1016/j.iheduc.2015.02.004
- Hay, A., Hodgkinson, M., Peltier, J., & Drago, W. (2004). Interaction and virtual learning. *Strategic Change*, 13 (4), 193-204.
- https://en.wikipedia.org/wiki/History_of_Facebook, accessed on 14/2.2018
- Irwin, C., Lauren, B. & Desbrow, B. (2012). Students' perceptions of using Facebook as an interactive learning resource at university. *Australasian Journal of Educational Technology* 2012, 28(7), 1221-1232
- Junco, R., Heiberger, G., & Loken, E. (2010). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, 27(2), 119-132. doi:10.1111/j.1365-2729.2010.00387.x
- Kirschner, P. and Karpinski, A. (2010). Facebook® and academic performance. *Computers in Human Behavior*. Volume 26, Issue 6, November 2010, Pages 1237-1245.
- Kop, R., & Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? *The International Review of Research in Open and Distributed Learning*, 9(3). doi:10.19173/irrodl.v9i3.523

- Ku, P., Lin, Y. & Tsai, Y. (2012). Social-Media-Assisted Learning: A Case Study of Teaching Computer Science on Facebook. *International Journal of e-Education, e-Business, e-Management and e-Learning*, Vol. 2, No. 3, June 2012
- Lampe, C., Wohn, D., Vitak, J., Ellison, N. & Wash, R. (2011). Student use of Facebook for organizing collaborative classroom activities. *Computer-Supported Collaborative Learning* (2011) 6:329–347. DOI 10.1007/s11412-011-9115-y
- Lenhart, A. (2015). Teens, Social Media & Technology Overview. *Pew Research Center*. Retrieved from <http://www.pewinternet.org/2015/04/09/teens-social-media-technology-2015/>
- Mayende, G., Muyinda, P., Isabwe, G., Walimbwa, M. & Siminyu, S. (2014). Facebook Mediated Interaction And Learning In Distance Learning At Makerere University. *International Conference e-Learning 2014*. ISBN: 978-989-8704-08-5
- Mazer, J., Murphy, R. & Simonds, C. (2007). I'll See You On "Facebook": The Effects of Computer-Mediated Teacher Self-Disclosure on Student Motivation, Affective Learning, and Classroom Climate. *Communication Education*, 56:1, 1-17, DOI:10.1080/03634520601009710.
- Mbodila, M., Ndebele, C. & Muhandji, K. (2014). The Effect of Social Media on Student's Engagement and Collaboration in Higher Education: A Case Study of the Use of Facebook at a South African University. *J Communication*, 5(2): 115-125.
- Nadkarni, A. & Hofmann, S. (2012). Why Do People Use Facebook? . *Personality and Individual Differences*. Volume 52, Issue 3, Pages 241-464
- Ng'ambi, D. (2013), Effective and ineffective uses of emerging technologies: Towards a transformative pedagogical model. *Br J Educ Technol*, 44: 652–661. doi:10.1111/bjet.12053
- Ogedebe, P., Emmanuel, J. & Musa, Y. (2012). A survey on Facebook and Academic Performance in Nigeria Universities. *International Journal of Engineering Research and Applications (IJERA)*, ISSN: 2248-9622, Vol. 2, Issue 4, July-August 2012, pp.788-797.
- Pimmer, C, Linxen, S. & Gröbriel, U. (2012). Facebook as a learning tool? A case study on the appropriation of social network sites from mobile phone in developing countries. *British Journal of Educational Technology* · September 2012. DOI: 10.1111/j.1467-8535.2012.01351
- Santos, I., Hammond, M., Durli, Z. and Chou, S. (2009). Is There a Role for Social Networking Sites in Education?. *Conference Paper* · January 2009. DOI: 10.1007/978-3-642-03115-1_34 · Source: DBLP

- Sarsar, F. & Harmon, S. (2011). Facebook as an Online Learning Environment: Perceptions of Undergraduate Students. In M. Koehler & P. Mishra (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2011* (pp. 715-720).
- Singh, A. (2013). Potential of Facebook in Teacher Education: A Comparative Study of Student Teachers and Teacher Educators. *International Journal of Information and Computation Technology*. ISSN 0974-2239 Volume 3, Number 3 (2013), pp. 111-118
- Stanley, N. (2017). Facebook – The classroom of the 21st century. *Education Technology Solutions, ETSMAGAZINE* on April 20, 2017 at 8:45 am. Retrieved from <https://www.educationtechnologysolutions.com.au/2017/04/facebook-classroom-21st-century/>
- Thuseethan, S., & Kuhanesan, S. (n.d.). Influence of Facebook in Academic Performance of Sri Lankan University Students. *SSRN Electronic Journal*. doi:10.2139/ssrn.2478336
- Vygotsky, S. (1978). *Mind in Society: The development of higher psychological process*. Cambridge, MA: Harvard University Press, London. Retrieved from <http://home.fau.edu/musgrove/web/vygotsky1978.pdf>