Student use of Facebook for Informal Learning and Peer Support

Elaine Garcia¹, Ibrahim Elbeltagi¹ and Kerry Dungay²
¹Plymouth University, Plymouth, UK
²University of St Mark and St John, Plymouth, UK
elaine.garcia@plymouth.ac.uk
i.elbeltagi@plymouth.ac.uk
kerrydungay@gmail.com

Abstract: As the use of Social Networking and Social Media Technologies (SNT) has become pandemic amongst young people (Tess, 2013; Falahah & Rosmala, 2012) there has been an increasing drive amongst educators and researchers to explore the ways in which SNT may be utilized within the classroom (Junco, 2012). Whilst there is therefore an increasing amount of literature available in relation to the use of SNT within the classroom it does not appear that there has been sufficient research considering the manner in which SNT results in the development of a complex, invisible and organic social network amongst students. When these networks exist outside of the classroom they may allow informal learning and peer support to occur. This paper utilises an empirical approach to explore the nature of these invisible networks and the degree to which the use of SNT by students outside of the classroom may provide support for student learning in relation to informal learning and social interaction. Additionally, this paper seeks to determine if the use of Facebook by students may provide an indication of the likelihood of student success on their course. This study explores the use of Facebook through the use of a case study of one cohort (90 students) who are undertaking a one-year Foundation in Art and Design course within a specialist art college. This research utilises the technique of Social Network Analysis (SNA) in order to visualise the type of interactions that occur within the online network and the strength of these interactions (Dawson, 2008). Results demonstrate that within this case study the student group created a complex and interrelated network of connections through Facebook with some students clearly placed at the centre of the network and others on the periphery. It is also demonstrated that those students who are more central within the network are more likely to remain on the course and achieve their qualification. This paper demonstrates that SNA provides a useful and insightful way in which to visualise what would otherwise be an invisible network of connections made by students outside of the classroom. Furthermore, this paper will provide an insight for teachers and researchers into the benefits of the use of SNT within education, which will have practical implications for the future use of SNT in teaching and learning.

Keywords: social media, case study, Facebook, teaching, learning

1. Introduction

The rise of Social Networking and Social Media Technologies (SNT) has resulted in reports that such technologies are now more important than ever before within our daily lives (OFCOM, 2014). The largest and most popular SNT is undoubtedly Facebook, which is reportedly utilised by 36 million unique British adult visitors per month who spend an average of 14.7 billion minutes using the site (OFCOM, 2014). Duggan et al (2014) reports that Facebook is particularly popular amongst young adults with 87% regularly using Facebook. It may therefore be assumed that Facebook is an important aspect of the majority of students' daily lives (Deng & Tavares, 2013; Tess, 2013; Falahah & Rosmala, 2012; Madge et al, 2009).

Given the rise in popularity and widespread use of SNT amongst young people it is not surprising that an increasing number of educators are becoming enthusiastic about the potential use of SNT for teaching and learning (Selwyn, 2009). However whilst educators may be enthusiastic it is far from clear whether students wish for the use of SNT such as Facebook to be brought into the classroom.

This may therefore highlight the fact that educators do not understand the manner in which students are currently using SNT. As such we also do not as yet have a clear understanding of the complex, invisible and organic social networks, which are formed outside of the classroom through SNT (Junco, 2012) but which may include informal use for educational purposes. It is clear therefore that before formal educational use of SNT such as Facebook is considered it will be necessary to have a greater understanding of the manner in which students are using such tools and to explore the existing educational value and implications of their use in relation to retention and success (Amador & Amador, 2014) for those students who are existing Facebook users.

This paper will consider the existing literature in relation to student use of SNT before undertaking an analysis using Social Network Analysis (SNA) to establish the degree to which students are already using SNT.
2. Literature review

It is reported that young adults are spending increasing amounts of their time online (Duggan et al, 2014) and one of the most popular online activities appears to be the use of SNT. Social networking sites are reported to be embedding students in complex and rich webs of interactions and social relationships (Borgatti et al, 2009). In fact Facebook is now believed to be so popular amongst students that it is considered to be an integral part of University social life (Deng & Tavares, 2013). However this view is not shared universally as there are undoubtedly young people who do not wish to use such technologies, for various reasons (Falahah & Rosmala, 2012). It is also important to note that students do not use Facebook in a homogenous way and usage can be varied (Bosch, 2009). In fact it has been suggested that those who do not wish to use such sites could feel excluded and possibly ostracised (Bloxham, 2010) from others within their communities due to the rise in the use of such technologies. Furthermore it is important to note that where students feel forced to participate in such sites feelings of anxiety, resistance and resentment can be felt (Deng & Tavares, 2013).

In terms of the effect on education of the general use of such sites there appear to be contradictory reports. Some commentators claim that young people using SNT find it harder to communicate in class, tend to be more distracted and have shorter attention spans than non-users (Bloxham, 2010). Additionally it is reported that the time students spend on Facebook and the frequency with which they use Facebook are negatively associated with engagement in educational activities (Junco, 2012). Furthermore for some educators Facebook is considered to be a distraction which poorly impacts on student academic performance and study time (Irwin et al, 2012). Other commentators however have suggested that the use of SNT by students can result in better learning performance (Deng & Tavares, 2013).

Research considering the effect of the use of Facebook on education is becoming increasingly popular and there appears to be increasing academic interest in the effect of SNT on student educational performance (Junco, 2012). Research to date has however reported limited and mixed results. For example, studies that consider the direct relationship between grades and the use of Facebook appears to suggest there is either no relation between the factors (Pasek et al, 2009; Kolek & Saunders, 2008) or that those students who use Facebook have a lower overall grade (Kirschner & Karpinski, 2010; Junco, 2012; Bloxham, 2010). The majority of these studies however use self-reported measures for both the measurement of grade and use of Facebook and results may therefore not be entirely reliable.

Whilst such results may discourage the use of Facebook amongst students it is important to note that the majority of studies undertaken to date have reported on non-educationally focused use of Facebook amongst students. In these cases the use of Facebook was more likely to related to social purposes rather than educational activities (Hewitt & Forte, 2006). The use of Facebook for social purposes will not be expected to raise grades and is more likely to relate to the development of student social skills. Whilst social skills may not be directly linked to education and learning it something which can be considered to be an important factor for student success (Junco, 2015). It is therefore the manner in which Facebook allows students to create meaningful online relationships and mature forms of communication that is of use and is resulting in Facebook becoming an integral part of student daily life (Madge et al, 2009). It is also important to note that another benefit of the use of Facebook by students is the manner in which online interactions are closely aligned to the concept of social capital. It is interesting to note also that the manner in which students use Facebook changes as they progress through their academic life. During the first stages of University it would appear that students use Facebook to build and maintain new friendships at a new Institution and connect with a new peer group (Junco 2015). Facebook during the initial stages of University is therefore considered by some studies to be the “social glue” that enables students to settle into University life (Madge et al, 2009). The use of Facebook in later periods of study is considered to be more related to the interactions that occur between students as they face common problems related to negotiating their learning (Selwyn, 2009).

Whilst this appears to suggest Facebook allows new social interactions to occur it is important to note that activities mainly consist of the reinforcement of existing offline relationships rather than creating new relationships online (Munoz & Towner, 2011). These activities are closely aligned to the concept of social capital.
Engagement in Facebook has been found to closely relate to an increase in student social capital and especially so for those students that were low in life satisfaction or self esteem (Ellison, Steinfield & Lampe, 2007).

Social capital is broadly defined as resources, which individuals accumulate through the relationships they have with other people (Ellison, Steinfield & Lampe, 2007). Facebook is considered to be an online social space in which students are able to build and maintain social capital with others (Cheung, Chui & Lee, 2011) in two ways, firstly bridging social capital and secondly bonding social capital. Bridging social capital consists of a number of “weak ties” and as such supports the loose social ties that individuals have and allows users to maintain and create large, relatively diffuse networks from which a wide range of resources may be drawn (Ellison, Steinfield & Lampe, 2007). The concept of “weak ties” is most often attributed to Granovetter (1983) who considered that a weak tie between an individual and an acquaintance should be viewed as an important bridge between two densely knitted circles of close friends.

Bonding social capital meanwhile reflects the relationships individuals have with family and very close friends who represent “stronger ties” with an individual and consists of individuals who will be in a position to provide emotional support and access to less easy to find resources (Ellison, Steinfield & Lampe, 2007). Whilst strong ties therefore provide greater support to an individual it is the weak ties which allow an individual to receive a wider degree of information without which they would be confined to more provincial news and the views of family and close friends only (Granovetter, 1983).

Social capital is considered to be one of the positive effects of the use of Facebook by students, particularly for those individuals who may have difficulties in forming offline relationships (Ellison, Steinfield & Lampe, 2007). Facebook also is considered to lower barriers to interaction and encourage self-disclosure, which allow individuals to create and maintain large and diffuse networks of relationships relatively cheaply and easily (Ellison, Steinfield & Lampe, 2007). Facebook can therefore be considered to allow individuals to develop diffuse and extensive networks. It is necessary however to consider, in relation to education and students, whether such benefits could be extended from the personal into the academic realm (Bosch, 2009).

Whilst the use of Facebook for social purposes may not represent a formal form of teaching and learning it has been reported that the use of Facebook and resulting discussions that may occur amongst students will result in informal learning occurring (Madge et al, 2009). The indirect result of this informal learning will result in the creation of an informal learning community (Munoz & Towner, 2011) or knowledge community (Selwyn, 2009). Facebook can in fact be argued to represent a continuation of the informal discourse that have been a long term feature of student life within the Higher Education sector (Selwyn, 2009). It has been argued that Facebook can offer a platform from which students can adopt self-governed, problem-based and collaborative learning processes (Irwin et al, 2012). There does not however appear to be amongst researchers or academics a clear understanding of how students may develop these self-organised online communities and use such technologies to support self directed learning that occurs beyond the classroom (Deng & Tavares, 2013).

Further benefits of Facebook use by students are considered to include: Students can gain support, information and ideas from others with whom they have a social relationship (Maghrabi, Oakley & Nemati, 2014); Students are able to use Facebook to contact classmates to ask questions about class activities (Munoz & Towner, 2011); Students are able to collaborate on assignments and projects online (Munoz & Towner, 2011); Students can connect with each other during holiday periods, share lecture notes or study notes, answer questions about the practical aspects of their University life and share learning materials they have found via the internet (Bosch, 2009). It is argued that activities such as these allow the construction of student engagement, which leads ultimately to academic gains (Junco 2012). In this way Facebook becomes more than solely a social network but additionally becomes an informal educational network for students (Madge et al, 2009).

The manner in which Facebook is being used and is reportedly of value to students has resulted in calls for the existing use of Facebook to be allowed to continue unabated, away from the formal education setting and to remain backstage (Selwyn, 2009). This view is supported even though some studies have reported that students would be willing to see Facebook incorporated into their academic lives (Irwin et al, 2012).

Overall there appears to be considerable debate concerning whether students wish to use Facebook for academic purposes. Whether students are willing to use Facebook for academic purposes or not, it is clear that students today mainly use Facebook for social connectivity (Irwin et al, 2012). Jong et al (2014) for example...
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reports that whilst 81% of students state that they have experience of discussing educationally related issues on Facebook only 59% of students explicitly state that peer discussion of educationally related issue is a motive for using Facebook. There are also conflicting results in relation to whether students would wish to use Facebook for academic use. For example Hewitt & Forte (2006) report that 66% of students would consider the presence of tutors within Facebook would be acceptable. However Duggan et al (2014) report that 73% of students agreed or strongly agreed that they wished to keep their social and academic lives separate. Bosch (2009) meanwhile reports that students would prefer to conduct discussions via Facebook as opposed to institutional virtual learning environments due to reasons such as existing familiarity and user experience with Facebook. Overall it would appear that there is consensus that Facebook is generally considered to be most useful to students for firstly social purposes and secondly informal learning and it is not proven to be useful for formal learning (Madge et al, 2009).

The use of Facebook for formal learning is however something to which increasing attention is being given (Curtis, 2014; Sheninger, 2012; Pollara & Zhu, 2011). It would appear that a number of educators consider that, if used in an appropriate manner, SNT can have benefits which would be useful in an educational context. Key motivations for using Facebook within formal education included to “meet” students within their own space and additionally to utilise a site, which is already popular with students to provide students with learning materials (Bosch, 2009). SNT could for example benefit students by providing additional opportunities for them to enter new networks of collaborative learning (Selwyn, 2009), particularly collaborative student-led learning (Bosch, 2009) and to support collaboration and cooperative learning (Irwin et al, 2012) through the strengthening of weak ties and increased social bonding capital and bridging capital as discussed above.

Overall it would appear that whilst there has been interest in the use of Facebook as a formal educational tool, empirical research is largely still in its infancy and findings are at present inconclusive (Deng & Tavares, 2013; Falahah & Rosmala, 2012). In order to better comprehend the manner in which students are currently engaging with Facebook and the facilitating and debilitating factors that may affect the way in which Facebook is used by students (Deng & Tavares, 2013) a case study of a course group will be analysed using Social Network Analysis (SNA).

3. Methodology

This research is undertaken utilising Social Network Analysis (SNA) in order to predict the structure of the relationships that exist between social entities and the impact these relationships have on other social phenomena (Butts, 2008). This research also however utilises a case study approach due to the manner in which the collection of research data has been conducted within a natural setting and seeks to gain an understanding of participants and relationships that exist between participants (Saunders, Lewis & Thornhill, 2012).

3.1 Case study method

A case study approach is a qualitative research method, which allows the researcher to explore phenomena (Saunders, Lewis & Thornhill, 2012). Case studies are useful methodologies for occasions when a researcher wishes to gain an understanding of the context in which the phenomena is occurring. (Saunders, Lewis & Thornhill, 2012) One of the key advantages of a case study is the manner in which it can deal with a variety of evidence (Saunders, Lewis & Thornhill, 2012). By using a variety of evidence a more detailed view of the phenomena can be considered. (Yin, 2003)

3.2 Social Network Analysis (SNA)

SNA allows a real life social network, which consists of individuals connected to each other to be visualised by a mathematical object called a graph (Carrington, 2014). Within this graph individuals are represented as points on the graph known as “nodes” whilst the relationships between nodes are shown as lines known as “edges” (Carrington, 2014).

SNA provides an approach through which the overt interactions that occur, the strength of these interactions and the types of resources exchanged can be examined in order to better understand the formation and structure of such communities (Dawson, 2008). SNA is considered to be useful as it allows researchers to view the “totality” of the social network and the context in which nodes interact and therefore the “embeddeness” of social action (Hollstein, 2014).
3.3 Data collection

In order to capture the information required a list of all student names was obtained on a specific course group. This list was used to create a matrix of all students and the possible connections they could have with other students within the group. Each student’s name was then manually checked within Facebook and all connections were noted on the matrix. If student’s privacy settings prevented them, or their friends list, being visible publicly they were excluded from the analysis. In total 86 out of 90 students were found to have accessible Facebook profiles. It is important to state that only information that was publicly available within Facebook was utilised for this analysis and all students were over 18 years of age.

In addition to student names researchers were also able to capture additional information about student’s attendance, gender, age and current status on the course from the College’s Management Information department. Furthermore the Course Leader was able to provide details relating to student final grades and final pathway.

4. The case study

In order to undertake this research an art and design Foundation Diploma (level 3) Further Education course within a UK specialist art college was selected. This course was selected firstly due to the relatively large number of students within the course (90 students) and additionally as it was a one year course which was completing in the academic year 2013/2014. This course is located within a single building five minutes away from the College’s main campus and the space is shared by no other groups or students. The majority of students join the course following A-levels, which are completed at other institutions within the city. Within this course no use of Facebook or SNT was included as part of the formal learning programme.

5. Results

5.1 General features of the network

SNA has demonstrated an average degree of centrality within this network of 11.129. The majority of students had a degree of centrality between 11 and 20. When displayed within a visual form using the Fruchterman Reingold algorithm (Figure1) it becomes clear that the network is fairly well connected with even students on the periphery of the network having a number of connections. There are however a small number of students who sit on the periphery of the network who only have one or two connections. Within Figure 1 nodes with a high degree of centrality are coloured black with those with lower levels of centrality coloured white. Those with a middle level of centrality are coloured grey.

![Figure 1: Gephi visualisation of the degree of centrality within the network](image)

Within this network the average path length equals 1.8. This indicates that within this network any node is typically less than 2 degrees away from any other node. As the diameter of the network equals 5 this indicates that no node is more than 5 degrees away from any other within the network.

A further aspect of the network, which it is interesting to consider, is the manner in which the network displays clustering. Figure 2 displays the clusters that exist within the network. This analysis has been undertaken using a degree cut off of 2 and the KM Clustering algorithm. In this case each cluster is represented by a different colour.
From the clustering analysis it is indicated that there are five clusters within this network. The largest cluster is comprised of 29 students, the second cluster is comprised of 15 students, the third is comprised of 13 students and the fourth and fifth clusters are comprised of 3 students each. This therefore indicates that within the network there are a number of distinct groups of nodes who have similar features to each other. This therefore demonstrates that the network is not homogenous.

As the degree of centrality and clustering of the network have now been determined it is possible to overlay a number of factors onto the visualisations created in order to determine if any factors appear to be related to the degree of centrality of the nodes. The first factor that will be considered is the total number of Facebook friends each node has.

5.2 Specific features of the network

Figure 3 provides a visualisation of the degree of centrality of the network as seen previously but in this case it is ranked by the total number of Facebook friends each node has with those nodes who have more total Facebook friends coloured darker and those with lower number coloured lighter.

In terms of total number of Facebook friends it would not appear that there is a significant differentiation between the centrality of those students who have a large number of Facebook friends and those that have lower numbers of total Facebook friends. This would therefore suggest that students are not more likely to be more densely located within the network if they are more active generally within Facebook.

The next area to be considered is the manner in which attendance may influence the centrality of the network. Figure 4 represents the network visualisation of degree of centrality with attendance overlaid onto the network. In this case those with higher levels of attendance are coloured darker whilst those with lower levels are coloured lighter.

In this case it would appear that there is some relation between level of attendance and location within the network. In Figure 4 it appears that those students with lower attendance are more likely to be located on the periphery of the network rather than centrally. It is not possible to view however from this analysis whether attendance is a predictor of location within the network or whether those students who are less central within the social network of the group is less likely to attend face to face sessions.
The next area to be considered within this analysis is the final grade achieved by the student. Figure 5 displays the degree of centrality network, highlighted by the grade achieved by each student. Those who have achieved lower grades are coloured lightly with those who achieved higher grades coloured more darkly.

In this case it would appear that there is some relation between the centrality of the network and improved performance on the course although this relationship is not very clearly displayed and is shown to be stronger through the data metrics within Gephi. Once again it is not possible to determine whether those students who are more central and socially linked to others within the course are more likely to achieve better grades or whether those with better grades are more likely to be more socially active but this visualisation does demonstrate that a relationship between these factors exists.

The final area, which will be considered within this analysis, is the visualisation of the centrality of the network and those who failed to complete the course. Figure 6 displays those who left the course early as dark nodes and those who remained on the course as light nodes.

In Figure 6 it is clear that those who left the course early are on the periphery of the network although once again it is not clear whether the position of the nodes is due to the fact that students left the course early or left the course early due to the lack of centrality within the network.

In relation to early leavers it is also interesting to note that a number of those who left the course early were either linked on the SNA with others that left the course or were linked with very few other students within the network. Three of the students that left the course early are for example only connected to one other person within the course. One of the students that left the course early was linked to three other students that also left the course early whilst another was connected to two other students that left the course early.
6. Discussion

From the results it is clear that students are using Facebook extensively and that there is complex, invisible and organic social network that is formed within Facebook amongst students on the Foundation Diploma course within this case.

Within the network it would appear that students are using Facebook in a range of ways as expected within the literature (Bosch, 2009) and there are students who are choosing to interact with Facebook in very limited ways or not at all, as well as those students who are very integrated within the social network.

It would appear from the results considering grades, attendance and early leavers that student use of Facebook does not have a detrimental effect on student performance within the course (Kirschner & Karpinski, 2010; Junco, 2012, Bloxham, 2010). In reality those students who are more central within the network are more likely to stay on the course, achieve well and attend.

The manner in which total number of Facebook friends does not appear to affect the degree of centrality suggests that students are not necessarily building large diffuse networks and therefore will not have very high levels of bridging and bonding capital (Granovetter, 1983; Ellison, Steinfield & Lampe, 2007). The average degree of centrality seen within this research would also suggest that students are not seeking to build connection with large numbers of students. Bridging social capital may however enable students to reach across the network relatively easily given the average network path length and the diameter of the network.

Within this case study it has been demonstrated that students are using Facebook to socialise with others on their course and therefore with others with whom they already have some form of offline relationship (Munoz & Towner, 2011). It is not clear however whether these interactions are for social or informal learning reasons. Within this course there was no formal use of SNT and specifically Facebook and therefore it is important to consider that value the use of Facebook outside of the classroom may have for students. This supports the view that existing use of Facebook should be allowed to continue unabated, away from the formal education setting (Selwyn, 2009).

7. Conclusions and recommendations

This research has provided a unique insight into student group use of Facebook as a social and informal learning tool. This research has shown that students are using SNT extensively and are using such technologies to connect with others within their course. This research has also shown a positive link between student centrality when using Facebook and a number of key student success factors such as summative grade and leaving the course early.

It is hoped that future research will utilise the methods employed within this study in order to further explore the results seen here and to further consider the manner in which SNT tools may be used to the maximum benefit of students in the future whether this is for social purpose, informal learning or formal learning.

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