

Online Social Networks in academia: A Review of Applications and Issues

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ABSTRACT

Our society is becoming technology dependent and this is particular true for people in academia. Online Social Network (OSN) is a method to connect students with their teachers within the academic environment. This paper reviews the usage of OSNs, education in other domains, the association between OSNs and learning style as well as its effects in higher education. The review emphasises that OSNs play a vital role in enhancing the effectiveness of teaching and learning process in academia. However, without proper training programs and awareness against OSNs consequences, negative outcomes such as security and privacy issues will occur in academic institutions' IT systems. This affects students and instructors' personal

Keywords: Online Social Networks (OSN), Learning style, Academic performance, Applications, Security, Privacy issues.

1. INTRODUCTION

The use of OSN websites is growing especially for academic purposes [1]. OSNs such as Facebook, MySpace and Twitter opens up an enormous opportunity for educational researchers to understand students' learning style, their development as well as improving academic performance [2]. Not only, can an OSN be considered as another medium that universities can use to offer support, but also a place for students to interact with university staff as well as contain information on university resources and culture [3].

The Web 2.0 bandwagon with its improved functionality is the reason OSNs have become popular. Web 2.0 refers to new interoperable, interlocking type of services, where websites would provide components rather than finite, one-stop experiences, to encourage users to interact. Users in this paradigm would be, therefore, free to combine online services in any way they prefer [4]. OSNs refer to a group of Internet-based applications that build on the ideological and technological foundation of Web 2.0. OSNs allow interaction between people to share ideas, audio, videos, and exchange information [5]. OSNs have been considered as a social

technology rather than a formal teaching tool [6] and contribute to higher education to improve student's learning style as well as provide various purposes and potential benefits. It can be considered as a learning tool to provide a dynamic virtual world between students and instructors [7].

It can be also used to enhance the communication and to share information between students and instructors by accessing various contents and information from anywhere at any time [8]. Therefore, educational institutions can easily reach conceptive students according to their interests and availability online. Availability of OSNs can motivate students to share their ideas and thoughts. They can discuss technical issues inside or outside university. This has encouraged universities to further explore the use and effectiveness of OSN as a teaching tool. However, this could increase the chance of accessing personal and private data that includes student identifiers. This can lead to identity misuse and could be the primary reason for targeting academic institutions by attackers [9].

This study was motivated to provide a comprehensive overview of the usage of OSN in the context of learning style and their effects in higher education institutions. In addition to this, identifying areas that need further research in the academic sector to improve the awareness against the use of OSN in academia, in an attempt to reduce the damage that could be incurred now and in the future from cyberattacks. Our research is based on answering the following questions:

- What is the role that OSNs can play in learning style for students and how does this affect academic staff?
- What effects do OSNs have in regards to education in other domains?
- What are the issues in sharing different types of contents and private information on OSNs?
- What are the criteria needed to increase the awareness level and qualify trustworthy in academic sector?

The remainder of the paper is structured as follows: Section 2 provides literature review for OSNs which covers areas such as OSN usage, the application of OSNs in different domains as well as the issue of information disclosure. The discussion of the paper is provided in Section 3 and the paper is concluded in Section 4.

2. LITERATURE REVIEW

2.1 OSN USAGE AND LEARNING STYLES

The usage of the OSN has changed the way people live and work and it has become a necessary need in our daily life including entertainment, professional networking and to communicate with those close to us. This plays a vital role in increasing the risk of theft, fraud and abuse of personal data. On the other hand, there is no country, industry or even individual that is safe from cyber security incidents risks and its negative consequences. In the light of this, security awareness is particularly important for sensitive information that must be protected at all times from cyber-attacks.

The security of information systems is becoming a leading priority, where the number of cyber security incidents rapidly rises and became more and more effective and aggressive than before. According to a report in 2013, by the Kaspersky Lab, about 91% of the organizations surveys reported that their IT Infrastructure had been the target of at least one external attack in the past 12 months. They also reported that malware, spam, phishing, network intrusion and the theft of mobile devices increased significantly compared to 2012 for these five

threats. For that, each organization using information systems must take information security seriously as a top priority. Awareness against OSNs consequences has not to be ignored and it is important to all information security aspects.

There are hundreds of millions of users use OSNs. They are available, free, are engaging and are fun to use. This makes them appropriate to be utilized for teaching and learning, particularly towards enhancing social interactions [10, 11]. A number of researchers have examined the relationship between the learning style and the usage of OSNs. This can help instructors and students to effectively communicate and enhance the teaching and learning process in the academic sector [12, 13, 14, 15]. OSNs could also be utilized to upgrade the general knowledge of students and instructors. They can exploit the learning functions provided by OSNs, which can provide and facilitate gathering information in any place and anytime. It empowers students to take classes whenever it seems best. The students also have complete freedom of area and time. Since they can access the data online, they can refer to the important information fast, which enhances their effectiveness, motivation and interaction in the learning process. The integration of OSNs and the online environment can be beneficial for the students for learning purposes and the student learning style will be enhanced [15, 16]. Much research has been conducted in this area, most of which shows that the use of OSNs can have a positive impact on the learning environment. With the technology, universities and educators can spread the information online and students can access it more easily. Hamid et al. [12] explored the use of social technologies for supporting the interactions between students and their instructors across two universities in Malaysia and Australia. The results revealed that students identified a number of positive results from using OSNs to enhance their interaction among themselves and with their instructors, and OSNs would be useful in providing richer insights when they use it for educational aims. In another study, [14] measured the impact of OSNs usage compared with the usage of traditional learning management system (LMS). They looked into how individuals interact and learn within OSNs using a theoretical model of student learning, course community and social interaction before and after the intervention. The results showed that students experienced higher levels of perceived social interaction and the course community had higher levels of satisfaction with OSNs when compared to using LMS. The results also confirmed that OSNs yielded a higher number of interactions, providing a more engaging learning experience.

2.2 OSNS IN DIFFERENT DOMAINS

Much research has been conducted to study the impact of OSNs in various domains [17, 18, 19, 20, 21]. The authors in [19] Investigated if online writing affects students writing anxiety and to access overall students' attitudes towards the use of Facebook in the academic domain using quantitative study and based on Vygotsky's learning theory and Technological Pedagogical Content Knowledge (TPACK) model. The findings showed that there is a positive association between writing online via the use of Facebook and reducing anxiety levels and those educators also should embrace the use of OSNs in classrooms.

The authors in [18] studied the impact relationship between OSNs and consumer brand using a quantitative method to test the hypothesized relationships. The findings showed that a general support for the positive effect of Brand's Social Network (BSN) benefits on outcome variables. The study also concluded that BSN positively influence consumer's perception of relationship investment made by the

brand, resulting in both brand relationship quality and the willingness to spread good words about the BSN. In [20], the authors investigated whether nurses used social media as effective educational tools to support their study using Facebook and the findings revealed that OSNs have the potential to enhance students' self-efficacy in learning and can deeply support and develop their learning. On the other hand, research conducted by [22] used a series of univariate ANOVAs and regressions to investigate how different aged individuals use Facebook. The findings showed that there are significant differences in using of OSNs between older adults' and younger generation. In addition, there is a need for further investigation into the effects of OSNs on individuals of different age groups. Game-based learning (GBL) refers to the use of computer games that possess educational value or different kind of software applications that use games for learning, training and education purposes. It is widely used in different domains including military, education, marketing and advertising. Despite its admiration, an assessment of OSNs and its efficiency as a learning tool is still vague. A conceptual analysis framework is proposed by [23] in an attempt to evaluate the effectiveness of using GBL in academic domain and the findings showed that the learner's background influenced learner's motivation to learn, and therefore, affected their performance. The authors in [24] examined the association between OSNs parameters and student outcomes. They suggested that the researchers should further investigate, whether there are conditions under which social network parameters are reliable predictors of academic performance. They also advise against relying completely on social network parameters for predictive purposes. On the other hand, [26] presented a novel cloud-computing-based service, which relies on advanced artificial intelligence technique to infer knowledge and interest from users in different OSNs. This way enables the authors to have a better way to look at a certain degree of the user's knowledge level on different topics. Limongelli et al., [25] defined a model, which aims to give teachers a personalized support, encompassing consideration for their own teaching styles, and teaching experience issues during course construction. It is vitally important to consider all of these issues in a dynamic way towards the best moral choices for the instructors and subsequently improve their students' performance.

2.3 INFORMATION DISCLOSURE

The number of OSNs users has dramatically increased in recent years and these technologies became increasingly necessary in our daily life activities. For example, hundreds of millions of users post terabytes of data on several OSNs websites every day [27]. OSNs services allow their users to share different types of private contents and information such as, photos, videos, age and gender, contacts and interests. In addition to this, they can play a vital role in maintaining friend relationships and finding support and information. Information disclosure refers to which one allow access to aspects of one's private information, in the case of unauthorized access or use in unethical manner to this private information without user's consent could lead to negative consequences such as privacy violation and identity theft [28]. For this, more attention should be given to privacy issues in OSNs including who would have the right to access these private information and profiles and how the profile data would be retrieved, stored, controlled and distributed. A worldwide range of studies has focused on the importance of private information disclosure on OSNs. In [29], the authors investigated the impact privacy concerns among college students for both men and women. The findings show that men have higher percentage of women to

privacy concern and information disclosure. This also confirmed by the study conducted [30]. The authors in [31] examined the several factors associated with the probability of increased concerns over privacy in 26 Europe countries, their findings show that the cultural and socio-demographic are the main factors that can affect the level of privacy concerns. In another study conducted by [32] showed that there is an urgent need for privacy on OSNs and it is one of the most crucial issues in both industries and academic sector. They investigated the effects of several factors such as user's demographics, personal social network size, blogging productivity and social network site experience on privacy disclosure. Their findings showed that social network site experience and personal social network size are not significantly related to user's privacy disclosure and blog number has positive relations with privacy disclosure patterns.

2.4 THE EFFECTS OF OSN USAGE

Despite the fact OSNs bring benefits to many people and organizations. For instance, educational institutions can use OSNs to provide their students with different information; examples include, the university news, activities, emails, courses; academic year calendar, academic staff, student's marks and other personal information stored on their computer systems. Therefore, these systems need to be protected against a number of threats such as spyware, cross-site scripting (XSS), viruses, worms, Trojan horse, phishing, Denial-of-Service (DoS), and Distributed Denial-of-Service [33]. It could be used by an adversary not only to effect on the organization's assets by stealing their sensitive information, but also could effect on the organization's financial side. Therefore, every organization using information systems must take information security seriously.

Many studies have shown that the use of OSNs could have an adverse effect on certain locations. For example, spending long time on using OSN at improper times inside the classroom or while studying time has a significant effect on academic performance and may lead to other problems, such as emotional stress, damaged relationships and attention deficit disorder. Another negative consequence is a phenomenon [34]. This phenomenon indicates how people keep thinking and checking their OSN websites even when they do not need to use it.

Another concern for students is cyber bullying. It is the act of bullying a person using electronic communication tools by sending threatening messages such as, viruses or malware to hurt a person through social media websites, chat and emails [35]. A survey of 430 students from Greek universities by [36], they found that more than half (58.4%) of the respondents had participated in cyber bullying and it is becoming more common.

There are also many studies have investigated the relationship between the usage, multitasking of OSNs and students' Grade Point Average (GPA) [37, 33, 38, 39, 38, 40]. The findings showed that the students who spend fewer hours per week in studying achieve lower GPA than others. This is also confirmed by the study conducted by [40]. Similarly, the authors in [39] conducted a survey of university students in Saudi Arabia in an attempt to investigate not only the relationship between the usage of social media and their academic performance but also to specify the most popular social media preferred by the students. The results, however, demonstrated that the relationship between social media usage and GPA score does not exist. Students highlighted that besides social media use; time management is a factor, which affects their studies negatively.

On the other hand, [38] investigated multitasking with technologies on the relationship between the use of OSNs and students GPA. The study showed, decreasing in both the efficacy and productivity in academic setting and their GPA. This is also confirmed by [41]. In [42] the authors investigated the relationship between Facebook activities, use, time spent on preparing classes and GPA. The findings show that a strong negative association between times spent on Facebook and the overall GPA and a weak relationship between times spent on using Facebook and preparing of class material. Other studies have focused on the effects of OSNs on personality [43, 48, 44, 45]. The primary goal of the study by [46] was to investigate the effects of OSNs usage, specifically Facebook on the users and their behavior. The findings revealed that the educational use of Facebook is explained directly by its purposes of usage and indirectly by its adoption. There is a relationship between both personality behavior and Facebook usage. [44] confirm that there is a strong relationship between Facebook user's photo-related activities and personality traits. In another study conducted by [45], the results disclosed that shyness, motivation and self-efficiency attitudes and sociability have positively related to OSNs use. In a study reported by [47], it was found that OSNs could be used as a support tool for users in their Decision Making (DM) process specifically in three phases including intelligence, design and choice. First intelligence is to collect information about a problem and identifies its consequences. Second is to understand the problem from different sides. In the last phase is the attempt to find out alternatives that can lead to the best decision option. The results also revealed that various types of users have meaningfully different participation styles, which in turn have impact on the effectiveness of the DM process

3. DISCUSSION

OSN networks play a significant role in every aspect of our lives, both personal and public communication. People rely on OSNs to provide them with news, post information, share photos and other personal information. These technologies have also changed the way people live and interact. By adapting OSNs especially in the higher institutions, not only learning can happen whenever and at wherever but also it can enhance the student-student and student-instructor interactions.

Not only OSNs provide both students and teachers access to unlimited amounts of information to expand their learning and knowledge prospects, but also they play a role in increasing their dynamic educational experiences. OSNs can also be used as a channel for communication. They enable collaborative learning within students where a group of students is given a problem statement and each of them is expected to reach a consensus to submit a single answer or to write a new answer collectively.

However, the access to this unlimited information by different parties may pose to different types of risk and this information needs to be protected from intruders danger when it is transferred and it should remain safely stored and the only users who have the authority can regulate the collection and use that private information. For this, a high level of system security is required to protect users' records. Information Security Management System (ISMS) can play a vital role in improving and managing information security aspects, where its main goal is to identify approaches, strategic decisions, and methodologies to ensure that the data is kept safe from risks and threats. ISMS can also be a very useful tool to bridge the gap between management and technical people were both parties have to understand that security is not something that could be ignored and it is one of the most important

factors to achieve the desired goals in any organization. It is vitally recommended that academic institutions implement an ISMS in their environment to ensure that the data of students, academic staff, and employees are kept safe. Furthermore, by implementing ISO/IEC 27001: 2013 which represents one of the most widely used standards, academic institutions can ensure that the security of their private data are secured at all levels as well as improve the effectiveness of their information security. Aside from privacy concerns, awareness is also an important issue to be considered in OSNs. This is because some of end-users are ignorant of this type of technology and their consequences, and therefore, they are unable to make balanced judgments concerning the level to which it may have a negative impact on their own perceived standards of privacy. In order to address and mitigate this issue, First, cyber security awareness should undergo meticulous designing and formulation by the academic institution at the enterprise level of top management as the highest authority responsible for all kinds of security affecting its users, students, academic staff, and employees. These policies should then be carried through and executed at all level of management to ensure protection and compliance. Second, the awareness should start from academic staff to students by teaching about cyber incidents consequences and risks of OSNs within workshops, classrooms. Teachers should also educate what is new in this field and in this way we will ensure a clear picture of awareness level at the individual and institutional level. Third, is to encourage the active use of privacy services and facilities within OSN websites. Finally, it will also require actual and non-actual regulatory and standards bodies, governments, higher education to address the safety measures' issues to synthesize legislations, directives and guidelines for the use of OSNs in academic sectors as part of their comprehensive deployment strategy.

4. CONCLUSION

OSNs bring some benefits to people and have effect on academic performance, decision-making ability and personality. OSNs enable their users to share different types of private contents. This information needs to be away from risks, it is vitally important to focus on the security and privacy issues in OSN to protect these contents to be away from risks. This would also require awareness framework to meet the need for the other substantive safety measures to ensure compliance with the law and ethical behavior by students, instructors and academic institutions to safeguard their personal and information data now and in the future. OSNs technology has changed the traditional idea and way of learning, in that we are continually surrounded in learning encounters. In this period of advancement, we have a propensity to effortlessly adjust to the innovations and teaching methods that develop. Therefore, the combination of OSNs and learning may offer great advancement in the conveyance of teaching in the future. It can be concluded that OSNs can play a vital role in enhancing the effectiveness of teaching and learning process in academia. This study may assist to be as a database for different researchers who aim to examine the usage of OSNs and their issues in academia.

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