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Social Media: Computing Education Perspective in Diverse Educational Contexts

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ABSTRACT

The academic world has experienced rapid growth in the adoption of social media that can constructively complement traditional education and even replace it in distance/online learning. Social media is used in many institutions for educational purposes in numerous innovative ways, even to the extent of being utilized in traditional face-to-face classrooms. A wealth of academic research has been published related to social media in education. The purpose of this special issue is to highlight research studies of social media in computing education, with the aim to discuss research findings, share good practices and practical experiences, and address the challenges of using social media in computing education. The special issue focuses on how social media in computing education is being used to transform teaching and learning practices in various educational contexts and settings. Additionally, the special issue covers a wide range of aspects related to the use of social media in computing education, such as the adoption of social media in instructional activities, the applicability of different social media tools in computing education, pedagogical frameworks, theoretical approaches, managerial perspectives, and possible ethical issues. An overview of the special issue papers is presented, exemplifying the importance of social media from a computing education perspective in a diverse educational context.

Keywords: Social media, Computing education, Student learning, Pedagogy, Teaching framework

1. INTRODUCTION

With the entry into the mainstream culture and the integration of technology into the daily lives of millions of people around the world, it is an undeniable fact that there has been a rapid growth in the use of social media in recent years. Social media offers new ways of using, teaching, and learning with computers and mobile devices. The pervasive nature of social media and its applications in various fields within computing and higher education has inspired researchers to investigate them. The presence of social media is closely associated with the concept of Web 2.0, which illustrates the changing role of the user with the Web. Web 2.0 is a concept that was released by O'Reilly (2007) at a brainstorming conference. The Web 1.0 generation of users played a passive role, merely reading published content available to everyone. Presently, in comparison, the production and publication of online content are done by the user, who plays an active role in seizing the opportunity to produce knowledge in the Web 2.0 generation. Despite the different and merely circular definitions of the terms Web 1.0, Web 2.0, and Web 3.0, it appears that Web 2.0 is considered to be a complete entity as it provides the user with a wide range of free (open source) tools without the need to know any programming languages. According to O'Reilly (2007), Web 2.0 is the "architecture of participation" and sharing, transforming the Web into a platform for work.

Moreover, Bruns (2008, p. 22) suggests that "the World Wide Web has been radically transformed, shifting from an information repository to a more social environment where users are not only passive receivers or active harvesters of information but also creators of content." Therefore, this transformation of the Web offers new opportunities for collaborative learning (Coutinho, 2009). Interaction is one of the most important aspects affecting learners while using new technology, and active interactions among persons are vital elements of learning (Hrastinski, 2009). Some of the features which social media offers to users include the creation of an online page or profile and the construction and display of an online network of contacts, often called 'friends' (Hrastinski and Dennen, 2012; Junco, 2012; Paliktzoglou and Suhonen, 2014a, 2014b). In this way, users can communicate with their 'friends' or potential 'friends' outside their list of contacts by using their profiles (Paliktzoglou and Suhonen, 2014a, 2015). This communication can be done on a one-to-one basis (private chat) or publicly, such as comments posted for general viewing (Paliktzoglou and Suhonen, 2014a; Paliktzoglou, Stylianou, and Suhonen, 2015; Paliktzoglou and Suhonen, 2015; Oyelere, Paliktzoglou, and Suhonen, 2016). Increased communication in terms of ease, efficiency, effectiveness, quality, increased information exchange, and stronger associations with classmates and coursework are encouraged by social media in higher education (Tess, 2013). Social media is also beneficial for involving students in the learning process. This learning technique transcends all barriers, forming ties between students of all ages, geographical, cultural, and socioeconomic backgrounds.

Moreover, social media has established rules. The range of rules varies from the etiquette which governs commenting on other people's profiles to deciding whether a contact should be listed as a 'friend' (Hrastinski and Dennen, 2012; Junco, 2012; Paliktzoglou and Suhonen, 2014a; Paliktzoglou, Stylianou, and Suhonen, 2015; Paliktzoglou and Suhonen, 2015; Oyelere, Paliktzoglou, and Suhonen, 2016). According to Ozkan and McKenzie (2008), in a 21st-century approach to teaching, educators need to engage students with social networking. Moreover, social media fosters the adoption of new learning models based on the pervasive nature of Web 2.0 (Greenhow, Robelia, and Hughes, 2009). Furthermore, Suter, Alexander, and Kaplan (2005) argue that the emerged virtual spaces, grounded on Web-based technologies, include several socializing features as zones for information sharing, community formation, collaboration, and extension. The benefits of using social media for community building are twofold: a) immediacy and b) student control over the environment (Paul, Baker, and Cochran, 2012; Zachos, Paraskevopoulou-Kollia, and Anagnostopoulos, 2018). As JISC (2010) argued, social media should involve a sound evaluation system in the teaching-learning process. It is worth mentioning that universities should consider investing in social media dedicated to communities of education experts.

2. SOCIAL MEDIA: COMPUTING EDUCATION PERSPECTIVE

Nowadays, social learning involves several core social media technologies important in modern e-learning (Downes, 2005). This can be easily explained considering the nature of social media, where social interaction and collaborative work play an important role. In a socio-constructivist approach, learners collaboratively interact and learn together, identifying the relations between e-learning practices and social media concepts (Safran, Guetl, and Helic, 2007) which are vital in the knowledge creation process (Paavola, Lipponen, and Hakkarainen, 2004). As such, the emerging arena of social media technologies can overcome many of the drawbacks of the traditional learning model (Chatti, Jarke, and Frosch-Wilke, 2007; Mnkandla and Minnaar, 2017). Conole and Alevizou (2010) describe social learning as a new form of learning defined as learning with social media. They suggest that social learning implies:

- Inquiry-based and exploratory learning.
- New forms of communication and collaboration.
- New forms of creativity, collaborative creation, and production.

In pedagogy, eLearning 2.0 and social learning are terms that are considered synonymous. Social learning can be described as learning with peers through social interaction. Downes (2005) was the first to coin the term eLearning 2.0, which marked the shift from eLearning to eLearning 2.0 as Web 2.0 was introduced. He suggests that eLearning 2.0 entails: social (informal) learning integrated into formal learning; building a learning community that includes not only students and facilitators but also peers worldwide; ePortfolios and Personal Learning Environments built by students; and Learning Management Systems (LMS) that are enlarged with collaborative content and interactions on Web 2.0 platforms/applications such as blogs, wikis, RSS, and podcasts. Regarding higher education, the University 2.0 phenomenon is somehow connected with the adoption of social media into higher education institutions (Downes, 2005). In embracing

University 2.0, universities should consider social media as an engagement tool for student recruitment and branding and the propagation of research (Colvin, 2011). Faimon and Platt (2010) suggest that there are new roles that the new university should consider.

The use of social media is consistent with a constructivist approach to learning as it fosters relationships between students and educators who are working toward a common goal, and as a result, it connects the knowledge sharing process, a sense of belonging, and a deeper understanding of class content (Faimon and Platt, 2010; Hughes, 2010; JISC, 2010; Anderson, 2019; Manca, 2020). Moreover, the pervasive nature of social media provides opportunities to incorporate computers and mobile devices (Paliktzoglou and Suhonen, 2014b, 2015; Oyelere, Paliktzoglou, and Suhonen, 2016). Therefore, further research is needed to investigate the possible positive aspects and drawbacks of using social media, especially from the computing education perspective. Considering that social media use is evolving, it is of particular interest to explore the computing education students' perceptions of social media as a collaborative learning tool (Kumar and Nanda, 2019; Manca, 2020). The term computing education can be defined as the eco-system involving the relevant pedagogies and technology to deliver computer science education. In the literature, Passey (2017) mentions the pedagogy of computer science topics in computer science education.

Moreover, Agbo et al. (2020) state that computing education is teaching and learning computer science using pedagogical approaches and technology. Students' attraction and familiarity with technology, especially with social media, advocates that they would have a great interest in computer science courses and degrees (Paliktzoglou and Suhonen, 2014a; Paliktzoglou, Stylianou, and Suhonen, 2015). The literature highlighted that familiarity is why social media are used more often by students compared to other course technologies (Appel, 2012; Fewkes and McCabe, 2012; Manca, 2020). On the other hand, teachers' use of social media for teaching and learning is minimal (Sobaih et al., 2016). The increase in students' interest in social media furthers the importance of reinvesting in the trends in computer science education. Therefore, the use of social media in computing education entails further investigation.

Furthermore, there are several aspects of computing education that lend themselves well to social learning. Many learning activities, especially those of a collaborative nature, are completed and delivered using computing technology. As such, computing education can enhance the student learning experience and, due to its nature, may easily incorporate social media and the appropriate pedagogies in courses and learning curriculum.

The literature reveals the common benefits connected with social media usage in higher education for learning in computing disciplines (Wang and Meiselwitz, 2015; Agbo et al., 2020). The improved social support networks, a retention rate of students through peer support, and perceived interaction are among the reported benefits of using social media in higher education for learning computing subjects (Wang and Meiselwitz, 2015). On the perceived benefits of using social media in computing subjects, students and faculty members have similar perceptions. Students' perceptions of learning with social media are positive as they believe it improves engagement and motivates them to learn (Wang and Meiselwitz, 2015). Students' decisions to use technology-enhanced learning tools like social media are influenced by several important aspects, including demographic, contextual, and behavioral factors (Hrastinski, 2007; Wang and Meiselwitz, 2015). Students are given the option to design learning environments and study subject material via social media to develop new knowledge (Frye, Trathen, and Koppenhaver, 2010; Lamb and Johnson, 2010). Moreover, educators value the ability of social media to enhance the access and availability of learning content (Wang and Meiselwitz, 2015).

Students actively communicate and use social media as a learning support tool to construct knowledge and form learning communities (Kabilan et al., 2010; Mendoza, 2015). Furthermore, social media provides an opportunity to share findings and feelings in discussions with specialists in the field (Aydin, 2012; Hrastinski and Dennen, 2012). In addition to contributing intellectual value to the learning process, social media can increase involvement, engagement, and reflective thinking and expand informal and formal learning (Mnkandla and Minnaar, 2017). Reflective thinking, for example, is linked to reading and content creation and the intellectual worth of the learning process and knowledge development. Furthermore, students' learning and satisfaction with the course material and organization are positively influenced by involvement and reflective thinking (Koranteng, Wiafe, and Kuada, 2019). Collaboration is considered a cornerstone of education; social media's educational potential is clear as it allows for collaboration, real-time debate, and knowledge or information sharing (Zachos, Paraskevopoulou-Kollia, and Anagnostopoulos, 2018; Koranteng, Wiafe, and Kuada, 2019). The use of social media in higher education fosters collaborative content generation, team networking, involvement, collaboration, and collective learning (Pratama, Hartanto, and Kusumawardani, 2018; Zachos, Paraskevopoulou-Kollia, and Anagnostopoulos, 2018). It plays an essential role in encouraging teamwork, reflective learning, problem-solving, and increased achievement, control, and ownership of learners' work (Junco, 2012). Students using social media to achieve a common goal or complete a task are more likely to acquire a strong feeling of community (Arnold and Paulus, 2010; Top, 2012; Manca, 2020).

From the literature, there are no specific concerns acknowledged by the computing educators. On the other hand, the literature reveals a list of potential concerns shared by most educators using social media in the classroom. Previous studies have extensively examined the drive to social media in education, focusing on social media theories and conceptual frameworks, social media potential, and drawbacks (Manca, 2020). Furthermore, when it comes to the use of social media for learning, common concerns among educators are choosing the appropriate pedagogy, the extra workload, and control over the preferred social media and its appropriateness for learning (Manca, 2020). In addition, among educators and students, the highlighted concerns are related to security, privacy, and the overall appropriateness of social media for learning (Junco, 2012; Anderson, 2019).

The possible drawback in using social media is that the presumption that students understand how to utilize social media may lead to a disregard for those students who require further supervision and instruction (Jackson, 2011). In addition,

when students don't have control over the medium they're using, they can't get information or contact their friends when they need it, which can contribute to feelings of isolation (Paliktzoglou and Suhonen, 2014a, 2015). It is difficult for students to balance their social media activities online with their academic schedules (Junco, 2012; Anderson, 2019). Moreover, students reported that they are distracted by social media information overloading. Several restrictions on the use of social media are mainly due to poor medium choice in formal learning environments by the instructor (Paliktzoglou and Suhonen, 2014b, 2014a).

Furthermore, academics may face difficulties with the diversity of social media platforms because they must choose from various social media to find the most appropriate. Also, some social media platforms might be challenging to utilize in education due to a lack of features and functions to aid education (Mnkandla and Minnaar, 2017; Anderson, 2019). Other disadvantages of using social media in the classroom include student access to technology, privacy concerns, plagiarism, bullying, and technical difficulties and limits (Chugh and Ruhi, 2018; Anderson, 2019; Manca, 2020).

3. SPECIAL ISSUE OVERVIEW

This special issue contains four articles.

In "Using a Modified Understanding by Design® Framework to Incorporate Social Media Tools in the Management Information Systems Curriculum for Generation Y and Z Students," Dana Schwieger and Christine Ladwig propose a modification to a well-established course design framework – Understanding by Design® – as a solution to combining Management Information Systems content and sought-after soft skills with social media tools and resources favored by the current college-aged population: digital pioneers and natives of Generations Y and Z.

The second article, "Incorporating Big Data Tools for Social Media Analytics in a Business Analytics Course," by Amir H. Zadeh, Hamed M. Zolbanin, and Ramesh Sharda, presents a social media analytics exercise that can be easily added to any analytics course or to any course in which students gain exposure to social media and big data technology. The case scenario is built upon using flu activity data on Twitter to extend monitoring of flu outbreaks. Their analytics framework comprises temporal, spatial, and text mining. They demonstrate the use of IBM InfoSphere BigInsights – a Hadoop-based platform – for implementing this framework. This exercise guides students through a big data, social media analytics journey that enables them to understand different aspects of social media as the primary source for big data and develop skills in this emerging area. The framework and the exercise are general enough to be used even if an instructor uses a different technology stack. The described approach was used in a class at a large university. At the end of the exercise, 27 students majoring in business analytics participated in a survey and expressed satisfaction with their learning process.

The third article, "Motivation in Gamified Social Media Learning: A Psychological Need Perspective," by Kingsley Ofosu-Ampong, Richard Boateng, Emmanuel Awuni Kolog, and Thomas Anning-Dorson, draws on the self-determination theory to test a proposed model for gamification uses in computing education. The general aim of the investigation was a course to prepare students to undertake a significant piece of individual work on a design project and help them appreciate the appropriate techniques in the management of information technology projects. The findings indicated a non-significant relationship between game rewards and improved competence and no positive relationship between competence and course satisfaction. The authors found that competition in a gamified environment contributes to the competence of gamification use but not the enjoyment of use.

The final article is "Investigating Students' Perception towards the Use of Social Media for Computing Education in Nigeria" by Friday J. Agbo, Kissinger Sunday, Donald D. Atsa'am, Ayobami Adegbite, Olayemi Olawumi, Oluwafemi S. Balogun, Ismaila T. Sanusi, Funmilola W. Ipeayeda, Sunday A. Olaleye, Emmanuel A. Kolog, and Frank Adusei-Mensah. This study examined the use of a social media platform – WhatsApp – by computer science students for learning computing education in Nigeria. In this study, students formed three closed groups, and each group had a specific computing topic they discussed. Student discussions were in the form of posting questions, providing answers to questions, or expressing knowledge on the group topic. The findings indicated that the use of social media contributes positively to students' learning achievement, and they are motivated to acquire more knowledge about different computing topics

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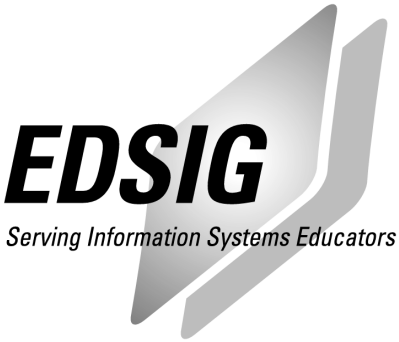

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