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Tweeters on Campus: Twitter a Learning Tool in Classroom?

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Abstract: Twitter is a well-known Web 2.0 microblogging social networking site that is quite popular for organizing events and sharing updates. It provides just in time communication, social connectivity and immediate feedback through Web, smartphones, tablet PCs, etc. The use of Twitter has also attracted educators and researchers due to its growing popularity among students, teachers, and academic communities as a whole. This study provides a critical review of Twitter use in educational settings. By practicing a systematic research methodology in the selection and review of literature, different pedagogical and instructional benefits and drawbacks of Twitter use in education were discussed. Based on these discussions, it was discovered that Twitter has positive impact on informal learning, class dynamics, motivation, as well as the academic and psychological development of young students. However, the potential long-term impact of Twitter on academic performance of students and its long-term effect on learning is still worth investigating.

Keywords: Classroom, educational technology, instruction, learning, learning management system, microblogging, pedagogy, Twitter
Categories: H.4.0, H.5, H.5.2, L.0.0, L.2.7, L.3.1, L.3.3, L.3.4, L.3.6

1 Introduction

Using educational technology for aiding and assessing students' performance and learning in higher education has received much attention lately [Gray, 10; Waycott, 11]. Educational technology is not only known for enhancing learning and academic goals for any learner but it also facilitates educational instruction and pedagogy. [Dhir, 12a]. Some of the prominently used digital technologies for educational reasons are multi-touch interfaces, white boards and augmented reality applications [Dhir, 12b]. Among the various technologies, microblogging has emerged as a popular choice between students and teachers for sharing and discussing education-related activities [Clarke, 12]. *Microblogging* is a combination of instant messaging

and blogging that enables its users to share brief information with other users and public audience [Clarke, 12]. This small information can include short text messages, pictures, audio, and video links due to microblogging's restricted message length.

Like other users, teachers have shown increasing interest in integrating new forms of technology into educational contexts. This includes utilizing different social networking services (SNS), microblogging platforms, and other forms of computer-mediated services in educational settings. All these platforms tend to support educational activities such as sharing of coursework-related materials, discussions, and feedback for enhancing student's engagement, learning, and literacy [Stevens, 08].

This paper aims to examine and to evaluate the challenges and opportunities present in the successful integration of Twitter, a popular microblogging platform into the mainstream educational systems. Twitter is an online SNS, Web 2.0, and microblogging platform that is increasingly getting more acceptable for professional social networking as it is used in industries like marketing and business, health and medicine, public relations, project management, and language learning [Crook, 08]. It is also used for personal purposes like meeting people and organizing courses and events. No wonder it is becoming increasingly popular since 340 million tweets are generated everyday and there are 140 million registered active Twitter users [Twitter Statistics, 12].

Many even believe that Twitter can act as an ideal technological platform that can extend instruction and learning beyond classrooms [Arbaugh, 07]. Recent statistics on the use of Twitter in educational settings revealed that Twitter has already made its place in the classroom instruction. Statistics show that 56% of 1400 faculty considered Twitter as a learning tool [Faculty Focus, 10]. Out of 1920 faculty, a huge percentage of participants used Twitter in their classroom instruction [Moran, 11]. In relation to this, McHugh pointed out that 80% of faculty used some form of social media for instruction [Moran, 11]. However, if we look at earlier studies between 2008-2009, there was a dramatic rise in the usage of Twitter for educational reasons. For example, in 2008, nearly 8% students used Twitter in classroom environment [Taylor, 08], 30.7% of faculty utilized Twitter for collaboration and communication, and 9.7% considered it as a learning tool [Twitter in Higher Education, 09].

For this study, Twitter was selected as a microblogging platform for three reasons: i) Twitter is very popular with over 500 million registered users [Twitter Statistics, 12]; ii)there is abundant research on the integration of Twitter in educational environments for-example [Grosseck, 08; Junco, 11; Junco, 12] iii) Twitter is featured by several educational characteristics namely accessible (through the Web, mobile, and emails), available, easy-to-use, fast (just-in-time communication, immediate feedback), and flexible [Twitter in Higher Education, 09].

Current research on this subject is concentrated on evaluating benefits and drawbacks of Twitter, examining its impact on students' motivation, and integrating Twitter with instruction and school curriculum. However, research dealing with evaluating Twitter as learning tool in the classroom is still young until today [Junco,12], and critical analyses of the benefits and drawbacks of Twitter in education is understudied [Lowe, 11]. Considering this gap in literature, this paper, systematically analyses the findings reported by earlier empirical, conceptual, and theoretical studies on Twitter and its use in education. Consequently, this current

work outlines various instructional and pedagogical benefits and drawbacks of using Twitter in educational settings. Additionally, this study has outlined the future research directions for researchers and practitioners interested in the utilizing Twitter for various educational purposes.

The rest of the paper is organized as follows: Section 2 presents the research methodology by first outlining the three main research questions, then by explaining the process of collecting and analysing research articles. Section 3 outlines the emergence of microblogging by presenting discussions from recent literature. Section 4 describes the usefulness of Twitter over commonly used learning management systems (LMSs) and gives an overview of Twitter use in educational space by discussing the impact of Twitter on learning process and student engagement. Section 5 sheds light on various instructional and pedagogical benefits of Twitter. Finally, Section 6 discusses various drawbacks and limitations of Twitter use in the context of the educational space.; it also draws conclusions and sketches future research directions.

2 Research Methodology

In this study, systematic literature review methodology has been practiced [Kitchenham, 09]. The research methodology consists of study research questions, collection and analysis of research articles. Figure 1 depicts the complete picture of the research methodology, which will be briefly described in the succeeding portions of this paper.

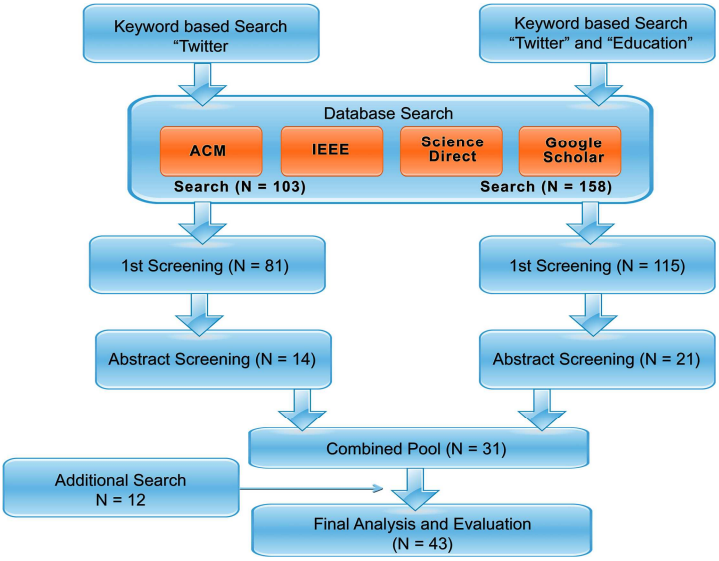

Figure 1: The research process of the study

2.1 Research Questions

This study poses the following main research questions:

a) What is the current research progress with respect to the use of Twitter in educational settings?
b) What are various pedagogical and instructional benefits and drawbacks of using Twitter in the educational space?
c) What are the future directions for fellow researchers and practitioners interested in this topic?

2.2 Collection of Articles

For the purpose of collecting of related articles, an online service called www.nelliportaali.fi was used. This online service facilitated the process of doing keyword search from multiple databases (i.e. Science Direct, Google Scholar, IEEE and ACM digital libraries) for this study.

The process of collecting related articles involved keyword search using two different keyword phrases namely "Twitter" and "Twitter AND Education". Both keywords were searched separately using this online service because the nelliportal.fi service did not provide keyword combination and search facility. The first keyword search "Twitter" returned a total of 103 articles while the second keyword search "Twitter AND education" returned 158 related articles. After these attempts to search for keywords, the first level of screening was performed (i.e. articles were screening at the abstract level).

During the first screening, searches leading to Google pages, blog entries, editorial and conference keynotes, and those articles that were obviously not related to the main research questions behind this study were ignored. After this step, a total of 81 articles were returned in the case of the first keyword search (i.e. "Twitter") while 115 articles were retrieved in the case of the second keyword (i.e. "Twitter in Education").

Subsequently, a second level of screening was performed where the title, abstract, keywords, and content of the articles were examined. Through this screening, a total of 14 articles were listed down from the first keyword search (i.e. "Twitter") while 21 articles were found in the second keyword search (i.e. "Twitter in education"). During the third level of screening, articles were returned after the second level of screening i.e. 14 and 21 were combined and duplicated were slashed. This resulted in a net of 31 articles.

In order to compliment the search of articles followed so far in this research methodology, an additional search was carried using Google scholar so as to extend the search and to glean the highly cited searches on "Twitter and its use in educational setting". This additional search produced 12 articles, which were combined with 31 other articles. Therefore, a total of 43 articles were examined and evaluated.

2.3 Analysis of Articles

After the collection of research articles, following two stages were performed for carrying out the analysis of 43 resulting articles. In the first stage, the selected articles were categorized based on the main argument and claim that each paper presented. In the second stage, an in-depth analysis was performed in order to organize the studies

into resulting categories. There were no pre-planned or pre-organized categories and themes but a grounded theory was utilised in this study [Corbin, 90]. The three main research questions acted as a guiding source while the process of analysis of 43 articles was active (i.e. current research progress with respect to the use of Twitter in education, the pedagogical benefits and drawbacks, and the future directions for this topic).

3 The Dawn of Microblogging Era

The concept of microblogging is not very old as it dates back to 2005 when first microblogs came into the limelight. In those early times, microblogging was referred as "tumblelogs," which means "*quick and dirty stream of consciousness*". However, later in 2007, it was rephrased as "microblogging" and it gradually became popular among Internet users [Ebner, 10]. Some of the popular microblogging platforms are Twitter, Plurk, Pownce and Jaiku [Ebner, 10]. Microblogging platforms are known for their open accessibility from almost any platform such as the Web browser, smartphones, and tablets [Dunlap, 09; Zhao, 09].

Microblogging is deemed effective in educational settings as it enables information to flow between fellow students and teachers beyond the physical boundaries of the classroom [Ebner, 10; Grosseck, 08; Ebner, 08]. Adopting microblogging in educational context has the following benefits [Grosseck, 08; Ebner, 08]: i) continuous and transparent communication among teachers and their students [Ebner, 10], ii) facilitation of educational activities like instruction, learning, immediate and direct feedback [Ebner, 08; Retelny, 12], iii) facilitate the documentation of the processes that help in correcting student concepts beyond classroom boundaries [Ebner, 10; Stevens, 09], iv) collaboration support [Dunlop, 09; Ebner, 10], v) loose and informal learning via informal communication [Ebner, 10; Dunlop, 09], vi) venue for students to express their opinion and thoughts freely without any restrictions [Johnson, 09; Ebner, 10; Stevens, 08], vii) possibility of providing immediate feedback which is vital to the learning process [Rankin, 09; Parry, 08; Borau, 09], viii) enhancing social interactions which can be useful for performing group work [Ebner, 08; Grosseck, 08], ix) adds transparency to learning process and group work (i.e. ensures fair grading in a group work scenario where free-riding is a big problem and useful for timely intervention and clarification of wrong concepts) [Ebner, 10] (See Figure 2).

The ever-increasing popularity of microblogging platforms such as Twitter has motivated educational and IT researchers to examine and to evaluate its potential use in education [Borau, 09; Ebner, 08; Gaonkar, 08; Ramsden, 08]. This is because of the way Twitter facilitates sharing by fostering friendships, posting updates, sharing experiences, opinions, and other quick notifications with others, irrespective of the chosen tool for microblogging [Java, 07]. In one of the recent studies, [Ebner,10] attempted to understand how students are using Twitter in the context of their assignments and courses. This was done to understand the role of microblogging process in the context of Twitter to support informal learning and how public and individual timelines in Twitter can be used for documentation in a process-oriented learning.

The next portion discusses the role Twitter in educational spaces by reviewing existing empirical and case studies on the subject.

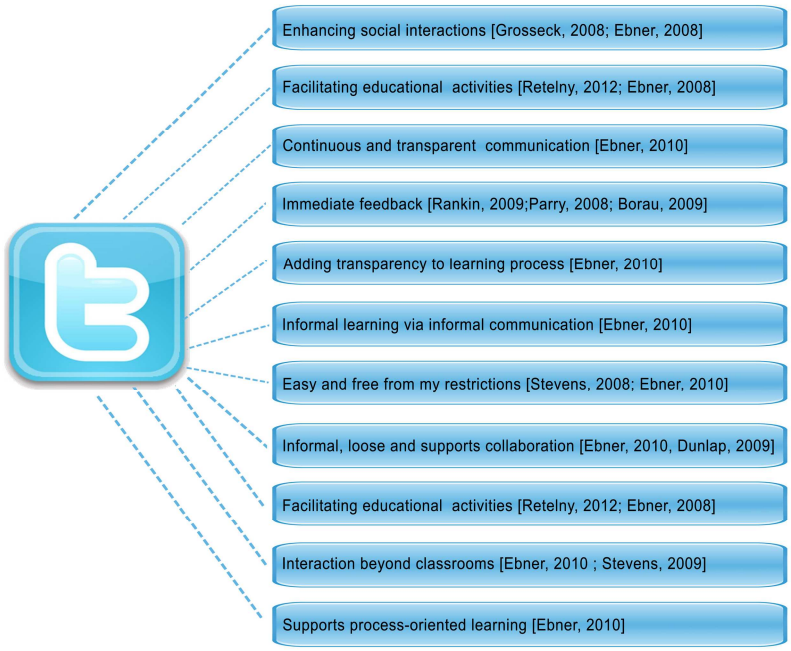

Figure 2: An overview of the different benefits of Microblogging(Twitter)

4 Learning Management Systems (LMSs) versus Twitter

The last decade has witnessed the emergence of Learning Management Systems (LMSs) in the classroom environment that and these LMSs have revolutionized the traditional forms of teaching and instruction.

An LMS is defined as a software system that helps in administration, management, and reporting of course and training related initiatives (e.g. Blackboard) and provides interaction possibilities to both teachers and students who can share information and knowledge between them [Dunlap, 09]. However, any typical LMS suffers from several shortcomings such as the lack of support to just-in-time and spontaneous communication. Furthermore, LMSs do not provide out-of-classroom interactions between teachers and students; rather, they are closer to the traditional classroom confined to teaching and instruction [Dunlap, 09]. Out-of-classroom interactions are considered important from instructional value point of view [Kuh, 95] as they help students build interpersonal relationships; moreover, these interactions bring teachers and students close to each other. Existing LMSs provide limited opportunities of communication and interaction between teachers and students as they have to login to the LMS system before they can perform any sort of communication

[Dunlap, 09]. Therefore, LMSs support only limited social interaction between teachers and students [Dunlap, 09].

Social presence is a well-known term in the field of educational research. It is defined as the ability of students to showcase their personal characteristics in the community, (e.g., through the discussion board of online courses) [Garrison, 00 pp 89]. Social presence is also used to describe the quality of conversation taking place between two entities in any communication medium, (e.g., communication taking place among students themselves, and between students and their teachers) [Dunlap, 09]. Previous studies have shown that a direct relationship exists between social presence and student satisfaction [Gunawardena, 95; Gunawardena, 97; Richardson, 03] and a similar positive impact was observed on learning, too [Richardson, 03; Rourke; 01; Rovai, 02]. Similarly, [Dunlap, 09] found that Twitter has positive impact on social presence while [Grosseck, 08; Rankin, 09; Ebner,10; Schroeder, 10] concluded that Twitter use is beneficial for students' learning process.

In Figure 3, the relationship between social presence, student satisfaction, and the learning process is presented. Twitter has direct positive impact on social presence and the learning process while social presence positively affects student satisfaction and the learning process respectively.

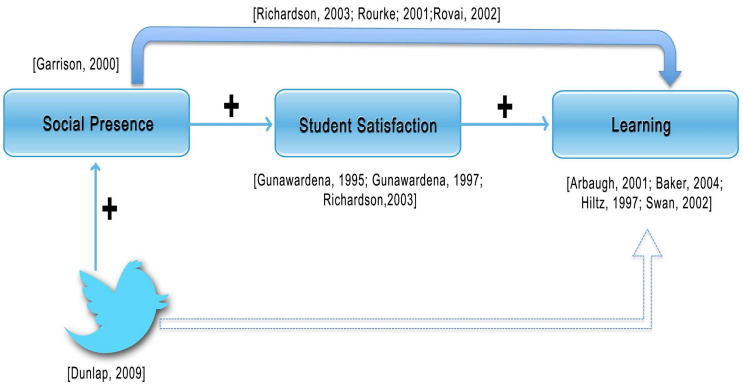

Figure 3: The relationship of social presence, student satisfaction and the learning process

Believing that the social presence has a potential impact on students' learning, researchers and practitioners have focused on building social presence in existing LMSs through the use of audio and video [Argon, 03], texting [DuVall, 07], Internet-based voicemail [Keil, 02], frequent feedback to students [Aragon, 03], posting regular updates and instructions [Aragon, 2003], discussion forums on non-academic topics [DuVall, 07], music playlist week where student produce the music list for the week [Dunlap, 09], other fun activities including online gaming [Dunlap, 09] , captions and associating funny pictures with the discussed topic [Dunlap, 09]. However, all these strategies did not work and were inefficient at enhancing the social presence in existing LMSs [Dunlap, 09].

Such known limitations of LMSs compelled researchers to propose using microblogging platforms, such as Twitter, in the education ambience. Twitter enables

continuous and transparent communication among teachers and their students [Ebner,10]. It helps these stakeholders to work freely on a given problem without facing any restrictions pertaining to attendance, presence, time, and place [Stevens, 08; Ebner,10]. Twitter supports informal, loose, free-flowing, just in time communicate on and chitchat possibilities for students [Dunlap, 09]. Additionally, it helps students and teachers share personal experiences related to their courses and studies; moreover, Twitter also helps these individuals to know their peers and classmates, even connect at a more emotional level [Dunlap, 09].

Educators often find it difficult to keep students engaged into traditional forms of educational practices. Twitter is intrinsically a vital engagement tool as it compels students to practice effective communication between peers and share content and opinions with others [Ebner, 10; Junco, 11]. Educators can tap these features and use them for igniting discussions among students, delivering reminders, and distributing course material [Ebner, 10; Junco, 11].

Despite its popularity, the role of Twitter in the education field is scarcely investigated [Borau, 09]. Much of the present work is based on high-level discussions such as personal thoughts and opinions in blogs [Al-Khalifa, 08; Copper-Taylor, 08; Lew,07], web sites [Twitter for Teachers, 12], and research papers [Grosseck, 08; Stevens, 08; EDUCAUSE, 07]. A few studies also looked into integrating microblogging platforms such as Twitter into academic environment (e.g., how to use them in courses and term projects) [Junco, 08; List, 09; Vargas, 09; Sample, 10].

The next section examines Twitter as an educational instrument by evaluating its impact on learning, student engagement, teaching, pedagogy, and instruction.

4.1 Twitter in Educational Spaces

It is commonly noticed that certain populations of young students are lesser confidant and comfortable in face-to-face discussions because they often ignore this commonly used mode of communication inside the physical classrooms [Chester, 98]. However, it was found that students feel more comfortable communicating with peers and teachers via computer-mediated communication [Chester, 98]. Considering this advantage of computer-mediated communication, Stevens, [2009] examined the usefulness of Twitter in enhancing teacher-student interaction. It was found that Twitter enables students to interact with teachers [Stevens, 09] and allows them to get immediate feedback from their instructors, which is not possible in large classroom settings [Rankin, 09; Parry, 08]. In this regard, [Carlson, 98] stressed the importance of dynamic relationship between students, teachers and computer-mediated tools.

All students are not same in terms of their learning abilities in any classroom and non-classroom environment. There are some students who face problems related to re-calling and learning so they are commonly referred as students suffering from Learning Difficulties (LDs) or cognitive disabilities that might be caused due to biological factors [Vera, 05]. Lately, research governing screening of LD's and developing assisting technological tool for children suffering from LD's has gained much needed attention [Al-Wabil, 2012; Girgin, 2011]. Twitter provides documentation capability to its users i.e. students can obtain a summary of different learning-related activities on any course group [Ebner, 10]. Therefore, Twitter supports re-call facility, which in a way is much, needed for students suffering from LDs. However, based on our extensive literature review, we concluded that research

examining potential benefits of using microblogging platforms such as Twitter by students with LDs is still young field of research.

Twitter was reported as a tool for enhancing the social interaction and learning among students by facilitating discussions during the course (e.g., on course material and after the course for sharing experiences and learnings during the course) [Rinaldo, 11]. For this reason, educators often argue in favour of Twitter as it provides positive impact on the overall learning process of students [List, 09]. Veletsianos [2011] examined different aspects related to the latent motivation for participating on Twitter. It was found that users are interested in sharing information to others because of topics related to their profession and business. Other purposes included taking and giving assistance related to coursework, interacting with student community, and creating digital identity.

Markham [2011] made an attempt to evaluate whether Twitter can be used as an educational tool in the classrooms. It was found that Twitter is not the best option for social education even though it proves to be a useful tool for establishing and managing collaboration irrespective of physical distances. In another study, Borau [2009] found that Twitter is better against commonly used discussion boards since it requires short turns (i.e., short messages can be posted without taking much time compared to discussion boards). Retelny [2012] examined how Twitter could be used for co-constructing the lecture material based on the feedback, suggestion, and opinions expressed by the students. The study emphasized the role of students as active participants in the construction of course material, where students can openly reflect their experience, likes, and dislikes about the topics to be discussed in the lectures. This strategy was found effective on active student learning.

Parry [2008] argues that at the beginning of his study, many teachers were hesitant about the use of Twitter in day-to-day teaching; however, they realized later that Twitter can be an effective tool in classrooms as it changed the traditional notion of classroom teaching. Similarly, [Eyadat, 2010] emphasized that educational administration should stress that their teachers adopt newer instructional technologies for classroom instruction. Twitter not only provides the facility for sharing information with others in its open community; it also ensures that users can get the opportunity to participate in someone else' work, (e.g., by reading, commenting, discussing, and giving feedback when required) [Ebner, 10].

Recently, an increasing number of researchers started to give more attention towards the potential impact of Twitter on students' learning, engagement, teaching, classroom pedagogy, and instruction [Grosseck, 08; Rankin 09; Ebner, 10; Schroeder,10]. All these are considered as essential elements of any educational space.

The rest of this section presents the impact of Twitter on learning, the learning process, and its relationship with student engagement.

4.2 Twitter and the Learning Process

Different disciplines define *learning* from their own perspectives. For example, literature on sociology states that learning is the result of social process that emerges from individual and community-based learning experiences [Bandura, 86]. On the other hand, literature on psychology states that learning is a social activity that becomes better in an environment composed of social interactions because cognitive

processes get active when social interactions take place [Vygotsky, 78]. Similarly, in the field of education, learning is defined as a situated activity in which learners experience different lessons through socio-cultural activities [Veletsianos, 11]. Therefore, interdisciplinary views on "learning" show that it is a social activity, which is facilitated by social interactions. Considering the importance of social interactions in learning, educational researchers have shown increasing interest in integrating social networks such as Twitter into educational settings. For example, it was found that Twitter use has positive impact on the learning [Junco, 08; Cotten 08] and the learning process [Grosseck, 09; Rankin 2009; Ebner, 10; Schroeder, 10].

Figure 4 presents the impact of Twitter on the different attributes of learning and the learning process. As defined above, learning is a combination of social and cognitive process, individual and community experiences, social interactions and socio-cultural activities. Twitter has positive impact on both learning and learning process.

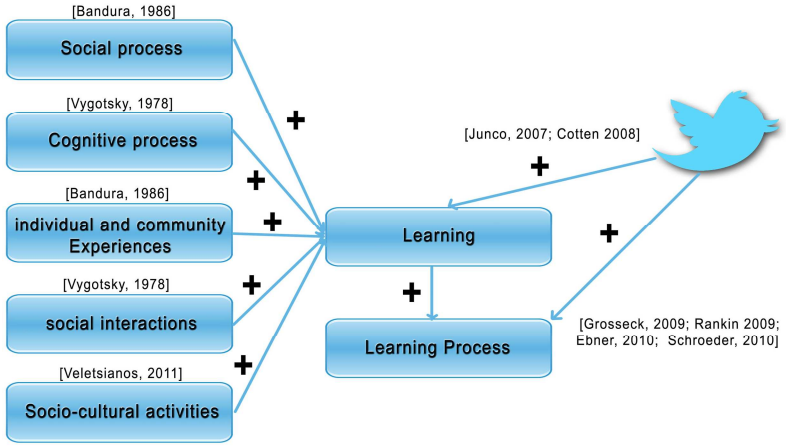

Figure 4: The impact of Twitter on different attributes of learning and the learning process

4.3 Twitter and Student Engagement

Student engagement is a decisive factor for the success of any pedagogy and it can define learning and educational literacy outcomes. The word "engagement" has several different meanings in the existing literature but for the purpose of this study, three definitions are pointed out. The psychology literature defines engagement as the amount of psychological and physical energy devoted by student in any academic activity [Astin, 84]. However, from the learning perspective, engagement is defined as the time and effort that any student invests in educational activities for achieving desired learning outcomes [Kuh 09]. Similarly, from the instructional and pedagogical perspectives, engagement is defined as the investment in pedagogical activities (e.g., interacting with teachers and peers, and energy spent during coursework and classroom instruction) [Kuh, 09; Pascarella, 09]. Therefore, in this study, "student engagement" stands for psychological and physical energy, time and effort, and the

pedagogical and instructional commitment of students and teachers towards academic goals.

Earlier work in educational activities management [Chickering, 87] proposed seven key principles that are essential for student engagement. These principles are i) supporting cooperation among students namely active learning, ii) advocating student-teacher interaction, iii) encouraging prompt answer, iv) providing feedback to query, v) delivering tasks on time, vi) communicating high expectations, and vii) respecting diversity among students. Existing studies have shown evidence that there is a positive relationship between the use of educational technology and boosting students' engagement [Chen, 12]. Likewise, social media tend to enhance the learning process and positively contribute towards student engagement [Junco, 11; Junco, 12]. Other than this, shared communication and relationships between students and teachers (both inside and outside of classroom) also have potential impact on student learning and satisfaction [Arbaugh, 01; Baker, 04; Hiltz, 97; Swan, 02].

All the above-discussed attributes are essential for the achieving high student engagement. Therefore, by considering the importance of these different attributes of engagement, the use of Twitter as an agent for enhancing students' engagement has been examined. In Figure 5, various attributes of student engagement are presented (i.e. a combination of psychological and physical energy, time and effort, teacher-student relationship, and a result of any educational technology-use and investment in pedagogical strategies). All these attributes lead to engagement, which in turn directly impact the learning process. Existing studies [Ahmad,12; Junco,12, Ebner,10; Junco 11] concluded that Twitter has positive impact on engagement as well as learning.

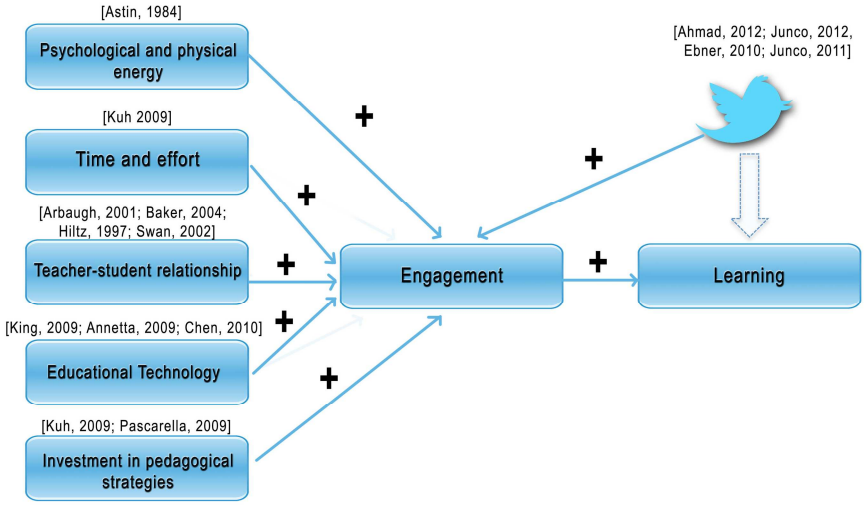

Figure 5: Attributes of Engagement and their relationship with learning and Twitter use

5 Instructional and Pedagogical Benefits of Twitter

Instruction is defined as the activity related to the planning of learning outcomes, experiences, and course outcomes based on a defined school curriculum while pedagogy is defined as how the teacher or educator teaches and interacts with students in the classroom in order to achieve different instructional experiences [Rodriguez, 11; Leach, 99]. Based on the extensive literature review, it can be summarized that the prominent instructional and pedagogical benefits of Twitter are as follows:

1. **Timely addressing of student issues***:* Twitter helps and addresses different student issues in a timely fashion. Problems can be course registration, change of lecture room, or any confusion in the given assignment [Parry, 08; Grosseck, 08]
2. **Students learn to write concisely:** Twitter is a combination of communication and personal publishing and this duo result in real-time publishing [Grosseck, 08]. Due to the imposed restriction on the message length (i.e.140 characters), students learn how to express their ideas or questions concisely and articulately.
3. **Impact on reading and writing Skills:** The use of Twitter fosters writing, comprehension, reading, and even critical thinking of young students. Students learn how to write effectively and address a large audience of people properly. Additionally, Twitter has a documentation capability, which can help students to obtain a summary of different learning-related activities [Ebner, 10].
4. **Bonding:** Twitter helps build student-teacher relationship and eases the communication between these stakeholders. Teachers can advise their students both academically and professionally even if they are not in same geographical location.
5. **Supporting formal and informal learning:** Twitter acts as a facilitator for students in their learning (i.e. enabling them to access archival logs dealing with prior discussions among the students and teachers with regard to any concerned topic) [List, 09]. Additionally, Twitter supports self-learning mechanism (i.e. students are self-directed towards their learning goals at their own personal time) [Aspden, 09].
6. **Enhancing social presence***:* Twitter enables students and teachers to reach out to a larger audience of academic and research communities.
7. **Socially and professionally responsible**: Twitter enables students to convey their feelings and expressions to others in concise and sensitive ways by tweeting. Students also learn to make professional decisions as to what kind of information can be shared publicly. In the long run, students progressively learn to become more responsible and mature.
8. **Greater privacy and comfort**: Twitter supports various privacy features (e.g., students may choose to converse with other students or their instructors through direct message facility) [Grosseck, 08].

9. **Cultural competence:** In today's connected world, one should possess the imperative skill of effectively communicating with people across cultures. Students indirectly learn and enhance their cultural competence while using Twitter [Borau, 09]. They learn how to interact and communicate effectively with people from different cultures, backgrounds, and demographics.
10. **Personalised teaching***:* Personal interaction and contact keeping with every student in large classrooms is not possible with larger class size and limited teaching time. Therefore, a conversation tool such as Twitter is effective for providing personalized teaching possibilities. With Twitter, students can continue learn at their own pace and contact fellow students and teachers to resolve queries that they experience while studying. Therefore, attendance is not required when participating in this type of learning process, [Parry, 08]
11. **Accountability**: Accountability is a must for learning and educational literacy, (i.e., students must be accountable for learning outcomes of any educational settings). Educators can use Twitter to keep track of their students' performance and progress. It also provides immediate assistance whenever required [List, 09].
12. **Dissemination of Educational Material***:* Educators can use Twitter in disseminating course content to a large group of students. Using Twitter enables educators share web links, audio, video, and text based content to different educational stakeholders.

6 Drawbacks of Twitter in Educational Context

Throughout our literature survey, a number of drawbacks and limitations associated with Twitter were discovered, especially when it comes to using it in education. Some of the potential drawbacks and pitfalls are:

1. **Addiction and distraction***:* Twitter might impose superfluous distractions to activities that are irrelevant to the course work. Additionally, Twitter use can be addictive for students.
2. **Time waster***:* Students could waste valuable time if they get busy with writing and reading irrelevant messages on Twitter.
3. **Constraints towards freedom of expression***:* Limited character length of Twitter message forms a hurdle to the freedom of expression [Ebner, 10]. Many tweeters believe that due to character limit, they have to cut short their sentences and sometimes the main message of that particular tweet is lost. Additionally, restricted character limit for every message might weaken students' grammatical skills and engagement in other wasteful activities.
4. **Privacy related concerns***:* Privacy is deemed an important challenge when using Twitter due to its open accessible nature [Grosseck, 08].

5. **Not an all-purpose tool*:*** Twitter imposes certain restrictions because it cannot act as an all-purpose tool for educational purposes. This includes limited message size, restricted history, difficulty in following threads, and inefficiency or limited search capability [Markham, 11; List, 09].
6. **Taken lightly as an educational tool***:* The use of Twitter might result in potential negative impacts on education as students may not take it (e.g. [Hussein, 10]) or use it seriously as part of their traditional classroom tools such as textbooks and other physical materials [Clarke, 12].
7. **Lack of User Grouping:** Twitter does not support the creation of user groups or even user classification via tagging. This kind of grouping is sometimes needed in order to create some groups of students and make them work on specific tasks or projects [Grosseck, 08].

7 Conclusions and Future Directions

This paper has presented a critical review on Twitter use and its applicability in the educational settings. By practising a systematic research methodology in the selection and in the review of previous literature, different pedagogical and instructional benefits and drawbacks of Twitter use in education were examined. It was found that large body of work discussed the role and use of Twitter in education; however, rare solid empirical evidence exists that confirm the long-term positive impact of Twitter on students' learning and academic performance. This might be partly due to the young age of Twitter as a microblogging tool, while such empirical studies demand its due time of observation.

Therefore, the research theme examining Twitter use and its integration into educational instruction is still tempting for IT and education researchers. Based on this systematic review, a framework for future research on this topic has been presented in Figure 6. This framework shows that Twitter has positive impact on informal learning, class dynamics, learning, social skills, social interaction, motivation, academic and psychological development. It even helps students to learn foreign languages. However, the long term impact of Twitter on learning, academic performance, and educational spaces are unknown at the moment.

In conclusion, it was found that existing empirical studies demonstrated that Twitter has some merits when it comes to informal learning, class dynamics, learning social skills, learning different languages, social interaction, motivation, and also academic and psychological development of young students. Nevertheless, we still need more experiments that can assess the long-term impact of such a tool on the academic performance of students as some researchers alluded to mixing signals concerning this point [Ahmad, 12].

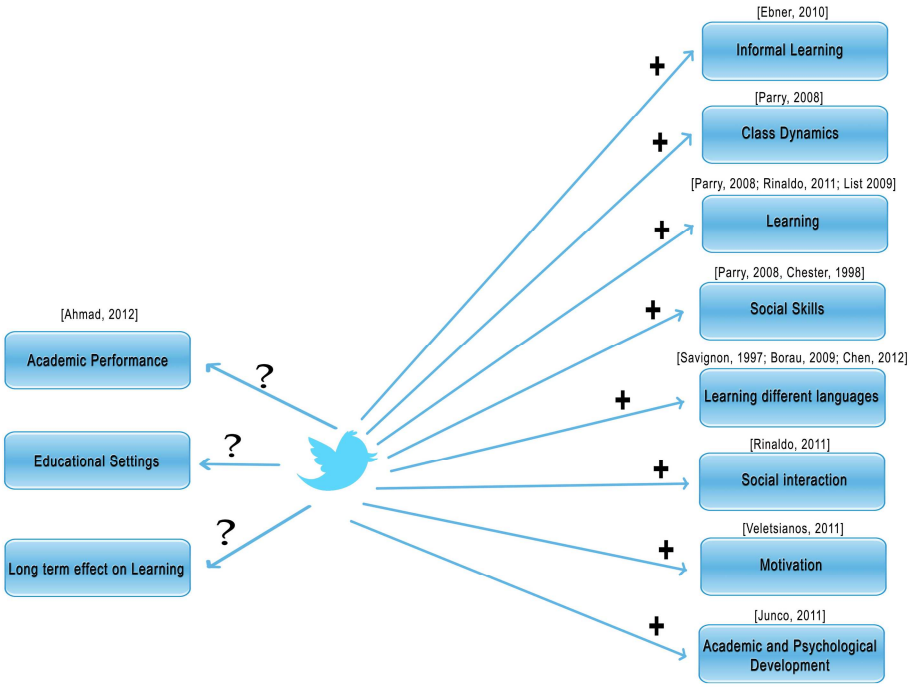

Figure 6: Future Research Agenda for Twitter Use in Education

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