Using Twitter to Enhance the Students' Skills: Motivation – A Disregarded Factor in Educational Design

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Abstract. While observing the context of formal learning, as far as the personal and general use of the network technologies to access information and the Social Networks (SNs) are concerned, it is inevitable to acknowledge the scarcity of cases where such technologies are used in support of teaching & learning activities. The potentialities of this type of technologies reside in the very creation of not only a bridge between formal and informal learning contexts, but also, and above all, of a very intense integration. This research paper explores the effectiveness of using Twitter to support a course titled "Sound Recording" in Music Technology. This tool allowed an increase of the motivation of all the students (in particular dyslexic students), getting them involved in team work, based on the Problem-Based-Learning principle. Results showed that students with dyslexia compensated for their processing deficits by relying on learning strategies and help seeking.

Keywords: Dyslexia · Learning · Motivation · Social Network
Twitter

1 Introduction

Social Networks are increasingly taking root as habitual communication, expression and socializing tools [1]. Their capillary penetration into any context and at any time of everyday life requires an acknowledgment of the role that these technological resources already play and will ever more frequently play within a real sustainable didactic-educational innovation process.

In this respect, we must take into consideration that while students are comfortable with using the Web 2.0 technologies, teachers find it equally difficult to use them, being skeptical about the possibility to introduce them in a learning process [2].

It is not the simple introduction of technologies into the classroom that can create innovation in didactics: cultural change is needed in order to go beyond the concept of the classroom being the context within which knowledge is passed on, to the learning environment intentionally designed by the teacher, in which students use different technologies in an integrated manner, taking advantage of their potentialities and allowing the students to become protagonists in the knowledge building process [3].

The Web technologies, therefore, are tools for education, yet the teacher must have an adequate knowledge of them so as to be able to assess which tools, how and in what contexts to use them. These choices may not disregard the "class" intended as a group of students having heterogeneous learning styles. The presence of dyslexic students imposes on the teacher certain didactic choices that help such students and that also turn out to be useful for **all** the other students (the non-dyslexic ones) in order to make didactic practice more efficient, the study method more conscious and the learning more long lasting and more profound [4].

The use of technologies is accompanied by an increase of the students' motivation, in general (be them dyslexic or not): they all grasp the important role it plays, but few of them actually know what they are and how to use them systematically [5]. Usually, "motivation" is considered a preliminary stage that must be dealt with upstream from the veritable educational stage [6]; however, motivation is never considered a central element of the actual educational process [7, 8].

This article will present a case study, based on blended learning and Problem-Based Learning (PBL), used in the Music High School, to convey information about the Sound Recording. The main aim of this project was to assist students to construct knowledge and develop skills in problem solving, communication, cooperation, negotiation, and decision making. Moreover, it was checked on and assessed the impact of the use of ICT in the students' learning process: increase the student's motivation in order to see if it corresponds to an improvement of his/her academic results. For this reason, it has been decided to introduce the use of Twitter in the classroom.

This paper is organized as follows.

Section 2 describes the Social Network. Section 3 explains the choice of Twitter. Section 4 shows the learning indicators for the *assessment* of the *Learning Process*. Section 5 shows an experimental test that illustrate the effectiveness of the proposed method. Finally, conclusions are drawn in Sect. 6.

2 The Social Network

The Social Networks may be considered a tool "for and of didactics" and the common feature of these environments is content sharing [9]. The social networks would, therefore, be characterized by [10]:

(1) uniquely identifiable profiles, made up of content supplied by the user, content supplied by other users and/or data provided at a system level;
(2) publicly structured connections that may be viewed and browsed by others;
(3) features that allow the users to consume, produce and/or interact with flows of content generated by the users that are supplied by the existing connections.

However, every Social Network has an intrinsic feature that distinguishes it from the others: on Facebook you can post photos and videos or see the ones shared by other users, or chat with your friends who have signed up; WhatsApp is a fast and easy alternative to the usual text messages (SMS) to "chat", because it can be used on the cell phone; to post the photos you need to use Instagram.

Certain conditions must be implemented [11, 12] for technologies to be used as a learning resource and not to be "neutralized" by a traditional use that subjects them to a transmissive didactics. First of all, real homework must be proposed to students, that should get them involved in resolving problems, in searching for information or in building artefacts (for instance relationships), thus giving more meaning to the needs of knowledge and of commitment. Technologies must help to open the class towards real interlocutors [13] (be them other students to collaborate with or experts to ask for advice), near or far, of different languages, culture or ages.

3   Why Twitter?

The name "Twitter" derives from the English verb to tweet. Tweet is the term used to identify a message.

Twitter is considered a Social Network characterized by an environment within which participants may share "what they are doing", by means of short messages (Tweets): a message may not exceed 140 characters and it may include an image as well. This characteristic makes Twitter similar to a microblog [14], where the interested people may participate (in a synchronous or an asynchronous fashion) in a "conversation" on certain topics. Every message may be made visible only to certain people or to everyone.

Therefore, Twitter permits: information sharing, information seeking and friendship-wide relationships [15]. Sharing information means sharing knowledge. What is important in Twitter is not this information sharing, but rather, the opportunity to be part of someone else's process by reading, commenting, discussing or simply enhancing it [16].

Twitter allows inserting a tag (hashtag) to a topic: this is non other than a word or a phrase (without spaces) preceded by the # symbol. It is enough to type a hashtag in Twitter's search box to immediately generate results that are focused on the topic.

Twitter may, therefore, be seen as an environment that allows the teacher to share and "converse" on certain topics (interests) with a large audience (community), using informal communication techniques. There is a dynamic nature within these audiences given the context of continually evolving participants in the Twitter environment. The teacher may design a learning process based on Problem Solving (Problem Based Learning) [17], inserting as discussion topic a query relevant to a certain set of problems to solve and taking advantage of the community to solve them.

This brief overview of Twitter is enough to understand its potentialities with respect to the "motivation" factor and it highlights certain relevant characteristics that may respond to the needs of a dyslexic student: characteristics that may help him/her to integrate spontaneously into the group work, rather than isolate himself/herself. The dyslexic student has intuition, the capacity to synthesize and the problem-solving capacity. The conciseness of the messages helps the students who have a hard time reading and it does not tire them when learning the content; the insertion of tags helps them in the text analysis; the possibility to write short messages helps them to develop the capacity to formulate a question or an answer (moreover, the automatic spell checker, already present in all devices allows them to avoid possible spelling errors); the possibility to intervene when they want helps the students to organize and manage their time.

4 The Role of Assessment in the (Ongoing) Learning Process

In this new context where students learn through the Social Network, the central role is played by the operations of monitoring and analysis. Without them the online environment will barely be able to emancipate from a perception that envisages it only in ancillary terms with respect to the education system and not, as it should be, as an element integrated into it and, actually, able to guarantee added value to it [18–20]: the monitoring and analysis of the learning processes assume an indispensable role for the development of quality processes. In this context emerge the necessity to ponder on the relationship that the technologies have with didactics so as to monitor both the changes in the learning habits and styles of the students [21, 22].

On the basis of the above considerations, in Table 1 there are some indicators that the teacher could consider to evaluate the (ongoing) learning process.

Table 1. Indicators to evaluate the (ongoing) learning process

Indicators referred to the internal process	• Construction of simple sentences for the message • Query formulation manner • Motivation to explore and search connections • Sustain a thesis on a problem, with a rich and complete variety of topics (connected to one another) • Use of the technical terms in simple sentences •Ability to cooperate with the group members •Take part in different dialogues • Reduction of the times needed to find the adequate solutions • Creation of a shared repertoire of technical terms • Express and compare knowledge levels within the work group
Indicators referred to the learning and growth process	• Number of messages • Number of days before a question receives an answer • Messages of people outside the classroom • Questions based on the problem • Choosing the adequate strategy to solve the problem • Quality of the formulated hypotheses (to solve the problem) • Acknowledgment of the set of problems as already solved in a preceding case • Number of ideas to solve a problem • Number of the resources found and shared related to the (similar) problem • Use knowledge of the order of procedures to carry out the problem

Table 1. (*continued*)

	• Take different standpoints into account, compare them and seize the strengths and weaknesses and express an opinion on their validity
	• Number of tags proposed
Indicators referred to the user's perspective	• User satisfaction degree
	• Increase of the awareness of the group work
	• Activity sharing approach
	• Increase of the self-worth

5   Application and Analysis/Research Method

The objective of this research was to examine the educational potential of Twitter analysing his reflections on students' interest, participation and interaction. Twenty-seven students in a music technology course were involved; the samples were made up of 13 girls and 14 boys, of which 2 affected by dyslexia with difficulties in reading and writing.

The research was conducted for a time period of 5 months, from January 2017 to May 2017 (for a total of twenty weeks) and the goal of the project was to realize a sound effect based on the Granular Synthesis. Granular Synthesis is a method by which sounds are broken into tiny grains which are then redistributed and reorganised to form other sounds. To realize the project, students had to use an object-oriented visual programming environment: a software that permits to realize the sound effects by means of *patches* by arranging and connecting building-blocks of *objects* with virtual cables. These objects act as self-contained programs (in reality, they are dynamically-linked libraries), each of which may receive input (through one or more visual *inlets*), generate output (through visual *outlets*), or both. Objects pass messages from their outlets to the inlets of connected objects.

At the beginning of the period an entry test (identical for non-dyslexic and dyslexic students) was carried out in the classroom with the aim to gather information about the knowledge of specific technical terms and topics. On the base of the results, the teacher decided to organize two lessons to supply information about some terms so as to help the students to develop the project.

For the first two months the students participated in the lessons in the classroom listening to the teacher's explanations and taking notes in addition to the teacher's lecture notes. During this period the students were introduced to:

– the knowledge of electroacoustic music and digital sound synthesis techniques,
– the use of an object-oriented visual programming environment.

Simultaneously, Twitter was used with simple questions related to the topics explained in class, to analyse the presence of potential doubts and then try to exceed them by group work. This way we tried to make the students more familiar with this new didactic tool.

In order to ensure the necessary high standards of the results, the following three aspects were taken into consideration:

1. *Content:* the content of the message was checked to verify that it supplied the right information.
2. *Language:* the language of the message was checked in order to ensure clarity and correct use of technical terms. It is important that the message was clear, not only for the group of students, but especially for the dyslexic students.
3. *Format:* the format of the message was checked, in order to ensure that it summarized the stated concept.

In the last three months, during the in-class lessons, the students were introduced to practical application of the Granular Synthesis. Simultaneously, a didactic path was initiated on Twitter, where the teacher suggested a set of examples different than the ones analyzed in class and the students were asked to realize the Sound Effect (by means of Granular Synthesis), motivating and documenting their own choices and commenting on the messages of other students.

The most important problem emerged during this second period of the project, for all of the students, was the identification of the mathematical procedure useful to obtain the required result. Each example proposed by the teacher required a different approach to reach the result analysing the problem under a different point of view. This allowed the creation of a repository with information about technical terms, mathematical methods and objects and their connections. The students who encountered problems could refer to this repository to get information about similar situations or to solve some doubts. It was very easy for them to find an information thanks to the tags and this has enabled them to reduce the average time of their personal study.

At the end of the project, an examination, identical for non-dyslexic and dyslexic students. was carried out. Students had to realize a Sound Effect on the base of specific recommandations of the teacher. The dyslexic students were allowed to use the compensatory tools and the dispensatory measures, specified in the PDPs (Personalized Didactic Plans). The assessment were based not only on the completion of the task but even on the correct use of the appropriate objects and their connection.

The results were very sattisfactory. There was a positive mark within the classroom and, above all, for the dyslexic students.

Two main purposes emerged from the analysis of the tweets: instant communication and content sharing.

At the beginning of the course (first two months), students' participation on Twitter was very poor: in their opinion Twitter did not involve any advantage, but also any drawback. In the second period (last three months) students find the activity on Twitter more interesting, challenging and enjoyable, as well as it allows self-directed (see Fig. 1).

From an ex-post questionnaire submitted to the students it emerged that most of them agreed or strongly agreed to have drawn benefits from Twitter via interactive learning, instant communication and autonomous learning.

The project highlighted that the students who used Twitter to managed to master the contents of the discipline better than the students who experienced traditional teaching. They were able to define more precisely what they had learned and give detailed information.
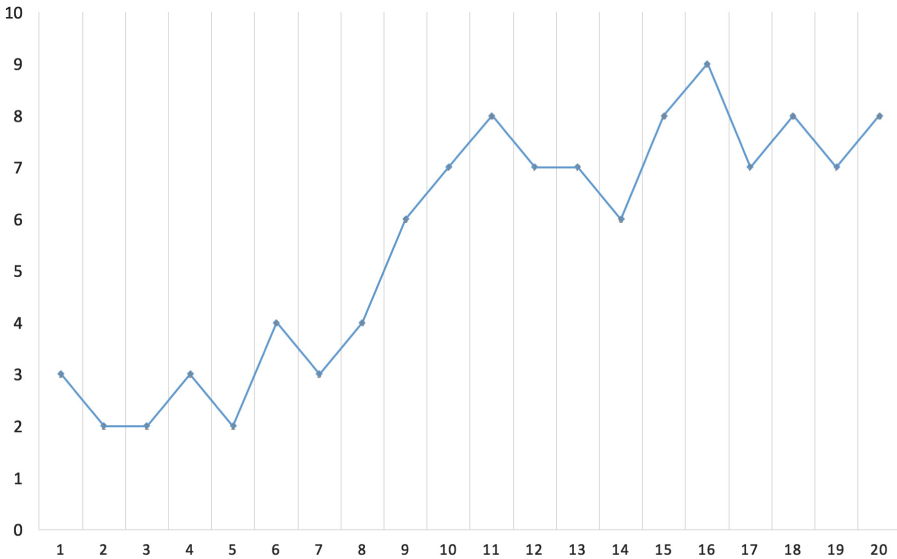
Fig. 1. Average of the students' messages for each week of the project.

Finaly, from the ex-post questionnaire emerged that there was a positive productive students' motivation which was expressed in their selection of more demanding tasks and in their perseverance in improving achievements.

6   Discussion and Conclusions

The communication through the Social Network (Twitter) was perceived positively by the students: the possibility to quickly obtain an answer to their own questions allowed them to dedicate more time to the assigned tasks, without becoming discouraged. This tool discouraged reciprocity (strength), enabling the passage from a dependence on the formal structures to the growth of the Social Network as a learning space. At the same time, the transmission of a 140 character-long message proved demanding generating a risk of leading to an over-simplification of complex debates (weakness). The fluency, the flexibility and the capacity to formulate or answer to a question are important consequences for the students and are a part of their learning process.

Finally, the possibility to formulate questions/answers in writing by assigning one or more tags (hashtags) enabled the creation of a sort of easily-retrievable "information archive" that could be used for future situations.

The insertion of "motivators" in a learning process, as Twitter for instance, yields positive behaviors of the students and generates in them an energy to be dispatched to the learning experiences. Thus, a learning environment may be transformed, from a place where the student is compelled to spend time into a place where students wish to do their best.

Every school might start to use Twitter as an important part of the learning process.

References

1. Ferrari, S., Carlomagno, N., Di Tore, P.A., Di Tore, S., Rivoltella, P.C.: How technologies in the classroom are modifying space and time management in teachers' experience? REM **5**(2), 79–90 (2013)
2. Bell, A.: Exploring Web 2.0: Second Generation Interactive Tools. Kindle edn (2001)
3. Rivoltella, P.C.: Smart Future. Didattica, media digitali e inclusione (2015). (Ed. by, F. Angeli)
4. Hatcher, J., Snowling, M.J., Griffiths, Y.M.: Cognitive assessment of dyslexic students in higher education. Br. J. Educ. Psychol. **72**(03), 119–133 (2002)
5. Reigeluth, C.M., Curtis, R.V.: Learning situation and instructional models. In: Gagné, R.M. (ed.) Instructional Technology: Foundations. Erlbaum, Hillsdale (1947)
6. Gagné, R.M., Driscoll, M.P.: Essentials of Learning for Instruction, 2nd edn. Prentice-Hall, Englewood Cliffs (1988)
7. Spitzer, D.R.: Learning motivation. Educ. Technol. **33**(5), 33–34 (1993)
8. Spitzer, D.R.: Super Motivation. AMACOM Books, New York (1995)
9. Boyd, D., Ellison, N.B.: Social network sites: definition, history, and scholarship. J. Comput. Media. Commun. **13**(1), 210–230 (2007)
10. Ellison, N.B.: Sociality through Social Network Sites. In: Dutton, W.H. (ed.) The Oxford Handbook of Internet Studies, pp. 151–172. Oxford University Press, Oxford (2013)
11. Cesareni, D.: Un linguaggio diverso. Cooperazione Educativa **61**(2), 10–15 (2012)
12. Prensky, M.: Sapiens Digitale: Dagli immigrati digitali e nativi digitali alla saggezza digitale. TD - Tecnologie Didattiche **50**, 17–24 (2010)
13. Selwin, N.: Social Media dell'educazione formale ed informale tra potenzialità e realtà. TD - Tecnologie Didattiche **55**, 4–10 (2010)
14. Small, T.: What the hashtag? A content analysis of Canadian politics on Twitter. Inf. Commun. Soc. **14**(6), 872–895 (2011)
15. Java, A., Song, X., Finin, T., Tseng, B.: Why we Twitter: understanding micro-blogging usage and communities. Paper presented at the Proceedings of the 9th WebKDD and 1st SNA-KDD 2007 Workshop on Web Mining and Social Network Analysis (2007)
16. Ebner, M., Lienhardt, C., Rohs, M., Meyer, I.: Microblogs in higher education - a chance to facilitate informal and process-oriented learning? Comput. Educ. **55**, 92–100 (2010)
17. Della Ventura, M.: Process, project and problem based learning as a strategy for knowledge building in music technology. In: Proceeding of the Multidisciplinary Academic Conference on Education, Teaching and Learning, Prague, Czech Republic (2014)
18. Rivoltella, P.C.: Valutare le attivita on line nella didattica universitaria. Problemi e prospettive. In: Scurati, C. (ed.) E-learning/Universita. Esperienze, analisi, proposte, pp. 39–76, Vita e Pensiero, Milano (2004)
19. Ruggeri, S., Boca, S., Ballor, F.: La valutazione dei processi di formazione a distanza. «TD-Tecnologie didattiche» **25**(1), 29–36 (2002)
20. Ghislandi, P., Raffaghelli, J., Cumer, F.: La qualità dell'eLearning. Un approccio qualitativo per l'analisi dei feedback degli studenti e dei docenti. Ricerche di Pedagogia e Didattca. J. Theor. Res. Educ. **7**(2), 25–47 (2012)
21. Della Ventura, M.: E-learning indicators to improve the effectiveness of the learning process. In: Proceedings of the International Conference on E-Learning in the Workplace (ICELW 2015), New York, USA (2015)
22. Della Ventura, M.: Creating learning environments by means of digital technologies: a case study of the effectiveness of WhatsApp in music education. In: Proceedings of the International Conference on E-Learning, E-Education and Online Training, Dublin, Ireland (2016)