Croatian Journal of Education
Vol.21; No.3/2019, pages: 777-822
Original research paper
Paper submitted: 7th December 2017
Paper accepted: 25th January 2019
https://doi.org/10.15516/cje.v21i3.3013

Effects of Continuous Assessment on the Academic Performance of Future Teachers

Sonia Santoveña-Casal
National University of Distance Education, Department of Didactics, School Organization and Special Didactics, Faculty of Education

Abstract

The aim of this study was to investigate the influence that the assessment system used has on academic performance, taking into account the implementation of an activity based on social networks (Twitter), and the weight of students' perceptions with regard to the improvement of interpersonal relationships and academic progress. The study sample consisted of 519 students studying for a Master's degree in Secondary Education Teacher Training at the National University of Distance Education, Spain (Universidad Nacional de Educación a Distancia): 332 pursued Option A (continuous assessment of task-based learning) and 187 Option B (evaluation of learning based mainly on examination performance). There were significant differences between the students of Option A and those of Option B. In addition, the students who engaged in the Twitter activity performed better in the exam and in the CAT [Continuous Assessment Tasks] compared with the students of Option B. It was concluded that a task-based system of continuous assessment and participation in activity on social networks helped to improve academic performance.

Key words: *formative assessment; perceptions; secondary school teachers; summative assessment; Twitter.*

Introduction

In recent years, a significant effort has been made to design and then implement the European Higher Education Area (EHEA), which has brought about not only structural but also conceptual and methodological changes to university curricula (Romero-López, 2017). In this context, syllabi have been redefined and teaching methodologies reformulated, the aims and activities of learning redesigned and new technologies incorporated into education. Special importance has been given to the

system of assessment, stimulating the implementation of different alternatives for assessing academic performance (Romero-López, 2017; San Martín, Jiménez-Torres, & Sánchez-Beatob, 2015) and highlighting the importance of continuous assessment in the learning process (Delgado & Oliver, 2006; López, 2006). Methodological innovations, required by the EHEA, have encouraged the integration of technologies into the educational process that have been considered effective tools for reinforcing skills (Pedró, 2006) and attention is currently being drawn to the pedagogical potential of social networks (De Pablos, 2007; Durak, 2017), which are being increasingly used by university students (Dahlstrom & Bichsel, 2014), and which not only open up possibilities from a professional point of view, but facilitate the acquisition of new knowledge relating to teaching practice, new methodologies and educational theories (Macià & García, 2016).

Firstly, the starting point is a concept of continuous assessment that differs from the standard assessment in having two complementary aspects, a summative assessment and a formative assessment (Muskin, 2017), and which is considered a fundamental element for ensuring the quality of the teaching. The formative aspect of continuous assessment provides students with information, feedback and advice during the learning process, and the summative assessment provides an insight into their progress (Muskin, 2017), thus facilitating their subsequent accreditation.

Within the process of formative assessment, continuous assessment has a preferential place and is effective provided that it is undertaken on the basis of a planned design and not as a result of a succession of isolated and improvised tests (Arribas, 2012; Delgado, Borge, García, Oliver, & Salomón, 2005). In this context, continuous assessment permits the gradual assimilation of the content by means of communication and interaction with faculty that encourages reinforcement throughout the process (Nicol & Macfarlane-Dick, 2006; Weaver, 2006). In fact, it has been found that continuous assessment has a positive influence on the results of learning (Arribas, 2012; Ebhomien, Oriahi, & Diahi, 2012; Moreno, Ramos, & Salomé, 2017; Samiullah & Anjum, 2017; Zaragoza, Luis-Pascual, & Manrique, 2009). Continuous assessment not only provides the student with feedback, an assessment of strengths and weaknesses of the education and the promotion of studying habits, but it also helps to prevent exams being neglected (Ebhomien et al., 2012). As Fraile, López, Castejón, and Romero (2013) say, continuous formative assessment is not based, in general terms, on taking a final exam and, if one is used, its results will only count for part of the overall grade, since it supplements the marks obtained in continuous assessment activities.

Secondly, it is important to take the potential of social networks into account in the field of education because, as Durak (2017) asserts, their educational potential cannot be ignored. Students at different educational levels (graduate and undergraduate) use them (Karal & Kokoc, 2013) to build communities (Bligh, Ruppel, & Schoenbauer, 2017; Gunawardena, Hermans, Sanchez, Richmond, Bohley, & Tuttle, 2009), albeit of

a temporary nature (Santoveña, 2017; Zappavigna, 2011), to socialise, to keep in touch (Cheung, Chiu, & Lee, 2011; Quan-Haase & Young, 2010; Wodzicki, Schwämmlein, & Moskaliuk, 2012; Yu, Tian, Vogel, & Chi-Wai Kwok, 2010), for voluntary and informal discussions (Kabilan, Ahmad, & Abidin, 2010) and, amongst other things, as a way of expressing their emotions (Greenhow & Robelia, 2009).

Grgić and Mučnjak (2015) say that research into social networks in education has tried to answer a multitude of questions, such as which are best practices and how they should be implemented. The most hotly debated question has probably been whether participating in social networks has a positive influence on students' performance.

There is no shortage of studies claiming that the use of social networks reduces performance or has no impact on learning (Andersson, Hatakka, Grönlund, & Wiklund, 2014; Asterhan & Hever, 2015), particularly when they are used in the classroom, since multitasking reduces performance (Bellur, Nowaka, & Hullb, 2015; Wei, Wang, & Klausner, 2012). They have been considered ineffective spaces for the creation and/or construction of knowledge (Kirschner, 2015), and it has been emphasised that it is important to learn how to manage time spent on social networks to avoid a negative impact on performance (Ahmed & Qazi, 2011), drawing attention to the fact that the more networks are used, the poorer the student's academic performance (Junco, 2012; San Miguel, 2009). There is even research with conclusions that social networks can impoverish their users and bias their opinions and points of view (Carr, 2010; Kirschner, 2015; Ractham & Firpo, 2011) rather than enrich them.

On the other hand, many studies have shown that social media have great potentials for the world of education (Balakrishnan & Gan, 2016; Blazer, 2012; Eid & Al-Jabri, 2017; Veletsianos & Navarrete, 2012), and can be used successfully in this field (Forkosh-Baruch & Hershkovitz, 2012; Goodyear, Casey, & Kirk, 2014; Sobaih, Moustafa, Ghandforoush, & Khan, 2016), revealing a positive relationship between their use and academic performance (Cao, Ajjan, & Hong, 2013; Chai & Fan, 2016; De-Marcos, Garcia-Lopez, & Garcia-Cabot, 2017; Junco, 2012; Khan, Kend, & Robertson, 2016), considering them to be environments where communication, interaction and socialisation can take place (De-Marcos et al., 2017; Sobaih, Moustafa, Ghandforoush, & Khan, 2016), as well as providing a space for exchanging knowledge (Asterhan & Bouton, 2017; Eid & Al-Jabri, 2017) and claiming that, irrespective of the service or software used, they will continue to evolve and exist in order to facilitate communication and learning (Rowland, Craig-Hare, Ault, Ellis, & Bulgren, 2017).

Similar results have been obtained in the case of Twitter: there is a positive relationship between participation in microblogging and students' performance (Hull & Dodd, 2017), provided it is used as a "push" technology (the teacher takes the initiative in the communication, for example by sending information to the student) (Tang & Hew, 2017) or is used within a constructivist paradigm (Desselle, 2017). Many authors have seen Twitter as a means of reinforcing students' commitment and involvement (Jones & Baltzersen, 2017; Junco, Heibergert, & Loken, 2010; Liu, Chen,

& Tai, 2017; Tur & Marin, 2015), as a tool for exchanging information (Veletsianos & Navarrete, 2012 amongst others), as a medium that facilitates communication, both formal (Dabbagh & Kitsantas, 2011) and informal, between students (Tang & Hew, 2017) in educational environments, very often facilitating the creation of groups or communities (Bligh et al., 2017; Carpenter & Krutka, 2015). The processes of social interaction and the patterns of exchanging information that can be developed using Twitter have a positive influence in the sense of generating a community amongst the students (Bligh et al., 2017). In addition, there is no shortage of research that emphasises the value of Twitter as a space that reinforces the interaction between teachers and students (Preston, Jakubiec, Jones, & Earl, 2015). Carpenter and Krutka (2015) say that teachers like Twitter for the opportunities it opens up for professional development, its immediacy, its interactive potential and usability. In fact, teachers use Twitter to share experiences, reflect, debate and share educational resources (Davis, 2015; Wesely, 2013).

Finally, it should be emphasised that students' experience of the learning process is a fundamental element to be taken into account (Ginns & Ellis, 2009). It has been found that students' positive perceptions in relation to various elements of the learning and teaching process can predict the results of learning (Crawford, Gordon, Nicholas, & Prosser, 1998; Lizzio, Wilson, & Simons, 2010; Lopez-Perez, Perez-Lopez, & Rodriguez-Ariza, 2011; Marinović, 2014; Owston, York, & Murtha, 2013; Ramsden, 1983; Richardson, 2003; Ullah & Yasmeen, 2017). A great many aspects have been analysed. A significant relationship has been established between perceptions, academic motivation, learning preferences and approaches to study (Richardson, 2003; Ullah & Yasmeen, 2017), the perceived relevance of the courses (Ramsden, 1983) and different elements of the learning environment (workload, assessment and learning resources, etc.) (Lizzio et al., 2010; Ullah & Yasmeen, 2017) and academic performance. It has also been found that people who perceive that they are going to do things well tend to work harder, are more persistent and function better (Pintrich, 2003), since positive perceptions of the learning experience, apart from improving grades, can reduce student drop-out rates (Lopez-Perez et al., 2011) and that students who have a more positive perception of a blended learning course (attractiveness, suitability, satisfaction) do better than those with more negative perceptions (Owston et al., 2013).

In short, the research presented in this article is based on the importance of the continuous assessment system used for academic performance, taking into account the impact of implementing an activity based on social networks (Twitter), and the weight of students' perceptions of improvement in interpersonal relationships and improved academic progress. The study has been undertaken in the context of the course on *Design and development of the curriculum,* in the *University Master's Degree in teacher training for compulsory secondary education and baccalaureate, professional training and language teaching of the Spanish National Distance Education University* (Universidad Nacional de Educación a Distancia, UNED).

The Aim and Significance of the Study

The main contributions of the research presented in this article to the field of study are felt to be the study sample, the objective and the research method.

In recent years UNED, the only public distance education university in Spain, has designed and rolled out a set of EHEA-compliant degrees. At the UNED School of Education, the university master's degree in teacher training for compulsory secondary education (a mandatory requirement for teachers of compulsory secondary education and baccalaureate, professional training and language) is one of the principal pillars. Seven years after the degree's introduction, it is now felt to be both necessary and advantageous to analyse the efficacy of the new teaching methodologies implemented in one of the compulsory core courses for all master's degree students: Design and development of the curriculum. This sample offers a significant look at the data involved.

Furthermore, the object of study is the analysis of the interaction of four aspects considered fundamental by the EHEA: the continuous evaluation system, learning activities, the integration of technologies into the education process and the possible pedagogical potential of social networks. Therefore, the research seeks to analyse the influence of different variables on academic performance, and it does so by integrating several variables that are highlighted by several researchers as meaningful. Not only does the research take into account the continuous evaluation process as an element of teaching methodology – as have other researchers, such as Moreno, Ramos, and Salomé (2017) – and student experience in connection with the learning process – as did Marinović (2014) and Ullah and Yasmeen (2017); it also includes social networks, one of the most innovative elements regarded in the latest research (such as Liu, Chen, & Tai, 2017; Tang & Hew, 2017), in an attempt to contribute to the study of networks' influence on and educational potential for academic performance, as this is regarded as one of the hottest issues in current research (Grgić & Mučnjak, 2015), and is therefore especially meaningful.

Lastly, the combined quantitative/qualitative research method used in this study is felt to be especially important. The combination of the two methods enhances the quality of the research process (Johnson, Onwuegbuzie, & Turner, 2007). A descriptive analysis and a relational analysis were performed, and students' answers in an end-of-semester report on Twitter activity were subjected to content analysis. Both focuses help study academic performance and Twitter participation.

In short, the aim of this study was to investigate the influence of the type of system used to assess academic performance, taking into account the implementation of an activity based on social networks (Twitter), and the weight of students' perceptions of interpersonal relationships generated and academic progress.

The specific aims of the study are the following:

1. Analyse the academic performance according to the learning continuous assessment alternative chosen by the students.

2. Study the participation on Twitter (number of tweets, links, retweets, and reply @s) throughout the academic year.
3. Examine the relation between the participation on Twitter and academic performance.
4. Analyse the relation between the participation on Twitter to the improvement of interpersonal relationships and/or the creation of a community with shared interests.
5. Examine the connection between a positive perception of participation on Twitter (tweets, retweets, etc.) with academic performance.

Instructional Design of the Subject

The *Design and development of the curriculum* is a compulsory subject taught in the second semester, and is therefore common to all students of the *University Master's Degree in teacher training for compulsory secondary education and baccalaureate, vocational training and language teaching of the Spanish National Distance Education University (UNED)*. This master's degree must be obtained in order to work as a teacher in compulsory secondary education and baccalaureate, vocational training and languages in Spain.

The subject meets the requirements of the EHEA (competence learning model) and is adapted to the UNED teaching model, a distance education model. The teaching team has been responsible for designing the subject based on expected skills and learning outcomes, seeking coherence between the various elements of the curriculum, goals, didactic materials, evaluation system (sitting an exam and Continuous Assessment Tasks (CATs)), among others. The didactic materials (basic and complementary) were selected and developed on the basis of the skills and learning outcomes sought. All the information on the subject is included in the didactic guides (work plan and general information guide) that seek to help the student learn independently. The teaching team works in coordination with 6 teacher-tutors, who participate in the subject by means of on-line tutorials. Their main function is to work with the teaching team by moderating the forums and correcting the CATs.

The *on-line course* is the main space for communication and interaction, where the teaching team, the teacher-tutor and the students meet. All the materials, complementary reading materials, video tutorials and didactic guides necessary for studying the material, are digitised and located in the on-line course. The principal medium of communication is the discussion forums that can be considered centres for communication, interaction and discussion. It is not the purpose of this article to analyse participation in this tool in detail, simply to mention that more than 1,427 messages were sent through the 9 forums (students, general queries, a forum for each topic and activity, and a forum for raising queries relating to the exam). Each teacher focuses on a forum regarding a particular topic and a specific activity, providing support for students and monitoring their progress.

A formative and summative assessment model has been used to evaluate the learning process. *Formative assessment* is carried out during the learning process (progressive and continuous) and provides guidance, regulation of learning and student motivation. Throughout the semester, the faculty provides follow-up and support for taking the CATs, resolving doubts and providing students with guidance to help them achieve their academic goals and analyse the progress made in the activities. On the other hand, the summative assessment is carried out at the end of the course for the purposes of integration, advancement and accreditation. It is the result of the grades obtained in the exam taken in person and in the continuous assessment activities. Each part counts for 50% of the final grade. To pass the CAT (Option A) a minimum grade must be obtained in each of the activities. The final grade for the CAT is out of 10 marks. In order to ensure that the teaching and learning process is adapted to the students, two modalities or itineraries are proposed for the subject. Students can choose between the following two options:

a) Option A. Evaluation of learning based mainly on continuous assessment: Completion of the 4 compulsory activities plus the "Type A" exam, which is sat in person. This exam consists of answering an essay question on topic 6 "Evidence of learning".

b) Option B. Evidence of learning based mainly on taking the exam: Completion of an activity to be chosen from the 4 offered plus sitting the "type B" exam in person. This exam covers the complete syllabus for the subject and consists of five brief questions. There is no participation in Twitter activity.

In both options (A and B) the same competences are evaluated. The contents are selected based on the competences and learning outcomes of the subject. In both options the same contents are taught, the only difference between option A and option B is the teaching methodology used, therefore, it can be affirmed that all students acquire the same competences.

The activities proposed were the following:

Activity 1. Personal vocabulary

- Objective: To develop a personal vocabulary by selecting at least 4 specific concepts from topic 1 (Didactics and curriculum) and topic 2 (Designing the curriculum and planning) for study that, in the student's opinion, might best express the specific content of said topics.
- Worth 2 marks.
- Minimum marks necessary to pass the activity: 1

Activity 2. Conceptual map

- Objective: To create a conceptual map of the content set out in the document on topic 3: Formative processes in the classroom: Teaching-learning strategies.
- Worth 2 marks.
- Minimum marks necessary to pass the activity: 1

Activity 3. Social networks

- Objective: To introduce students to the use of social networks and their application and adaptation to the field of the student's educational speciality. The topic of publishing on social networks is related with didactic experiences and/or research undertaken which mainly examines the application of social networks in the classroom. That is, the student should exchange information and opinions relating to resources, publications, web spaces, etc. which deal with and describe teaching experiences using social networks with students, within the area of their speciality.
- Related with Topic 4. Network literacy processes in Secondary school classrooms.
- Worth 3 marks.
- Minimum marks necessary to pass the activity: 1.5

Activity 4. Selection of materials

- Related to Topic 5. Selection of curricular materials. Selection, evaluation and preparation of a report on the suitability of the didactic material to be used in the student's speciality.
- Worth 3 marks.
- Minimum marks necessary to pass the activity: 1.5

In short, the subject has been designed with the objective of integrating the theoretical and practical aspects studied. Furthermore, the objective of the continuous assessment Tasks is to facilitate the acquisition of knowledge and reinforce the theoretical study of the materials. The activities plan for the subject aims to reinforce learning and serve as an instrument for reflection and theoretical/practical application of the content.

Methods

Research Aims and Hypotheses

The aim of this study was to investigate the influence of the type of assessment system used on academic performance, taking into account the implementation of an activity based on social networks (Twitter), and the weight of students' perceptions of interpersonal relationships generated and academic progress. In order to achieve this aim, the following hypotheses were proposed:

H1. The academic performance of students who follow the task-based learning continuous assessment alternative (Option A) will be better than that of students who have chosen assessment based mainly on performance in the exam (Option B).

H2. Participation on Twitter will have a positive impact on students' performance.

H3. Students who have perceived that participating on Twitter improves their interpersonal relationships and/or the creation of a community with shared interests will perform better academically.

H4. Students who have perceived that participating on Twitter helps them acquire knowledge and/or academic training will perform better academically.

Research Sample

The population consisted of 634 students enrolled in the course *Design and development of the curriculum*, as part of the *University Master's degree in teacher training for compulsory secondary education and baccalaureate, professional training and language teaching of the Spanish National Distance Education University* (UNED), in the 2016-17 academic year. The sample was made up of 519 students who sat the exam in person and carried out the continuous assessment activities (CAT): 332 chose Option A and 187 Option B. The sampling error is found on the basis of simple random sampling in the most unfavourable case of the sample (p=q= 0.5) for a confidence interval of 95%, which shows a sampling error of 1.8% for the study of performance that is based on a comparison between the results obtained by both groups of students and 3.7% for the study based on the students who performed the Twitter CAT (CAT_TW) (Table 1).

Table 1

Sample

	Option A	Option B	Total	Sampling error
Academic performance study	332	187	519	1.80%
Twitter participation study (PEC_TW)	332	0	332	3.70%

Research Design and Instruments

The research was based on a mixed, quantitative and qualitative design. On the one hand, a descriptive analysis and a relational analysis were carried out, using Student's *t*-test, one-factor ANOVA and Spearman's relational analysis. On the other hand, a content analysis of the students' answers was carried out in the report on the Twitter activity, requested at the end of the semester. Data were analysed using three main software programs: Excel for organising the data, SPSS Statistics version 22 for the statistical analysis, and Atlas.ti HM for analysing content. In the report on the Twitter activity, students had to include the data of their Twitter account and, in this way, the verification of their identity was guaranteed.

Firstly, in order to study performance on the basis of the option (A or B) selected by the student, the lists of students' exam results and continuous assessment tasks (CATs) were used as instruments for collecting data. A relational study of means was performed with the Student's t-statistic to compare the performance of the students who chose option A and those who chose option B, with the support of the Mann-Whitney nonparametric U test. Spearman's correlation analysis was later carried out between the marks obtained in the CAT and the marks obtained in the exam.

Secondly, to analyse participation on Twitter, Twitter's application programming interface (API) and Google TAGS v6 spreadsheet (Hawksey, 2013) were used to compile the messages published on Twitter and, in addition, on 16 October 2017, students' Twitter accounts were accessed to record their activity in terms of number of tweets, followers, senders followed and the like.

In order to track Twitter activity continuously, from March to June 2017, we downloaded the Twitter data using the Google TAGS v6 spreadsheet (Hawksey, 2013), to group them by months. A descriptive analysis of the participation data and a relational study were carried out to uncover differences in performance: Student's t-test to compare the performance in the Twitter CAT and option B students, contrasting the data with the Mann-Whitney U-test data, and a Spearman correlation analysis between the marks obtained in the Twitter CATs and the marks obtained in the exam.

Thirdly, to study students' perception of the influence of the Twitter experience on performance, information was compiled from the report they were asked to submit at the end of the semester. The information obtained was as follows:

1. Evaluation of the Twitter experience: Positive; Very positive; Negative or Neutral. Justify your answer.
2. Has engaging in the activity affected your relationship with your fellow students? Positive or very positive; Negative or no influence; Don't know, no reply. Justify your answer.
3. Have you formed a learning community or group with shared interests? Yes; No; Don't know, no reply. Justify your answer.
4. Have you acquired knowledge with the activity? Yes; No. Justify your answer.
5. What kind of knowledge has the activity helped you acquire? Theoretical; Practical; Both (Theoretical-practical). Justify your answer.
6. Do you think it has improved your general training and/or the specific training related with the material? Yes, general training; Yes, general and specific training; It has not influenced academic training. Justify your answer.

A descriptive analysis was carried out and then an ANOVA analysis of a factor in order to determine the difference in performance taking into account the following variables: Network of contacts; Community of shared interests; Type of knowledge acquired; Academic training. Tukey and Bonferroni's HSD was used to analyse the differences between pairs of means.

Subsequently, the open-ended answers on the type of knowledge acquired and the influence of the activity on general and specific training were analysed using Atlas.ti software. The content analysis follows indications from García-Llamas, González, and Ballesteros (2001, p. 1) defining the content and sample selection; 2) deciding on the unit of analysis and establishing the categories. Three main categories were extracted:

– Practical knowledge: Handling; Tools,
– Specific knowledge: Speciality; Material,
– General knowledge: Conceptual; Cognitive; Application in the classroom.

The results of the code categorization are presented in a concept map, indicating their materialization (frequency of appearance) and density (number of codes that relate to each other). In addition, we include the literal text of the students' comments

that were used, indicating the number of the main document of analysis and the line from which the comment is taken.

Procedure

The procedure was developed in the course of the 2016-17 academic year:

- Phase I. October to December 2016. Design of the subject, the continuous assessment process and design of didactic activities.
- Phase II. From February to May 2017 the instructional process was developed, and the activities started.
- Phase III. From March to June 2017. Progressive (weekly) extraction of Twitter data using the Twitter and Google TAGS spreadsheet v6 application program interface (API) (Hawksey, 2013).
- Phase IV. May to June 2017 submission and evaluation of the reports on the ordinary examination session.
- Phase V. September 2017 submission and evaluation of the reports on the special examination session.
- Phase VI. October 2017. Extraction of data from the Twitter accounts (tweets, likes, followers, senders followed).
- Phase VII. October 2017: Analysis of data and extraction of conclusions.

Results

The results of the research are shown in three subsections that relate to the four hypotheses proposed in the study.

Firstly, the influence of the assessment options chosen by the student (Option A or B) on performance was analysed in order to test 1. Secondly, participation on Twitter and its influence on performance was analysed to confirm or disprove *hypothesis 2*. The third subsection presents the results obtained from the perceptions of the students who participated on Twitter in relation to the improvement of their interpersonal relationships and academic training, with the aim of confirming or disproving *hypotheses 3 and 4*.

Assessment System: Option A and Option B

Depending on the type of assessment system chosen by the student, it was found that students who chose Option A (continuous assessment of task-based learning) obtained higher marks in the CAT and in the exam than those who only followed option B (assessment of learning based mainly on taking the exam). The sample data, according to the *t* statistic, revealed that the difference between the two samples was significant for the CAT [F (46.62) t = 2.013, Sig. (Bilateral) = .045] and the examination [F (0.237) t = 3.325, Sig. (Bilateral) = .001]. Furthermore, these significant differences were also reflected in the final grade obtained for the subject. In view of the abnormal distribution of the variables in the sample, and to confirm the *Student's t* data, the *Mann-Whitney U* was found for these variables. It was confirmed that significant

differences existed compared with the exam and for the final grade obtained in the subject, but not for the CAT score (Table 2).

Table 2

Academic performance Option A and Option B. Test statistics[a]

	CAT	EX	FINAL
Mann-Whitney U	30257.00	25314.00	25688.00
Wilcoxon W	47835.00	42892.00	43266.00
Z	-.48	-3,53	-3.31
Asymptotic sig. (bilateral)	.630	.000	.001

a. Grouping variable: OPTION

On the other hand, a significant *Spearman* correlation of 0.05 was found at a bilateral level between the score obtained in the CAT and the grade for the exam.

Participation on Twitter

Students participated on the social network for 3 weeks, at the student's choice within the months of February, March, April and May of 2017. During this period the students actively participated by sending at least 50 messages, at daily intervals, or every 2 days. At least 20 messages were direct and the remaining 30 messages were the result of retweeting, citing and responding to messages from other students. The analysis of the students' accounts indicated that they had, on average, 195.87 accounts, which they follow, and an average of 153.20 followers, 171.08 tweets and 142.41 likes.

Taking into account all the students in the Twitter activity, whether students of option A or B, the record of messages sent during the academic year showed a progressive and constant increase in the four main indicators (number of retweets, links, messages with @identifier and tweets) (Figure 1). Most of the messages contained a link (61.5%), 20.3% were retweets and 33.6% contained @identifier.

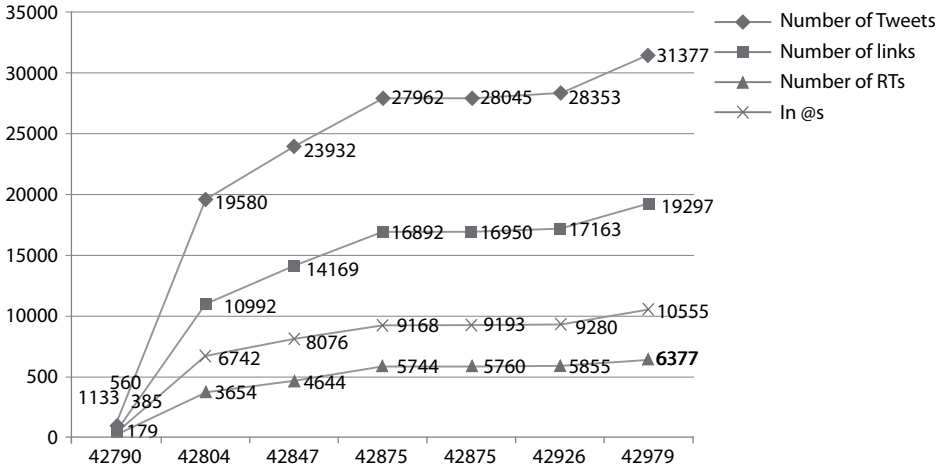


Figure 1. Messages sent via Twitter with the #D17_UNED (RT, Links, Tweets)

Most of the students (91.87%) considered the experience obtained on Twitter to be positive (62.05%) or very positive (29.82%). A small percentage (7.23%) considered the experience to be neither positive nor negative while only 2 students (0.60%) found it to be negative.

With regard to performance, the results show that the students' performance was better in the Twitter activity than the other Option A activities: Activity 1. Personal vocabulary (M = 8.41); Activity 2. Conceptual map (M = 8.22); Activity 3. Social Networks (M = 8.52), and Activity 4. Evaluation of didactic material (M = 8.36). Furthermore, an analysis of students' performance in the Twitter activity and that of students in Option B showed that the students who took part in the Twitter activity performed better in the exam (M = 6.9) and in the CAT (M = 8.5) (Table 3).

Table 3

Academic performance (Option A, Option B and Twitter activity)

	OPTION	N	Mean
CAT	A	332	8.37
	B	187	8.05
	Twitter	332	8.52
EXAM	A	332	6.90
	B	187	6.40
	Twitter	332	6.90
FINAL	A	332	7.55
	B	187	7.10
	Twitter	332	7.55

Significant differences were found between the two tests, performance in CAT and in the exam, for students who took part in Twitter and those that chose Option B: CAT [F (26.918) t= 2.899, Sig. (bilateral)= .004] and Exam [F (.237) t= 3.350, Sig. (bilateral)= .003], which were confirmed using the Mann-Whitney U statistic (Table 4).

Table 4

Academic performance Twitter activity and Option B: Test statistics[a]

	PEC	EX	FINAL
Mann-Whitney U	27670.00	25314.00	25688.00
Wilcoxon W	45248.00	42892.00	43266.00
Z	-2.09	-3.53	-3.31
Asymptotic sig. (bilateral)	.036	.000	.001
a. Grouping variable: Participation on TW and OPTION B			

Perceptions of the Influence of Twitter on Interpersonal and Academic Improvement

Firstly, in relation to the perception that engaging in the Twitter activity influenced their interpersonal relations within the educational community, two aspects were

analysed: its influence on the network of contacts, and on generating a community or group of shared interests.

There were 94.28% students who valued the influence of participating in Twitter in generating a network of contacts as positive or very positive. Only 3.31% considered its influence as negative or non-existent, and 2.41% did not answer the question. On the other hand, 71.39% of students felt that the activity helped them generate a community or group with shared interests. Only 14.46% said that no community has been generated while 14.16% did not know or did not answer the question explicitly.

Students who evaluated the influence of the activity on their relationships with other students positively or very positively performed better in the CATs and in the exam than those who considered it negative or having no effect (Table 5). Significant differences were found, using analysis of variance (ANOVA), in relation to performance in the CAT, but not in relation to the exam. These differences are significant with F (3.850) and a significance value of .022. The Tukey and Bonferroni HSD tests revealed that the significant differences were between the "positive or very positive" and "negative" evaluations, with 0.018 (Tukey HSD) and 0.019 (Bonferroni).

Table 5

Perception of the influence of the activity on relations established with fellow students

	CAT_TW	EXAM
Don't know/No answer	8.73	6.25
Positive or very positive	8.55	6.83
Negative or non-existent	7.37	6.32

In addition, those students who claimed to have created a community or group with shared interests performed better in both tests (Table 6), but there were no significant differences.

Table 6

Perception of generating a community or group of shared interests and performance

	CAT_TW	EX
Don't know/Didn't answer	8.41	6.5
Yes	8.54	6.86
No	8.48	6.77

Secondly, in relation to the perception that engaging in a Twitter activity influenced academic improvement, two aspects were analysed: the perception of acquiring academic knowledge and improvement in their general and/or specific training.

The results show that 97% of the students considered that knowledge was acquired through the activity and most of the students (85.54%) said that the type of knowledge acquired was theoretical-practical. Only 12% said that it was exclusively practical and 2.4% that it was mainly theoretical.

Students who stated that they acquired theoretical-practical knowledge performed better in the CAT, without significant differences being found. However, students who considered that the knowledge they acquired was mainly theoretical, performed better on the exam (Table 7), with significant differences compared with the other two groups (practical and theoretical-practical) [F = 4.132, Sig. = .017]. The *Tukey HSD* tests reveal that the significant differences were between "theoretical" and "practical" (Sig. = .045) and between "practical" and "both" (Sig. = .046).

Table 7

Type of knowledge acquired and academic performance

Type of Knowledge		CAT	EX
Theoretical	Mean	8.54	7.69
	Standard deviation	1.41	1.96
Practical	Mean	8.13	6.21
	Standard deviation	1.64	1.83
Both	Mean	8.57	6.85
	Standard deviation	1.37	1.54

On the other hand, it was found that most of the students (99.10%) claimed engaging in Twitter activity resulted in an improvement in their general and/or specific training. More than half (55.29%) considered that the activity made a positive contribution to their general and specific training (related to the subject, to other subjects in the master's degree and/or to the student's speciality), as well as helping in the acquisition of general knowledge related with Twitter. There were 43.81% of students who stated that the activity had contributed to their general education (related to the use and integration of the social networks into the classroom, and also knowledge related with designing activities within the framework of the curriculum). Only 3 students said that it had not contributed to their training.

The ANOVA analysis did not reveal significant differences between performance in the exam according to the type of general and/or specific training they considered they had acquired.

Finally, the content of the answers concerning the type of knowledge acquired and the activity's influence on their general and specific training was analysed. Three main categories were extracted (Figure 2):

– Practical knowledge: Approach; Tools,
– Specific knowledge: Speciality; Material,
– General knowledge: Conceptual; Cognitive; Application in the classroom.

The three categories are interrelated through the concept of learning. They do not constitute sealed categories.

In the category Practical knowledge, two subcategories are included: management of the Twitter and practical knowledge of resources and online tools. Practical knowledge is directly connected to the learning of the use of these resources and tools in the

classroom. Another connection to note is the acquisition of communication skills, which are both practical knowledge (learn to communicate with Twitter) and general knowledge useful in students' profession (learn to discuss in group).

The second category General knowledge refers to the knowledge acquired, without necessarily constituting a specific academic goal, but it is very useful for career development as teachers. This category is divided into three subcategories:

– conceptual knowledge: acquisition of general concepts about society, technology and social networks,
– cognitive: acquisition of cognitive skills, relating to summarizing, reflecting and debating,
– knowledge related to the application in the classroom which, on the one hand, is practical learning and, on the other, it connects with learning resources and useful tools to use in the classroom.

Finally, Specific knowledge refers to the acquisition of content related to the specialty and the subject: academic and professional knowledge.

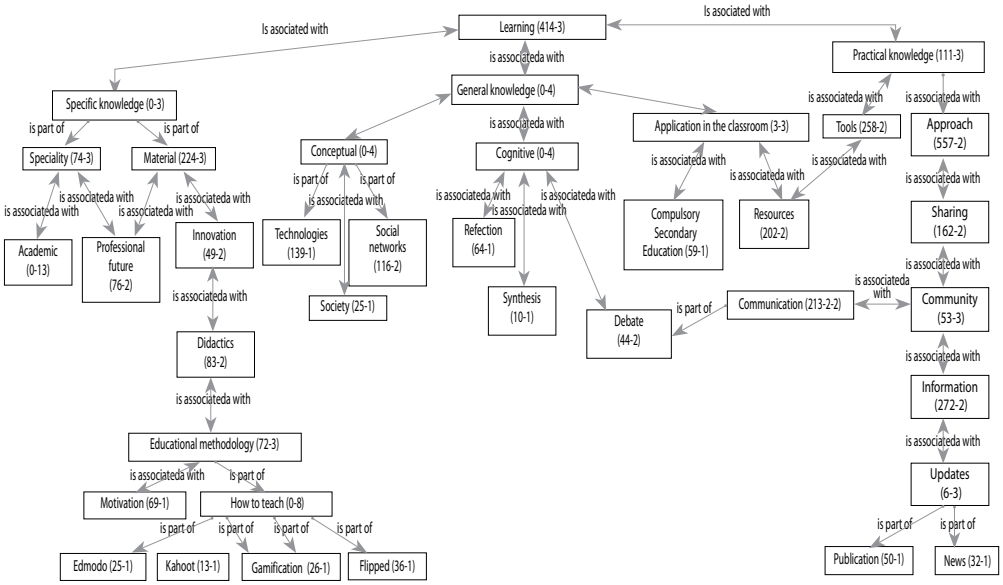


Figure 2. Conceptual: Type of knowledge acquired and improvement in academic training

The students identified three types of knowledge acquired through participation on Twitter: specific, general and practical.

Firstly, students said they had acquired specific knowledge directly related, on one hand, with the academic speciality of the Master's degree the student was studying for (Economics and Business Administration, Philosophy, Physics and Chemistry, Geography and History; IT, Spanish Language and Literature, French, English, Italian, amongst others) and, on the other, with the specific knowledge associated

with the Design and development of the curriculum material, knowledge related with innovative approaches to classroom teaching, specific didactic methodologies that showed them how to motivate and how to teach using the support of social networks (edmodo, Twitter, etc.), gamification and, among other things, by using blended learning methodologies such as Flipped Classroom. Both types of knowledge (speciality and subject) were helpful for the student's professional future. The opinion of student 296 summarises these ideas:

> "At the same time, and given the nature of the activity, I have acquired different types of theoretical knowledge not only (...) about the subject but with the Twitter task, since many of the entries that I have been publishing on didactics and pedagogy have been doubly useful by sharing knowledge through my own learning. In this respect, reflections on pupils' motivational issues, on the role of teachers, on aspects of using Twitter and even theoretical content for teaching Latin have been very relevant" (S296).

Secondly, students' assessment of the acquisition of general knowledge associated with different aspects is worth noting: the acquisition of conceptual aspects (of social networks, society and technologies), the application of social networks in the secondary school classroom via various didactic resources available on the network ["The activity has allowed me to develop a deep knowledge of the integration of ICTs into education (...) I have learned (...) how to develop an innovative activity based on ICTs" (S289)] and, with the development of cognitive skills, such as reflecting, synthesising ideas and debating, integrating different perspectives. ["(...) The importance of knowing how to select, contrast and filter the immense amount of information available on the Internet stands out, skills I have been able to put into practice and improve with this activity (...)" (S283)]

Finally, students evaluated the acquisition of practical knowledge related to the development of practical skills, such as how to use digital tools and resources, and that relating specifically to exploiting the Twitter social network. Students emphasised that they had learned to interact, communicate, participate, share and exchange information through Twitter, allowing them to generate a community with common interests. The process of communication allowed them to interact, get to know each other, establish ties, improving their perception of the group, and exchanging information helped them keep up to date by searching for and subsequently publishing different types of documents and news, as well as by reading and consulting messages posted by other students. The opinion of student 96 summarises these ideas:

> "(…) we have acquired knowledge about social networks, because before this activity we only used Twitter to follow people that interested us to analyse their tweets, but now we have expanded the possibilities of this Social Network and have shared content, "liked" publications that we have found interesting, retweeted other users' tweets that we wanted to share from our profile, we have

created lists or communities of people with the same interests, and we have even used the famous hashtags to group all the information related to a specific topic and facilitate the search for content" (S96).

Discussion

The purpose of this study was to investigate the influence of the type of assessment system used on academic performance, considering the implementation of an activity based on social networks (Twitter), as well as the weight of students' perceptions of the relationships generated and academic progress.

In the first place, as in other studies (Arribas, 2012; Ebhomien et al., 2012; Moreno, et al., 2017; Samiullah & Anjum, 2017; Zaragoza et al., 2009), we have concluded that continuous assessment improves learning outcomes.

In Option A, the learning process was based on pursuing four activities relating to the first four topics of the pedagogical syllabus and also taking an exam on a single topic in the syllabus (topic 6). Therefore, most of the topics in the subject were assessed through engaging in activities. In contrast, in Option B, the students only engaged in a single activity (to be chosen from the four offered) and answered questions on all the topics in the syllabus in the exam. Most of the time they devoted to learning was spent studying the syllabus, focussing on taking an exam consisting of essay questions.

On the one hand, it was concluded that continuous assessment should focus on the two aspects highlighted by Muskin (2017), formative and summative assessment. As Nicol and Macfarlane-Dick (2006) and Weaver (2006) stated, continuous assessment encourages progressive learning and gradual assimilation of the content, provided that the teacher reinforces the student's learning during the process. In the subject Design and development of the curriculum, the teachers and tutors provided follow up and support for taking the CATs, answering queries and providing the students with guidance in order to help them achieve their goals and make progress in learning (formative assessment). In addition, the assessment of performance considered the exam results, which counted for only part of the final grade, complementing the marks obtained in the activities and continuous assessment, an aspect which Fraile, López, Castejón, and Romero (2013) highlight as essential for effective continuous assessment. In short, the final summative assessment combines the grade obtained in the exam with the marks obtained by participating in the activities, each of which counts for 50%, facilitating students' accreditation and subsequent advancement.

On the other hand, as several authors have said (Arribas, 2012; Delgado et al., 2005), a continuous assessment process will only be effective if it is adopted on the basis of a planned design and not as a result of the succession of isolated and improvised tests. For this reason, another of the aspects considered responsible for the success of the continuous assessment process is the instructional design of the subject, since it was organised in a coherent manner and in advance, and planned based on the academic timetable, the subject content, and the learning objectives.

Secondly, in relation to the influence of Twitter activity on performance, the results were similar to those found in other research: there was a positive relationship between participation in microblogging and student performance (Hull & Dodd, 2017).

As Durak (2017) says, the educational potential of social networks cannot be ignored. It is possible that when students take part in this activity, its influence on performance in the exam may be due to the motivational value and satisfaction displayed by students when they participate on Twitter. Students considered the experience positive, not only from an academic point of view, for acquiring theoretical-practical knowledge, but also as a way of developing their interpersonal relationships with fellow students and creating a community with shared interests. The results obtained by other scholars are therefore confirmed: students positively evaluated the use of Twitter as a space that facilitates the generation of a community (Bligh et al., 2017; Carpenter & Krutka, 2015; Gunawardena et al., 2009), as a tool for information exchange (among others, Veletsianos & Navarrete, 2012) and as a means to socialise and communicate (Cheung et al., 2011; Dabbagh & Kitsantas, 2011; Kabilan et al., 2010; Quan-Haase & Young, 2010; Tang & Hew, 2017; Wodzicki et al., 2012; Yu et al., 2010).

It can be concluded that the motivation and satisfaction obtained by participating on Twitter can be a mediating variable that reinforces higher performance. This opens new avenues of analysis that may confirm or refute the findings of this research. It would be interesting to continue the research in order to analyse the effect of participating on Twitter as a way of reinforcing student commitment and involvement, as various authors have done (Junco et al., 2010; Jones & Baltzersen, 2017; Liu et al., 2017; Tur & Marin, 2015) or, as analysed by Santoveña (2017) and Zappavigna (2011), to study the stability of the communities generated, or to determine the value of participating in the network as a way of expressing their emotions, as Greenhow and Robelia (2009) have done.

Thirdly, it was found that students considered that participating on Twitter had a direct positive impact on interpersonal relationships, generating a community with shared interests and improving academic performance in terms of acquiring knowledge and improving general and/or specific training. However, it was concluded that students' positive perceptions (interpersonal and academic) do not significantly influence performance.

It should be added in this conclusion that the positive perception of improved academic performance (knowledge acquisition and general and/or specific training) and relations with the other students, together with the perception of a community or group of shared interests, could be considered a motivational variable and facilitator of performance to be taken into account when designing didactic activities, since those students who perceive these variables to have a positive influence on performance obtain better results in the Twitter CAT and in the exam. One could say there is a certain tendency for a positive (interpersonal and academic) perception to improve

performance, and that this is a variable that should be taken into account as a predictor of learning outcomes, as found in other current research (Lopez- Perez et al., 2011; Marinović, 2014; Owston et al., 2013; Ullah & Yasmeen, 2017). Further studies will be necessary to confirm this trend.

Students emphasise the possibility of accessing news, resources and content related with their speciality, with the topics covered in the subject and with content related to the application of ICT in the classroom. Furthermore, it was found that students who consider that the knowledge acquired was mainly theoretical performed better in the exam, with significant differences compared with the other two groups (practical and theoretical-practical). Students who valued the acquisition of theoretical knowledge probably devoted more time to reading and reviewing the content obtained from the messages sent by their fellow students, and from the tweets themselves. This would lead to these students performing better academically compared with students who valued the acquisition of predominantly practical knowledge, whose approach to participation on Twitter would have been more pragmatic and less reflective. It was concluded that it is possible to acquire knowledge through Twitter but the effectiveness of this method depends on the student's attitude to the task, and also the instructional design of the didactic activity.

One of the most noteworthy aspects of the students was their positive assessment of the Twitter activity and the various possibilities it offered them as future teachers. The opinion of the student 105 (S105) summarises the added value offered by social networks in the field of education:

> "(…) I have been pleasantly surprised by what I have been able to learn using the Twitter social network. When I embarked on this activity, I was rather sceptical and didn't really think it would help me much as a future teacher. However, it has taught me many techniques and I have been able to see many ideas about ways of using social networks that can be implemented in the classroom. I have discovered many ways of using these tools in English classes (…)" (S105)

For the 2017-18 academic year the subject's teaching team will implement exclusively a continuous assessment system based on learning through activities; that is, students will be offered only Option A, since it is considered more effective from the learning point of view. They will continue to be offered different kinds of activities, but all of them will involve participation on Twitter in their final phase, as this is considered a motivational environment that can reinforce students' academic commitment, as Jones and Baltzersen (2017) assert, informal and/or formal communication, as recent research (Dabbagh & Kitsantas, 2011; Tang & Hew, 2017) has found, and interaction between faculty and students, as Preston et al. (2015) found. The activity will be designed on the basis of the "push" technology described by Tang and Hew (2017), the teacher initiating communication by sending questions and discussion topics that encourage the process of reflection and debate through the Twitter network. Raising

questions for reflection and debate through microblogging, together with exchanging resources and news can construct a didactic approach that allows different types of learning to develop.

In short, formative assessment fulfilled the functions of guidance, regulating learning and motivating students throughout the semester whereas summative assessment helped to provide integration, advancement and accreditation, and the two together implemented a successful process of continuous assessment that, together with social networks, helped students learn.

Conclusions

Hypothesis 1 is confirmed: the academic performance of students who chose the task-based learning continuous assessment alternative (Option A) performed better academically than students who chose the assessment Option based mainly on exam performance (Option B). Hypothesis 2, that participating on Twitter has a positive impact on student performance, can also be confirmed, although the nature of this connection and the degree of impact needs to be analysed in further studies since no significant Spearman correlation was obtained between the marks obtained in the Twitter CAT and those of the exam. Therefore, because of these results, it was concluded that it is important to take into account the potential of social networks when designing a subject for postgraduate university education.

Thirdly, it is not possible to confirm hypotheses 3 and 4. On the one hand, the results show that students who perceived that participating on Twitter improved their interpersonal relationships and created a community with shared interests performed better academically, however, no significant differences were found, so hypothesis 3 cannot be proved. On the other hand, students who perceived that participating on Twitter helped them acquire knowledge and/or academic training performed better, but no significant differences were found, so it is not possible to confirm hypothesis 4 either.

It can be concluded that the students' positive assessment of the contribution of Twitter activity to improving their academic performance, which is revealed by the quantitative analysis, is also reflected in the qualitative analysis that shows that students highlight three types of knowledge that are facilitated by their participation on Twitter: practical knowledge, knowledge related to their speciality and general knowledge related to different academic areas. Students value the Twitter activity as a means of acquiring knowledge, especially theoretical-practical knowledge.

Finally, the research established that most of the tweets shared by the students were original (direct) messages with links and not the result of retweets, which is related to what they say about acquiring knowledge by consulting the links shared by their fellow students. These results are reflected in the qualitative study, which shows that students value the acquisition of knowledge by consulting the information contained in messages sent by fellow students, other tweeters and by consulting the news they later share.

References

Ahmed, I., & Qazi, T. F. (2011). A look out for academic impacts of Social networking sites (SNSs): A student based perspective. *African Journal of Business Management*, *5*, 5022-5031. https://doi.org/10.5897/AJBM11.595

Andersson, A., Hatakka, M., Grönlund, A., & Wiklund, M. (2014). Reclaiming the students – coping with social media in 1:1 schools. *Learning, Media and Technology*, *39*(1), 37-52. http://dx.doi.org/10.1080/17439884.2012.756518

Arribas, J. M. (2012). Academic performance in terms of the applied assessment system. *RELIEVE, 18*(1), 1-15. Retrieved from https://www.uv.es/RELIEVE/v18n1/RELIEVEv18n1_3eng.htm

Asterhan, C., & Bouton, E. (2017). Teenage peer-to-peer knowledge sharing through social network sites in secondary schools. *Computers & Education, 110*, 16-34. https://doi.org/10.1016/j.compedu.2017.03.007

Asterhan, C. S. C., & Hever, R. (2015). Learning from reading argumentative group discussions in Facebook – Rhetoric style matters (again). *Computers in Human Behavior*, *53*, 570–576. https://doi.org/10.1016/j.chb.2015.05.020

Balakrishnana, V., & Lay, G. G. (2016). Students' learning styles and their effects on the use of social media technology for learning. *Telematics and Informatics*, *33*(3), 808-821. https://doi.org/10.1016/j.tele.2015.12.004

Bellur, S., Nowaka, K. L., & Hullb, K. S. (2015). Make it our time: In class multitaskers have lower academic performance. *Computers in Human Behavior*, *53*, 63-70. https://doi.org/10.1016/j.chb.2015.06.027

Blazer, C. (2012). Social networking in schools: Benefits and risks; review of the research; policy considerations; and current practices. *Information Capsule, 1109*, 1-23.

Bligh Michael, G., Ruppel Erin, K., & Schoenbauer Kelsea, V. (2017). Cyberpsychology. *Behavior, and Social Networking*, *20*(5), 314-319. https://doi.org/10.1089/cyber.2016.0505

Cao, Y., Ajjan, H., & Hong, P. (2013). Using social media applications for educational outcomes in college teaching: A structural equation analysis. *British Journal of Educational Technology*, *44*(4), 581-593. http://dx.doi.org/10.1111/bjet.12066

Carpenter, J. P., & Krutka, D. G. (2015). Engagement through microblogging: Educator professional development via Twitter. *Professional Development in Education*, *41*(4), 707-728. http://dx.doi.org/10.1080/19415257.2014.939294

Carr, N. (2010). *The web shatters focus, rewires brains. Wired web*. Retrieved from https://www.wired.com/2010/05/ff_nicholas_carr/

Chai, J. X., & Fan, K. K. (2016). Mobile inverted constructivism: education of interaction technology in social media. *Eurasia Journal of Mathematics, Science & Technology Education*, *12*(5), 1425-1442. https://doi.org/10.12973/eurasia.2016.1522a

Cheung, C. M. K., Chiu, P. Y., & Lee, M. K. O. (2011). Online social networks: Why do students use Facebook? *Computers in Human Behavior*, *27*(4), 1337–1343. https://doi.org/10.1016/j.chb.2010.07.028

Crawford, K., Gordon, S., Nicholas, J., & Prosser, M. (1998). Qualitatively different experiences of learning mathematics at university. *Learning and Instruction*, *8*(5), 393-468. https://doi.org/10.1016/S0959-4752(98)00005-X

Dabbagh, N., & Kitsantas, A. (2011). Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education, 15*(1), 3-8. https://doi.org/10.1016/j.iheduc.2011.06.002

Dahlstrom, E., & Bichsel, J. (2014). ECAR study of undergraduate students and information technology. Research report. Louisville, Educause. CO: ECAR. Retrieved from http://www.educause.edu/ecar

Davis, K. (2015). Teachers' perceptions of Twitter for professional development. *Disability and Rehabilitation*, *37*(17), 1551-1558. http://dx.doi.org/10.3109/09638288.2015.1052576

De Pablos, J. (2007). El cambio metodológico en el espacio europeo de educación superior y el papel de las tecnologías de la información y la comunicación [The methodological change in the European Higher Education Area and the role played by the information and communication technologies]. *RIED. Revista Iberoamericana de Educación a Distancia*, *10*, 15–44. http://dx.doi.org/10.5944/ried.2.10.992

De-Marcos, L., Garcia-Lopez, E., & Garcia-Cabot, A. (2017). On the effectiveness of game-like and social approaches in learning: Comparing educational gaming, gamification & social networking. *Computers & Education*, *95*, 99-113. https://doi.org/10.1016/j.compedu.2015.12.008

Delgado, A. M., & Oliver, R. (2006). La evaluación continua en un nuevo escenario docente [The evaluation continues in a new teaching scenario]. *Revista de Universidad y Sociedad del Conocimiento*, 3(1). http://dx.doi.org/10.7238/rusc.v3i1.266

Delgado, A. M., Borge, R., García, J., Oliver, R., & Salomón, L. (2005). *Competencias y diseño de la evaluación continua y final en el espacio europeo de educación superior. Programa de Estudios y análisis [Competences and design of continuous and final evaluation in the European Higher Education Area. Program of Studies and analysis].* Madrid: MEC. Dirección General de Universidades.

Desselle, S. P. (2017). The use of Twitter to facilitate engagement and reflection in a constructionist learning environment. *Currents in Pharmacy Teaching and Learning*, *9*(2), 185-194. https://doi.org/10.1016/j.cptl.2016.11.016

Durak, G. (2017). Using Social Learning Networks (SLNs) in Higher Education: Edmodo Through the Lenses of Academics. *International Review of Research in Open and Distributed Learning*, *18*(1). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/2623/4037 , https://doi.org/10.19173/irrodl.v18i1.2623

Ebhomien, P., Oriahi, I. C., & A. Diahi, S. (2012). Influence of Continuous Assessment in the Teaching of Mathematics in Secondary Schools in Edo State. *Current Research Journal of Social Sciences*, *4*(5), 350-353. Retrieved from http://maxwellsci.com/print/crjss/v4-350-353.pdf

Eid, M. M., & Al-Jabri, I. A. (2017). Social networking, knowledge sharing, and student learning: The case of university students. *Computers & Education*, *99*, 14-27. https://doi.org/10.1016/j.compedu.2016.04.007

Forkosh-Baruch, A., & Hershkovitz, A. (2012). A case study of Israeli higher-education institutes sharing scholarly information with the community via social networks. *The Internet and Higher Education*, *15*(1), 58–68. https://doi.org/10.1016/j.iheduc.2011.08.003

Fraile, A., López, V. M., Castejón, F. J., & Romero, R. (2013). La evaluación formativa en docencia universitaria y el rendimiento académico del alumnado [Formative assessment

in higher education and student performance]. *Aula Abierta*, *41*(2), 23-34. Retrieved from https://dialnet.unirioja.es/descarga/articulo/4239063.pdf

García-Llamas, J. L., González, M. A., & Ballesteros, B. (2001). *Introducción a la investigación en educación II [Introduction to education research II]*. Madrid: UNED.

Ginns, P., & Ellis, R. A. (2009). Evaluating the quality of e-learning at the degree level in the student experience of blended learning. *British Journal of Educational Technology*, *40*(4), 652-663. https://doi.org/10.1111/j.1467-8535.2008.00861.x

Goodyear, V. A., Casey, A., & Kirk, D. (2014). Tweet me, message me, like me: using social media to facilitate pedagogical change within an emerging community of practice. *Sport, Education and Society*, *19*(7), 927-943. http://dx.doi.org/10.1080/13573322.2013.858624

Greenhow, C., & Robelia, B. (2009). Old communication, new literacies: Social network sites as social learning resources. *Computer Mediated Communication*, *4*, 1130-1161. https://doi.org/10.1111/j.1083-6101.2009.01484.x

Grgić, I. H., & Mučnjak, D. (2015). Social Networking Phenomenon and Its Use in Libraries. *Croatian Journal of Education*, *17*(1), 217-241. https://doi.org/10.15516/cje.v17i1.789

Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., & Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools. *Educational Media International*, *46*(1), 3–16. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/09523980802588626

Hawksey, M. (2013). *Twitter Archiving Google Spreadsheet (TAGS).* Retrieved from http://goo.gl/a5OpO

Hull, K., & Dodd, J. E. (2017). Faculty use of Twitter in higher education teaching. *Journal of Applied Research in Higher Education*, *9*(1), 91-104. http://dx.doi.org/10.1108/JARHE-05-2015-0038

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, *1*(2), 112-133. https://doi.org/10.1177/1558689806298224

Jones, M. D., & Baltzersen, M. (2017). Using twitter for economics business case discussions in large lectures. *International Review of Economics Education*, *26*, 14-18. https://doi.org/10.1016/j.iree.2017.08.001

Junco, R. (2012). The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement. *Computers & Education*, *58*(1), 162–171. https://doi.org/10.1016/j.compedu.2011.08.004

Junco, R., Heibergert, G., & Loken, E. (2010). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, *27*, 119-132

Kabilan, M. K., Ahmad, N., & Abidin, M. J. Z. (2010). Facebook: An online environment for learning of English in institutions of higher education? *The Internet and Higher Education*, *13*(4), 179–187. https://doi.org/10.1016/j.iheduc.2010.07.003

Karal, H., & Kokoc, M. (2013). Social Networking Site Usage among University Students: Differences of Educational Level. *Croatian Journal of Education*, *15*(3), 629-654.

Khan, T., Kend, M., & Robertson, S. (2016). Use of social media by university accounting students and its impact on learning outcomes. *Accounting Education*, *25*(6), 534-567. http://dx.doi.org/10.1080/09639284.2016.1230880

Kirschner, P. A. (2015). Facebook as learning platform: Argumentation superhighway or dead-end street? *Computers in Human Behavior, 53*(2015), 621–625. Retrieved from https://bit.ly/2WahhsP, https://doi.org/10.1016/j.chb.2015.03.011

Liu, C., Chen, Y., & Tai, D. (2017). A social network analysis on elementary student engagement in the networked creation community. *Computers & Education*, *115*, 14-125. https://doi.org/10.1016/j.compedu.2017.08.002

Lizzio, A., Wilson, K., & Simons, R. (2010). University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. *Studies in Higher Education*, *27*(1), 27-52. http://dx.doi.org/10.1080/03075070120099359

Lopez-Perez, M. V., Perez-Lopez, M. C., & Rodriguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers & Education, 56*, 818–826. https://doi.org/10.1016/j.compedu.2010.10.023

López, V. M. (2006). El papel de la evaluación formativa en el proceso de convergencia hacia el EEES. Análisis del estado de la cuestión y presentación de un sistema de intervención [The role of formative assessment in the process of convergence to the EHEA (European Higher Education Area). Overview and presentation of an intervention system]. *Revista Interuniversitaria de Formación del Profesorado*, *20*(3), 93-119. Retrieved from https://dialnet.unirioja.es/descarga/articulo/2484255.pdf

Macià, M., & García, I. (2016). Informal online communities and networks as a source of teacher professional development: A review. *Teaching and Teacher Education*, *55*, 291-307. https://doi.org/10.1016/j.tate.2016.01.021

Marinović, L. (2014). Exploring the Relationship Between Perceptions of Teaching Quality, Some Motivational Beliefs and Students' Achievement and Satisfaction. *Društvena istraživanja: Journal for General Social Issues*, *23*(4), 681-700. https://doi.org/10.5559/di.23.4.07

Moreno, B., Ramos, C., & Salomé, A. (2017). Efectos de las estrategias de enseñanza y aprendizaje universitarias en el rendimiento académico [Effects of Higher Education teaching and learning strategies on academic achievement]. *Revista d'Innovació Docent Universitària*, *9,* 39-53. Retrieved from http://revistes.ub.edu/index.php/RIDU/article/viewFile/RIDU2017.9.4/20378

Muskin, J. A. (2017). Continuous Assessment for Improved Teaching and Learning: A Critical Review to Inform Policy and Practice. *Current and Critical Issues in Curriculum, Learning and Assessment*, *13*. UNESCO. International Bureau of Education.

Nicol, D., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: a model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199-218. https://doi.org/10.1080/03075070600572090

Owston, R., York, D., & Murtha, S. (2013). Students perception and achievement in a university blended learning strategic initiative. *Internet and Higher Education, 18,* 38-46. https://doi.org/10.1016/j.iheduc.2012.12.003

Pedró, F. (2006). *The new millennium learners: Challenging our views on ICT and learning*. Paris: OECD- CERI. Retrieved from http://www.oecd.org/edu/ceri/38358359.pdf

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching context. *Journal of Educational Psychology*, *95*(4), 667–686. https://doi.org/10.1037/0022-0663.95.4.667

Preston, J. P., Jakubiec, B. A., Jones, J., & Earl, R. (2015). Twitter in a bachelor of education Course: Student experiences. *LEARNing Landscapes*, *8*(2), 301-317. Retrieved from http://ojs.learnquebec.ca/index.php/learnland/article/view/710

Quan-Haase, A., & Young, a. L. (2010). Uses and Gratifications of Social Media: A Comparison of Facebook and Instant Messaging. *Bulletin of Science, Technology & Society*, *30*(5), 350–361. https://doi.org/10.1177/0270467610380009

Ractham, P., & Firpo, D. (2011). Using social networking technology to enhance learning in higher education: A case study using Facebook. *Proceedings of the 47th Hawaii International Conference on System Sciences* (pp. 1–10). http://dx.doi.org/10.1109/HICSS.2011.479

Ramsden, P. (1979). Student learning and perceptions of the academic environment. *Higher Education*, *8*(4), 411-427. Retrieved from https://link.springer.com/article/10.1007%2FBF01680529?LI=true, https://doi.org/10.1007/BF01680529

Richardson, J. T. E. (2003). Approaches to studying and perceptions of academic quality in a short web-based course. *British Journal of Educational Technology*, *34*(4), 433–442. https://doi.org/10.1111/1467-8535.00340

Romero-López, M. A. (2017). European Higher Education Area-Driven Educational Innovation. *Procedia - Social and Behavioral Sciences*, 237, 1505-1512. *7th International Conference on Intercultural Education, Health and ICT for a Transcultural World*, *EDUHEM* (pp. 15-17). Spain: Almeria. https://doi.org/10.1016/j.sbspro.2017.02.237

Rowland, A., Craig-Hare, J., Ault, M., Ellis, J., & Bulgren, J. (2017). Social media: How the next generation can practice argumentation. *Educational Media International*, *54*(2), 99-111. http://dx.doi.org/10.1080/09523987.2017.1362818

Samiullah, M. I., & Anjum, A. (2017). Effect of Continuous Assessment Techniques on Students' Performance at Elementary level. *Bulletin of Education and Research*, *39*(1), 91-100. Retrieved from http://pu.edu.pk/images/journal/ier/PDF-FILES/7_39_1_17.pdf

San Martín, S., Jiménez-Torres, N., & Sánchez-Beatob, E. J. (2015). La evaluación del alumnado universitario en el Espacio Europeo de Educación Superior [The evaluation of the university students in the European Higher Education Area]. *Aula Abierta*, *44*(1), 7-14. Retrieved from http://www.sciencedirect.com/science/article/pii/S0210277315000141, https://doi.org/10.1016/j.aula.2015.03.003

San Miguel, R. (2010). Study on Facebook and Grades Becomes Learning Experience for Researcher. *Tech News World, Social Nertworking*. Retrieved from http://www.technewsworld.com/rsstory/66805.html?wlc=1286985671&wlc=1287195471

Santoveña-Casal, S. (2017). Conversations, Debates and Affiliation Networks on Twitter. *Turkish Online Journal of Educational Technology* (TOJET), *16*(3), 47-59.

Sobaih, A. E. E., Moustafa, M. A., Ghandforoush, P., & Khan, M. (2016). To use or not to use? Social media in higher education in developing countries. *Computers in Human Behavior*, *58*(1), 296-305. http://dx.doi.org/10.1016/j.chb.2016.01.002

Tang, Y., & Hew, K. F. (2017). Using Twitter for education: Beneficial or simply a waste of time? *Computers & Education*, *106*, 97-118. http://dx.doi.org/10.1016/j.compedu.2016.12.004

Tur, G., & Marín, V. (2015). Enhancing learning with the social media: student teachers' perceptions on Twitter in a debate activity. *New Approaches in Educational Research*, *4*(1), 46-53. https://doi.org/10.7821/naer.2015.1.102

Ullah, R., & Yasmeen, B. (2017). Environment, motivation and learning preferences: A study of higher education students in Pakistan. *Paradigms: A Research Journal of Commerce, Economics, and Social Sciences*, *11*(1), 123-127. Retrieved from http://paradigms.ucp.edu.pk/rcc/Volume11_75(environment-mot).pdf, https://doi.org/10.24312/paradigms110119

Veletsianos, G., & Navarrete, C. (2012). Online social networks as formal learning environments: learner experiences and activities. *International Review of Research in Open and Distance Learning*, *13*(1), 144–166. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1078/2077, https://doi.org/10.19173/irrodl.v13i1.1078

Weaver, M. R. (2006). Do students value feedback? Student perceptions of tutors' written responses. *Assessment & Evaluation in Higher Education*, *31*(3), 379-394. Retrieved from http://dx.doi.org/10.1080/02602930500353061

Wei, F. Y. F., Wang, Y. K., & Klausner, M. (2012). Rethinking college students' self-regulation and sustained attention: Does text messaging during class influence cognitive learning? *Communication Education*, *61*(3), 185–204. http://dx.doi.org/10.1080/03634523.2012.672755

Wesely, P. M. (2013). Investigating the community of practice of world language educators on Twitter. *Journal of Teacher Education*, *64*(4), 305-318. http://dx.doi.org/10.1177/0022487113489032

Wodzicki, K., Schwämmlein, E., & Moskaliuk, J. (2012). Actually, I wanted to learn: Study-related knowledge exchange on social networking sites. *The Internet and Higher Education*, *15*(1), 9–14. https://doi.org/10.1016/j.iheduc.2011.05.008

Yu, A. Y., Tian, S. W., Vogel, D., & Chi-Wai Kwok, R. (2010). Can learning be virtually boosted? An investigation of online social networking impacts. *Computers & Education*, *55*(4), 1494–1503. https://doi.org/10.1016/j.compedu.2010.06.015

Zappavigna, M. (2011). Ambient affiliation: a linguistic perspective on Twitter. *New Media & Society*, *13*(5), 788-806. https://doi.org/10.1177/1461444810385097

Zaragoza, J., Luis-Pascual, J. C., & Manrique, J. C. (2009). Experiencias de innovación en docencia universitaria: resultados de la aplicación de sistemas de evaluación formativa [Innovation experiences in Higher Education: results in the implementation of formative assessment systems]. *Red-U. Revista de Docencia Universitaria, 4*, 1-33. Retrieved from http://red-u.net/redu/files/journals/1/articles/111/public/111-97-2-PB.pdf, https://doi.org/10.1177/1461444810385097

Sonia Santoveña-Casal
National University of Distance Education,
Department of Didactics, School Organization
and Special Didactics. Faculty of Education
C/ Juan del Rosal, 14, Dpcho. 234, 28040 Madrid, Spain
ssantovena@edu.uned.es

Učinci kontinuiranoga vrednovanja akademskog postignuća budućih učitelja

Sažetak

Cilj je ovoga istraživanja proučiti utjecaj koji sustav vrednovanja ima na akademsko postignuće, uzimajući u obzir primjenu aktivnosti na društvenim mrežama (Twitter) i težinsku vrijednost percepcije studenata o poboljšanju međuljudskih odnosa i akademskog napretka. Uzorak ispitanika sastojao se od 519 studenata uključenih u diplomski sveučilišni studij (Master program) za obrazovanje nastavnika u srednjoškolskom obrazovanju pri Nacionalnom sveučilištu za Obrazovanje na daljinu u Španjolskoj (Universidad Nacional de Educación a Distancia): 332 odabralo je Mogućnost A (kontinuirano praćenje učenja preko zadatka), a 187 je odabralo Mogućnost B (vrednovanje učenja zasnovanog uglavnom na postignuću iz ispita). Značajne razlike dobivene su među studentima iz Mogućnosti A i onih iz Mogućnosti B. Studenti koji su bili uključeni u Twitter aktivnost, imali su bolja postignuća na ispitu i u CAT (zadacima za kontinuirano praćenje) u odnosu na studente iz Mogućnosti B. Zaključeno je da sustav kontinuiranog praćenja koji se temelji na zadacima i sudjelovanju u aktivnosti na društvenim mrežama, pomaže u poboljšanju akademskoga postignuća.

Ključne riječi: *formativno vrednovanje; nastavnici u srednjoškolskom obrazovanju; percepcije; sumativno vrednovanje; Twitter.*

Uvod

Posljednjih su godina važni napori napravljeni s ciljem osmišljavanja, a potom i primjenjivanja Europskog prostora visokoga obrazovanja (EHEA) koji je donio ne samo strukturne već i konceptualne i metodičke promjene u sveučilišne kurikule (Romero-López, 2017). U tom su kontekstu redefinirani silabi i preoblikovane metode poučavanja, osmišljeni su ciljevi i aktivnosti učenja, a nove tehnologije uvrštene su u obrazovanje. Posebna važnost dana je sustavu vrednovanja u kojemu se potiče primjena različitih alternativa za vrednovanje akademskog postignuća (Romero-López, 2017; San Martín, Jiménez-Torres i Sánchez-Beatob, 2015) te se naglašava važnost kontinuiranoga vrednovanja tijekom procesa učenja (Delgado i Oliver, 2006; López, 2006). Metodičke inovacije koje nalaže EHEA potaknule su integraciju

tehnologije u obrazovni proces s obzirom na to da se smatraju učinkovitim alatima za razvoj vještina (Pedró, 2006) te se pozornost trenutno stavlja na pedagoški potencijal društvenih mreža (De Pablos, 2007; Durak, 2017), kojima se studenti na sveučilištu sve češće koriste (Dahlstrom i Bichsel, 2014), i koje ne samo da otvaraju mogućnosti u profesionalnome smislu nego i omogućuju usvajanje novih znanja vezanih uz praksu poučavanja, metoda poučavanja i obrazovnih teorija (Macià i García, 2016).

Prije svega, polazište je koncept kontinuiranoga vrednovanja koji se razlikuje od standardnoga vrednovanja jer sadrži dva komplementarna aspekta, sumativno vrednovanje i formativno vrednovanje (Muskin, 2017), za koje se smatra da je glavni element za osiguranje kvalitete poučavanja. Formativni aspekt kontinuiranoga vrednovanja studentima nudi informaciju, povratnu informaciju i savjet tijekom procesa učenja, a sumativno vrednovanje nudi uvid u njihovo napredovanje (Muskin, 2017), a oba u kombinaciji omogućuju daljnju potvrdu ostvarenoga.

Kod procesa formativnoga vrednovanja kontinuirano praćenje ima povlašteno mjesto te je vrlo učinkovito pod uvjetom da se provodi planirano, a ne kao rezultat niza izoliranih i improviziranih testova (Arribas, 2012; Delgado, Borge, García, Oliver i Salomón, 2005). U tom kontekstu kontinuirano praćenje dopušta postupnu asimilaciju sadržaja putem komunikacije i interakcije s nastavnicima, a koja potiče osnaživanje u cijelom procesu (Nicol i Macfarlane-Dick, 2006; Weaver, 2006). Točnije, istraživanja su pokazala da kontinuirano praćenje ima pozitivan utjecaj na rezultate učenja (Arribas, 2012; Ebhomien, Oriahi i Diahi, 2012; Moreno, Ramos i Salomé, 2017; Samiullah i Anjum, 2017; Zaragoza, Luis-Pascual i Manrique, 2009). Kontinuirano praćenje ne samo da nudi učenicima povratnu informaciju, vrednovanje jakih i slabih točaka u učenju i promicanje navika učenja nego pomaže u sprečavanju zanemarivanja ispita (Ebhomien i sur., 2012). Kao što kažu Fraile, López, Castejón i Romero (2013), kontinuirano formativno vrednovanje ne zasniva se, općenito govoreći, na pisanje završnoga ispita, a ako se on koristi, rezultati su samo dio konačne ocjene, jer taj ispit samo nadopunjuje ocjene dobivene putem aktivnosti kontinuiranog praćenja.

Kao drugo, važno je uzeti u obzir potencijal društvenih mreža u području obrazovanja jer se prema Durak (2017) njihov obrazovni potencijal ne bi trebao zanemariti. Studenti na različitim stupnjevima obrazovanja (preddiplomski i diplomski) njima se koriste (Karal i Kokoc, 2013) za stvaranje zajednica (Bligh, Ruppel i Schoenbauer, 2017; Gunawardena, Hermans, Sanchez, Richmond, Bohley i Tuttle, 2009), premda privremenih po prirodi (Santoveña, 2017; Zappavigna, 2011), kako bi se družili i bili u kontaktu (Cheung, Chiu i Lee, 2011; Quan-Haase i Young, 2010; Wodzicki, Schwämmlein i Moskaliuk, 2012; Yu, Tian, Vogel i Chi-Wai Kwok, 2010), za dobrovoljne i neformalne rasprave (Kabilan, Ahmad i Abidin, 2010) i između ostaloga kao način izražavanja (Greenhow i Robelia, 2009).

Grgić i Mučnjak (2015) tvrde da istraživanja društvenih mreža u obrazovanju pokušavaju naći odgovor na mnoštvo pitanja od kojih su neka: *Koji su najbolji načini i primjeri dobre prakse*? i *Kako bi se trebali primijeniti*?. Pitanja koja potiču užarene

rasprave vjerojatno su ona koja istražuju ima li sudjelovanje na društvenim mrežama pozitivan učinak na učenikovo postignuće.

Ne manjka ni istraživanja koja tvrde da se korištenjem društvenih mreža smanjuje postignuće ili da čak nema nikakav učinak na učenje (Andersson, Hatakka, Grönlund i Wiklund, 2014; Asterhan i Hever, 2015), posebno kada se koristi u nastavi jer *multitasking* smanjuje učinak (Bellur, Nowaka i Hullb, 2015; Wei, Wang i Klausner, 2012). Društvene mreže smatraju se neučinkovitim područjima za stvaranje i/ili konstrukciju znanja (Kirschner, 2015) te se naglašava da je važno naučiti kako upravljati vremenom koje potrošimo na društvene mreže i izbjeći negativan učinak na postignuće (Ahmed i Qazi, 2011), ukazujući na činjenicu da je, što više društvenih mreža učenici upotrebljavaju, njihovo akademsko postignuće slabije (San Miguel, 2009; Junco, 2012). Postoje i istraživanja sa zaključcima da društvene mreže mogu osiromašiti korisnike te utjecati na njihova mišljenja i gledišta (Carr, 2010; Kirschner, 2015; Ractham i Firpo, 2011) umjesto da ih obogate.

S druge strane, mnoga su istraživanja pokazala i ukazala na velik potencijal društvenih mreža u kontekstu obrazovanja (Balakrishnan i Gan, 2016; Blazer, 2012; Eid i Al-Jabri, 2017; Veletsianos i Navarrete, 2012) te se one mogu uspješno koristiti u tom području (Forkosh-Baruch i Hershkovitz, 2012; Goodyear, Casey i Kirk, 2014; Sobaih, Moustafa, Ghandforoush i Khan, 2016), ukazujući na pozitivne povezanosti između njihove upotrebe i akademskog postignuća (Cao, Ajjan i Hong, 2013; Chai i Fan, 2016; De-Marcos, Garcia-Lopez i Garcia-Cabot, 2017; Junco, 2012; Khan, Kend i Robertson, 2016), smatrajući ih okruženjima u kojima se odvija komunikacija, interakcija i socijalizacija (De-Marcos i sur., 2017; Sobaih, Moustafa, Ghandforoush i Khan, 2016), kao i prostor za razmjenu znanja (Asterhan i Bouton, 2017; Eid i Al-Jabri, 2017) i tvrdnju da će se, neovisno o usluzi ili softveru koji se koristi, oni i dalje razvijati i postojati kako bi poticali komunikaciju i učenje (Rowland, Craig-Hare, Ault, Ellis i Bulgren, 2017).

Slični rezultati dobiveni su i u slučaju društvene mreže *Twitter*: postoji pozitivna povezanost između sudjelovanja u *microblogging*-u i postignućima studenata (Hull i Dodd, 2017), pod uvjetom da se koristi kao „push" tehnologija (učitelj preuzima inicijativu u komunikaciji, primjerice tako da studentu pošalje informaciju (Tang i Hew, 2017) ili se koristi unutar konstruktivističke paradigme (Desselle, 2017). Mnogi autori vide Twitter kao način produbljivanja obveza i uključivanja studenata u rad (Jones i Baltzersen, 2017; Junco, Heibergert i Loken, 2010; Liu, Chen i Tai, 2017; Tur i Marin, 2015), kao alat za razmjenu informacija (Veletsianos i Navarrete, 2012, među ostalima), kao medij koji potiče komunikaciju među studentima u obrazovnom okruženju, kako formalnu (Dabbagh i Kitsantas, 2011) tako i neformalnu (Tang i Hew, 2017) i koji često potiče stvaranje grupa ili zajednica (Bligh i sur., 2017; Carpenter i Krutka, 2015). Procesi društvene interakcije i načini razmjene informacija koje se mogu razviti putem Twittera imaju pozitivan učinak u smislu stvaranja zajednice među studentima (Bligh i sur., 2017). Nadalje, ne manjka istraživanja koja naglašavaju

vrijednost Twittera kao prostora koji produbljuje interakciju između nastavnika i studenata (Preston, Jakubiec, Jones i Earl, 2015). Carpenter i Krutka (2015) kažu da nastavnici vole Twitter zbog prilika koje im nudi u vezi sa stručnim usavršavanjem, zbog neposrednosti, interaktivnog potencijala i iskoristivosti. Točnije, nastavnici se koriste Twitterom kako bi dijelili iskustva, promišljali, raspravljali i dijelili obrazovne resurse (Davis, 2015; Wesely, 2013).

Na kraju bi trebalo naglasiti da je učenički doživljaj procesa učenja temeljni element koji treba uzeti u obzir (Ginns i Ellis, 2009). Istraženo je da pozitivne percepcije studenata u vezi s različitim elementima procesa učenja i poučavanja mogu biti prediktori rezultata učenja (Crawford, Gordon, Nicholas i Prosser, 1998; Lizzio, Wilson i Simons, 2010; Lopez-Perez, Perez-Lopez i Rodriguez-Ariza, 2011; Marinović, 2014; Owston, York i Murtha, 2013; Ramsden, 1983; Richardson, 2003; Ullah i Yasmeen, 2017). Istraženo je i analizirano mnogo aspekata. Značajna povezanost ustanovljena je između percepcije, motivacije, sklonosti za učenje i pristupu učenju (Richardson, 2003; Ullah i Yasmeen, 2017), uočenom važnosti kolegija (Ramsden, 1983) i različitih elemenata iz okruženja za učenje (radno opterećenje, vrednovanje i resursi za učenje, itd.) (Lizzio i sur., 2010; Ullah i Yasmeen, 2017), kao i akademskog postignuća. Istraživanja pokazuju da ljudi koji smatraju da stvari rade dobro, imaju običaj raditi više te su uporniji i bolje funkcioniraju (Pintrich, 2003), jer pozitivna percepcija iskustva učenja, može, osim poboljšanja ocjena, smanjiti stopu prekida školovanja (Lopez-Perez i sur., 2011) a studenti koji imaju pozitivnu percepciju kombiniranoga učenja, odnosno *blended learning* (privlačnost, prikladnost, zadovoljstvo) imaju bolje postignuće od onih s negativnim percepcijama (Owston i sur., 2013).

Ukratko, istraživanje prikazano u ovome radu temelji se na važnosti kontinuiranoga vrednovanja akademskog postignuća, uzimajući u obzir učinak aktivnosti utemeljenih na društvenoj mreži (Twitter) i percepcije studenata o poboljšanju međuljudskih odnosa i poboljšanom akademskom postignuću. Istraživanje je provedeno u kontekstu kolegija Stvaranje i razvoj kurikula (*Design and development of the curriculum)* u programu Sveučilišnog diplomskog studija za obrazovanje nastavnika u sekundarnom obrazovanju, obrazovanju prvostupnika, profesionalnom obrazovanju i poučavanju jezika pri *Nacionalnom sveučilištu za Obrazovanje na daljinu u Španjolskoj* (UNED) unutar diplomskog sveučilišnog studija (Master) za obrazovanje nastavnika za obvezno sekundarno obrazovanje, maturu, profesionalno usavršavanje i poučavanje jezika.

Cilj i važnost istraživanja

Smatramo da su glavni doprinosi u području istraživanja prikazanoga u ovome radu uzorak ispitanika, svrha i metoda istraživanja.

Posljednjih godina UNED, jedino sveučilište za obrazovanje na daljinu u Španjolskoj, razvilo je i iznjedrilo akademski stupanj prema standardima EHEA. Sveučilište UNED – Fakultet za obrazovanje nastavnika, sadrži diplomski sveučilišni program za obrazovanje nastavnika u sekundarnom obrazovanju (obvezan za nastavnike u

srednjoškolskom programu i programu za obrazovanje prvostupnika, stručnom usavršavanju i jezicima) i jedan je od glavnih stupova sveučilišta. Sedam godina nakon uvođenja programa nastaje potreba za analizom učinkovitosti novih metoda poučavanja koje su primijenjene u jednom od obveznih temeljnih kolegija za sve studente u diplomskom studiju: Izrada i razvoj kurikula. Taj primjer daje važan uvid u potrebne podatke.

Nadalje, predmet istraživanja jest analiza interakcije četiriju fundamentalnih (prema EHEA) aspekata: sustav kontinuiranoga vrednovanja, aktivnosti učenja, integracija tehnologija u proces obrazovanja i mogući pedagoški potencijal društvenih mreža. Stoga se istraživanjem želi analizirati utjecaj različitih varijabli na akademsko postignuće, integrirajući nekoliko varijabli koje neki istraživači izdvajaju kao značajne. Istraživanje uzima u obzir kontinuirano vrednovanje kao element metode poučavanja (vidi Moreno, Ramos i Salomé, 2017), iskustva studenata u vezi s procesom učenja, kao što to rade Marinović (2014) i Ullah i Yasmeen (2017); također uključuje i društvene mreže, jedan od inovativnijih elemenata u posljednjim istraživanjima (vidi Liu, Chen i Tai, 2017; Tang i Hew, 2017), u pokušaju da pridonese istraživanju o utjecaju mreža na obrazovni potencijal i akademsko postignuće, a to je, smatra se, jedno od gorućih pitanja u ovome istraživanju (Grgić i Mučnjak, 2015) te ga zbog toga čini iznimno važnim.

Kombinirana kvantitativna i kvalitativna metoda istraživanja u ovome radu smatra se vrlo važnom. Kombinacija dviju metoda poboljšava kvalitetu procesa istraživanja (Johnson, Onwuegbuzie i Turner, 2007). Napravljene su deskriptivna i relacijska analiza, a odgovori studenata u izvješću o aktivnosti na Twitteru na kraju semestra bili su podvrgnuti analizi sadržaja. Oba fokusa pomažu u proučavanju akademskog postignuća i sudjelovanja na Twitteru.

Ukratko, cilj ovoga istraživanja bio je proučiti utjecaj primijenjenog sustava za vrednovanje akademskog postignuća uzimajući u obzir primjenu aktivnosti zasnovanoj na društvenoj mreži (Twitter) i važnost percepcije studenata o novonastalim međuljudskim odnosima i akademskom postignuću.

Specifični ciljevi istraživanja su sljedeći:

1. Analizirati akademsko postignuće prema alternativnom kontinuiranom vrednovanju koje su studenti odabrali.
2. Istražiti sudjelovanje u Twitteru (broj *tweetova*, poveznica, *re-tweetova* i odgovora @s) tijekom akademske godine.
3. Proučiti povezanost između sudjelovanja na Twitteru i akademskog postignuća.
4. Analizirati povezanost između sudjelovanja na Twitteru i poboljšanju međuljudskih odnosa i/ili stvaranja zajednice ljudi sa zajedničkim interesima.
5. Ispitati povezanost između pozitivne percepcije sudjelovanja na Twitteru (*tweetovi*, *re-tweetovi*, itd.) i akademskog postignuća.

Način izvođenja kolegija

Kolegij Izrada i razvoj kurikula obvezni je kolegij koji se izvodi u drugome semestru te je zajednički kolegij svim studentima u diplomskom sveučilišnom programu

obrazovanja nastavnika u obveznom sekundarnom obrazovanju, obrazovanju prvostupnika, u strukovnom obrazovanju i u poučavanju jezika pri UNED. Taj sveučilišni diplomski program obvezan je za profesiju nastavnik u obveznom sekundarnom obrazovanju, srednjoškolskom obrazovanju (matura), strukovnom obrazovanju i poučavanju jezika u Španjolskoj.

Predmet ispunjava uvjete EHEA (prema kompetencijskom modelu učenja) te je prilagođen modelu poučavanja UNED odnosno modelu obrazovanja na daljinu. Nastavnički tim odgovoran je za izradu kolegija koji se temelji na očekivanim vještinama i ishodima učenja i koji traži povezanost između različitih elemenata kurikula, ciljeva, didaktičkih materijala, sustava za evaluaciju (ispiti i zadaci kontinuiranoga vrednovanja (CAT), među ostalima). Didaktički materijali (osnovni i komplementarni) odabrani su i razvijeni s obzirom na vještine i planirane ishode učenja. Sve informacije o kolegiju nalaze se u didaktičkim vodičima (plan rada i vodič s općim informacijama) koje pomažu studentu u samostalnom učenju. Nastavnički tim surađuje sa 6 nastavnika-tutora koji sudjeluju u nastavi kroz on-line lekcije. Njihov je osnovni zadatak surađivati s nastavničkim timom na način da moderiraju forume i ispravljaju CAT.

On-line kolegij je glavni prostor za komunikaciju i interakciju u kojem se sastaju nastavnički tim, nastavnik-tutor i studenti. Svi materijali, prateći materijali za čitanje, videolekcije i didaktički vodiči potrebni za proučavanja sadržaja digitalizirani su i nalaze se u on-line kolegiju. Osnovni medij za komunikaciju jest forum za raspravu i on se može smatrati centrom za komunikaciju, interakciju i raspravu. Svrha ovoga rada nije detaljno analizirati sudjelovanje na ovome alatu, nego spomenuti da je više od 1,427 poruka poslano u 9 foruma (studenti, opća pitanja, forum za svaku temu i aktivnost i forum za pitanja vezana uz ispit). Svaki nastavnik fokusira se na forum u vezi s određenom temom i specifičnom aktivnosti te daje podršku studentima i prati njihov napredak.

Model formativnog i sumativnog vrednovanja koristio se kako bi se vrednovao proces učenja. Formativno vrednovanje provodi se tijekom procesa učenje (ono je postupno i kontinuirano) te nudi smjernice, regulira učenje i motivaciju studenta. Tijekom semestra nastavnici pružaju povratnu informaciju i podršku kod CAT, rješavaju moguće nedoumice i nude studentima smjernice kako bi što uspješnije dostigli ciljeve te analiziraju napredak studenata u aktivnostima. S druge strane, sumativno vrednovanje provodi se na kraju kolegija sa svrhom integracije, napredovanja i akreditacije. Ono je rezultat ocjena dobivenih na ispitu i ocjena dobivenih kroz aktivnosti u kontinuiranom vrednovanju. Svaki dio nosi 50 % konačne ocjene. Da bi se zadovoljile aktivnosti kontinuiranoga vrednovanja CAT (Opcija A), student mora ostvariti najmanji broj bodova za svaku od aktivnosti. Konačna ocjena za CAT ostvareni je broj bodova od ukupnih 10. Da bi se proces poučavanja i učenja prilagodio studentima, dva modaliteta ili plana rada ponuđeni su u kolegiju. Studenti su mogli odabrati jednu od dviju ponuđenih mogućnosti:

a) Mogućnost A. Evaluacija učenja uglavnom utemeljena na kontinuiranom vrednovanju: Izvršenje 4 obvezne aktivnosti i ispit „tipa A" koji osobno dolaze pisati. Taj ispit sastoji se od odgovora na pitanje esejskog tipa o temi 6 „Dokazi učenja".

b) Mogućnost B. Dokaz o učenju uglavnom utemeljen na rezultatu iz ispita: Izvršenje jedne aktivnosti od ponuđene 4 i pisanje ispita „tipa B" koji osobno dolaze pisati. Taj ispit pokriva cijeli silab za kolegij te se sastoji od pet kratkih pitanja. U toj mogućnosti ne sudjeluje se u Twitter aktivnosti.

U obje mogućnosti (A i B) vrednovane su iste kompetencije. Sadržaj je odabran na osnovi kompetencija i ishoda učenja definiranih u kolegiju. U obje mogućnosti poučava se isti sadržaj, a jedina razlika između opcije A i opcije B je nastavna metoda. Stoga se može potvrditi da je za sve studente predviđeno stjecanje istih kompetencija.

Ponuđene su sljedeće aktivnosti:

Aktivnost 1. Osobni vokabular
- Cilj: razviti osobni vokabular odabiranjem najmanje 4 specifična koncepta iz teme 1 (Didaktika i kurikul) i teme 2 (Izrada kurikula i planiranje) za učenje koje prema mišljenju studenta mogu najbolje izraziti specifičan sadržaj teme.
- Težina 2 boda.
- Minimalan broj bodova za prolaz: 1

Aktivnost 2. Konceptualna mapa
- Cilj: izraditi konceptualnu mapu sadržaja iz dokumenta na temu 3: Formativni procesi u razredu: Strategije učenja-poučavanja.
- Težina 2 boda.
- Minimalan broj bodova za prolaz: 1

Aktivnost 3. Društvene mreže
- Cilj: ukazati na korisnost društvenih mreža i njihovu primjenu i prilagodbu u području uže specijalnosti studenta. Tema za objavu na društvenim mrežama povezana je s didaktičkim iskustvima i/ili provedenim istraživanjem koje uglavnom istražuje primjenu društvenih mreža u nastavi. Točnije, student bi trebao razmijeniti informacije i mišljenja vezana uz izvore, publikacije, web stranice itd. koje se bave i opisuju iskustva poučavanja putem društvenih mreža sa studentima, unutar njihova interesnog područja.
- Povezano s Temom 4. Procesi opismenjavanja na društvenim mrežama u sekundarnom obrazovanju.
- Težina 3 boda.
- Minimalan broj bodova za prolaz: 1.5

Aktivnost 4. Odabir materijala
- Povezano s Temom 5. Odabir kurikularnih materijala. Odabir, vrednovanje i priprema izvješća o primjerenosti didaktičkoga materijala koji će se koristiti u području specijalnosti studenta.
- Težina 3 boda.
- Minimalan broj bodova za prolaz: 1.5

Ukratko, kolegij je izrađen s ciljem integriranja teorijskih i praktičnih aspekata koji se poučavaju. Nadalje, cilj je zadataka u kontinuiranom vrednovanju omogućiti usvajanje znanja te produbljivanje teorijskih spoznaja iz materijala. Planirane aktivnosti za ostvarenje cilja kolegija osmišljene su da bi produbile učenje te služile kao instrument za refleksiju i teorijsku/praktičnu primjenu sadržaja.

Metode

Ciljevi istraživanja i hipoteze

Cilj ovoga istraživanja bio je ispitati utjecaj načina vrednovanja na akademsko postignuće, uzimajući u obzir primjenu aktivnosti utemeljene na društvenim mrežama (Twitter) i važnost percepcije studenata o nastalim međuljudskim odnosima i akademskom napretku. Za ostvarenje cilja ponuđene su sljedeće hipoteze:

H1. Akademsko postignuće studenata koji su se odlučili za Mogućnost A – kontinuirano praćenje učenja poredstvom zadatka, bit će uspješnije od učenika koji su odabrali vrednovanje koje je utemeljeno na postignuću u ispitu (Opcija B).

H2. Sudjelovanje u Twitteru imat će pozitivne učinke na postignuće studenata.

H3. Studenti čije je mišljenje da sudjelovanje u Twitteru poboljšava njihove međuljudske odnose/ili stvaranje zajednice sličnih interesa, imat će bolji akademski uspjeh.

H4. Studenti koji misle da će sudjelovanje u Twitteru pomoći u usvajanju znanja i/ili akademskom osposobljavanju imat će bolji akademski uspjeh.

Uzorak ispitanika

Uzorak se sastojao od 634 studenta upisana u kolegij Izrada i razvoj kurikula, koji je sastavni kolegij u programu diplomskog sveučilišnog studija (Master) za obrazovanje nastavnika za obvezno sekundarno obrazovanje, maturu, profesionalno usavršavanje i poučavanje jezika pri UNED, u akademskoj godini 2016./17. Uzorak je činilo 519 studenata koji su pristupili ispitu i proveli aktivnosti kontinuiranoga vrednovanja (CAT): 332 je odabralo Mogućnost A, a njih 187 Mogućnost B. Pogreška uzorka dobivena je na osnovi jednostavnog nasumičnog uzorkovanja kod najnepovoljnijeg slučaja u uzorku (p=q= 0,5) za interval pouzdanosti od 95 %, što ukazuje na pogrešku u uzorku od 1,8 % za istraživanje izvedbe koja se temelji na usporedbi rezultata dobivenih iz obiju skupina studenata i 3,7 % za istraživanje utemeljeno na studentima koji su izvršili zadatak na Twitteru CAT (CAT_TW) (Tablica 1).

Tablica 1

Istraživanje i instrumenti

Istraživanje se temelji na kombiniranoj metodi, odnosno kvantitativnoj i kvalitativnoj koncepciji istraživanja. S jedne strane, provedene su deskriptivna i relacijska analiza koristeći se t-testom studenata, jednofaktorska ANOVA i Spearmanova relacijska analiza. S druge strane, provedena je analiza sadržaja odgovora studenata sadržanih u

izvješću o Twitter aktivnosti, koja je zatražena na kraju semestra. Podaci su analizirani koristeći se trima osnovnim softverskim programima: Excel-om za organiziranje podataka, SPSS Statistics verzijom 22 za statističku obradu i Atlas.ti HM za analizu sadržaja. U izvješću o Twitter aktivnosti studenti su morali priložiti podatke o Twitter računu te je na taj način osigurana verifikacija njihova identiteta.

Za istraživanje izvedbe na osnovi odabira studenata (A ili B) koristili su se popisi o rezultatima na ispitu i rezultati na zadacima u kontinuiranome praćenju (CAT) kao instrumenti za prikupljanje podataka. Relacijska analiza srednjih vrijednosti provedena je t-statistikom studenata kako bi se usporedila izvedba studenata koji su odabrali Mogućnost A i onih koji su se odlučili za Mogućnost B uz pomoć Mann-Whitney neparametrijskog U-testa. Naknadno je napravljena Spearmanova korelacijska analiza između ocjena dobivenih putem CAT-a i ocjena dobivenih na testu.

Nadalje, za analizu sudjelovanja na Twitteru koristile su se Twitter aplikacija (API) i Google TAGS v6 tablica (Hawksey, 2013) i tako su se kompilirale poruke objavljene na Twitteru te se 16. listopada 2017. pristupilo računima studenata kako bi se zabilježile njihove aktivnosti vezane uz broj tweetova, pratitelja, broja osoba koje se prati i lajkova).

Za kontinuirano praćenje aktivnosti na Twitteru od ožujka do lipnja 2017. preuzeli smo Twitter podatke koristeći se Google TAGS v6 tablicom (Hawksey, 2013) i grupirali ih prema mjesecima. Deskriptivna analiza podataka o sudjelovanju i relacijsko istraživanje provedeno je da bi se otkrile razlike u izvedbi: Student t-test za usporedbu izvedbe na Twitteru CAT i studenata iz Mogućnosti B, usporedba podataka s Mann-Whitney U-test podacima, te Spearmanova korelacijska analiza između ocjena dobivenih putem Twitter CAT zadataka i ocjena dobivenih u ispitu.

Kao treće, za istraživanje percepcije studenata o utjecaju Twitter iskustva na postignuće, informacija je dobivena iz izvješća koja su morali predati na kraju semestra. Informacije su dobivene prema sljedećem:

1. Vrednovanje Twitter iskustva: Pozitivno; Vrlo pozitivno; Negativno ili Neutralno. Obrazloži svoj odgovor.
2. Je li sudjelovanje u aktivnostima utjecalo na tvoj odnos s drugim kolegama, studentima? Pozitivno ili vrlo pozitivno, Negativno ili bez utjecaja; Ne znam; Nema odgovora. Obrazloži svoj odgovor.
3. Jesi li uspostavio zajednicu za učenje ili zajednicu članova sličnih interesa? Da; Ne; Ne znam; Nema odgovora. Obrazloži svoj odgovor.
4. Jesi li usvojio znanja putem aktivnosti? Da; Ne. Obrazloži svoj odgovor.
5. Kakva si znanja usvojio putem aktivnosti? Teorijska: Praktična; Oba (teorijsko-praktična). Obrazloži svoj odgovor.
6. Misliš li da si poboljšao svoje obrazovanje općenito i/ili u specifičnim segmentima vezanima uz materijale? Da, opće obrazovanje; Da, opće i specifično obrazovanje; Nije imalo utjecaja na obrazovanje. Obrazloži svoj odgovor.

Deskriptivna analiza provedena je i nakon toga primijenjena ANOVA analiza faktora da bi se odredila razlika u postignućima uzimajući u obzir sljedeće varijable:

Mreža kontakata; Zajednica sličnih interesa; Vrsta usvojenoga znanja; Akademsko usavršavanje. Za analizu razlika srednjih vrijednosti među parovima koristili su se Tukey i Bonferroni HSD.

Potom su analizirani odgovori otvorenoga tipa o vrsti znanja koja su stekli i utjecaju aktivnosti na opće i specifično učenje koristeći se Atlas.ti softverom. Analiza sadržaja prati upute prema García-Llamas, González i Ballesteros (2001, str. 1) koji definiraju sadržaj i odabir uzorka; 2) odluka o jedinici analize i uspostavljanje kategorija. Ekstrahirane su tri osnovne kategorije:

– Praktično znanje: Uporaba, Alati
– Specifično znanje: Specijalnost, Materijal
– Opće znanje: Konceptualno, Kognitivno, Primjena u razredu.

Rezultati kodirane kategorizacije prikazani su u konceptualnoj mapi ukazujući na njihove pojave (učestalost pojave) i gustoću (broj kodova povezanih s kategorijom). Nadalje, uključili smo i doslovne komentare studenata koji su ukazali na broj glavnoga dokumenta analize i liniju iz kojega je komentar izvučen.

Procedura

Istraživanje je provedeno tijekom akademske godine 2016./2017.:

– Faza I. listopad – prosinac 2016. Izrada teme, proces kontinuiranoga praćenja i izrada nastavnih aktivnosti.
– Faza II. veljača – svibanj 2017. razvoj nastavnog procesa, početak aktivnosti.
– Faza III. ožujak – lipanj 2017. Progresivno (tjedni) izvlačenje podataka s Twittera primjenom Twitter i Google TAGS tablice v6 sučelje namjenskih programa (API) (Hawksey, 2013).
– Faza IV. svibanj – lipanj 2017. predaja i vrednovanje izvješća s uobičajenih ispita.
– Faza V. rujan 2017. predaja i vrednovanje izvješća s posebnih ispita.
– Faza VI. listopad 2017. izvlačenje podataka iz Twitter korisničkih računa (tweetovi, lajkovi, pratitelji, zapraćeni).
– Faza VII. listopad 2017.: Analiza podataka i donošenje zaključaka.

Rezultati

Rezultati istraživanja prikazani su u tri odlomka koji su povezani s četiri hipoteze postavljene u istraživanju.

Prvo, utjecaj odabranog oblika vrednovanja (Mogućnost A ili B) na izvedbu analiziran je kako bi se testirala hipoteza 1. Drugo, sudjelovanje na Twitteru i utjecaj na izvedbu analiziran je da bi se potvrdila ili opovrgnula hipoteza 2. Treći odlomak prikazuje rezultate dobivene iz percepcije studenata o Twitteru u odnosu na poboljšanje njihovih međuljudskih odnosa i akademskog obrazovanja s ciljem potvrđivanja ili opovrgavanja hipoteza 3 i 4.

Sustav vrednovanja: Mogućnost *A ili* Mogućnost *B*

Ovisno o vrsti vrednovanja koju je student izabrao, rezultati pokazuju da su studenti koji su odabrali Mogućnost A (kontinuirano vrednovanje učenja putem zadataka)

stekli bolje rezultate u CAT i na ispitu od studenata koji su se odlučili za Mogućnost B (vrednovanje naučenoga – ispit). Podaci iz uzorka, prema t-statistici pokazali su da je razlika među dva uzorka značajna u korist CAT [F (46,62) t = 2,013, Sig. (Bilateral) = ,045] i ispita [F (0,237) t = 3,325, Sig. (Bilateral) = ,001]. Nadalje, značajne razlike uočene su i kod konačnih ocjena za kolegij. S obzirom na nepravilnu distribuciju varijabli u uzorku te da bi se potvrdio Student t-podatak, izračunat je Mann-Whitney U za te varijable. Potvrđene su značajne razlike u odnosu na ispit i kod konačne ocjene za kolegij, međutim ne i za rezultat iz CAT (Tablica 2).

Tablica 2

S druge strane, značajna Spearmanova korelacija 0.05 dobivena je na bilateralnoj razini između rezultata dobivenih u CAT i ocjene iz ispita.

Sudjelovanje na Twitteru

Studenti su sudjelovali u društvenim mrežama 3 tjedna prema vlastitom izboru tijekom veljače, ožujka, travnja i svibnja 2017. U tom razdoblju studenti su aktivno sudjelovali slanjem minimalno 50 poruka, u intervalima svaki dan ili svaka dva dana. Najmanje 20 poruka bile su izravne, ostalih 30 poruka bile su rezultat re-tweetanja (prosljeđivanja poruka), citiranja i odgovaranja na poruke drugih studenata. Analiza korisničkih računa studenata pokazala je da su, u prosjeku, imali 195,87 korisničkih računa koje su pratili te, u prosjeku, 153,20 pratitelja, 171,08 tweetova i 142,41 lajkova.

Uzimajući u obzir sve studente u Twitter aktivnosti, studente iz Mogućnosti A ili Mogućnosti B, evidencija poruka poslanih tijekom akademske godine ukazala je na progresivno i kontinuirano povećanje u četiri osnovna indikatora (broj re-tweetova, poveznica, poruka s @identifikator i tweetova) (Prikaz 1). Većina poruka sadržavala je link (61,5 %), 20,3 % su bili re-tweetovi a 33,6 % sadržavalo je @naziv.

Prikaz 1

Većina studenata (91,87 %) smatra da je iskustvo dobiveno posredstvom Twittera bilo pozitivno (62,05 %) ili vrlo pozitivno (29,82 %). 7,23 % smatra da to iskustvo nije bilo ni pozitivno ni negativno. Samo dva studenta (0,60 %) smatraju da je bilo negativno.

S obzirom na postignuće rezultati pokazuju da je postignuće studenata bilo bolje na Twitter aktivnosti nego u drugim aktivnostima iz Mogućnosti A: Aktivnost 1. Osobni vokabular (M = 8,41); Aktivnost 2. Konceptualna mapa (M = 8,22); Aktivnost 3. Društvene mreže (M = 8,52), i Aktivnost 4. Vrednovanje didaktičkog materijala (M = 8,36). Nadalje, analiza studentskih uradaka u Twitter aktivnosti u odnosu na studente iz Mogućnosti B pokazala je da su studenti koji su bili uključeni u Twitter aktivnosti imali bolje rezultate iz ispita (M = 6,9) i u CAT (M = 8,5) (Tablica 3).

Tablica 3

Značajne razlike utvrđene su između dva testa, postignuće u CAT i u ispitu za studente koji su bili uključeni u Twitter i one koji su odabrali Opciju B: CAT [F (26,918) t= 2,899, Sig. (bilateral)= ,004] i Ispit [F (,237) t= 3,350, Sig. (bilateral)= ,003], što je i potvrđeno primjenom Mann-Whitney U statistike (Tablica 4).

Tablica 4

Percepcije utjecaja Twittera na poboljšanje međuljudskih odnosa i akademskog postignuća

U vezi s percepcijom da sudjelovanje u Twitter aktivnosti utječe na njihove međuljudske odnose unutar obrazovne zajednice, analizirana su dva aspekta: utjecaj na mrežu kontakata i generiranje zajednice ili grupe sa zajedničkim interesima.

94,28 % studenata procijenilo je utjecaj sudjelovanja na Twitteru za stvaranje mreže kontakata kao pozitivno ili vrlo pozitivno iskustvo. Samo njih 3,31 % smatralo je taj utjecaj negativnim ili nepostojećim. S druge strane, 71,39 % studenata smatralo je da je ta aktivnost pomogla u stvaranju zajednice ili skupine sa zajedničkim interesima. Samo 14,46 % izjavilo je da nisu kreirali zajednice, a 14,16 % nije znalo ili nije eksplicitno odgovorilo na pitanje.

Studenti koji su procijenili utjecaj aktivnosti na njihov odnos s drugim studentima pozitivno ili vrlo pozitivno imali su bolje rezultate u CAT aktivnostima i u ispitu u odnosu na one koji su ga procijenili negativno ili da nije uopće imalo utjecaja (Tablica 5). Značajne razlike utvrđene su koristeći se analizom varijance (ANOVA) s obzirom na izvedbu u CAT, ali ne i odnosu na ispit. Te razlike su značajne s F (3,850), a vrijednost značajnosti ,022. Tukey i Bonferroni HSD testovi otkrili su značajne razlike među procjenama „pozitivno ili vrlo pozitivno" i „negativno" s 0,018 (Tukey HSD) i 0,019 (Bonferroni).

Tablica 5

Nadalje, studenti koji su smatrali da su kreirali zajednicu ili skupinu sa zajedničkim interesima, imali su bolje rezultate na oba zadatka (Tablica 6), ali nije bilo značajnih razlika.

Tablica 6

U vezi s percepcijom da je sudjelovanje u Twitter aktivnosti utjecalo na poboljšanje akademskog postignuća, analizirana su dva aspekta: percepcija usvajanja akademskog znanja i poboljšanje u općem i/ili specifičnom osposobljavanju.

Rezultati pokazuju da 97 % studenata smatra da su putem aktivnosti usvojili znanje, a većina je studenata (85,54 %) rekla da je vrsta usvojenoga znanja teorijsko-praktična. Samo 12 % reklo je da je to bilo isključivo praktično znanje, a 2,4 % da je bilo uglavnom teorijsko.

Studenti koji su izjavili da su usvojili teorijsko-praktično znanje, imali su bolje rezultate u CAT, bez značajnih razlika. Međutim, studenti koji su izjavili da je znanje

koje su usvojili uglavnom teorijsko, imali su bolje rezultate iz ispita (Tablica 7), sa značajnim razlikama u odnosu na druge dvije grupe (praktično, i teorijsko-praktično) [F = 4,132, Sig. = ,017]. Tukey HSD testovi pokazali su da postoji značajna razlika između „teorijskog" i „praktičnog" (Sig.= ,045), kao i između „praktičnog" i „oba" (Sig.= ,046).

Tablica 7

S druge strane, istraživanje je pokazalo da većina studenata (99,10 %) tvrdi da je sudjelovanje u Twitter aktivnosti rezultiralo poboljšanjem njihova općega i/ili specifičnog osposobljavanja. 55,29 % smatra da je ta aktivnost imala pozitivan učinak na opće i specifično osposobljavanje (vezano uz kolegij, vezano uz druge kolegije u diplomskom programu i/ili vezano uz specijalnost studenta), kao i na usvajanje općeg znanja vezanoga uz Twitter. 43,81 % izjavilo je da je aktivnost doprinijela njihovu općem obrazovanju (u vezi s korištenjem i integracijom društvenih mreža u razredu, kao i u vezi sa znanjem vezanim uz izradu aktivnosti unutar okvira kurikula). Samo troje studenata izjavilo je da aktivnost nije doprinijela njihovu osposobljavanju.

ANOVA analiza nije pokazala značajne razlike između postignuća u ispitu s obzirom na vrstu općeg i/ili specifičnog osposobljavanja koje su naveli kao usvojeno.

Na kraju, analiziran je sadržaj odgovora vezan uz vrstu usvojenoga znanja i utjecaj aktivnosti na njihovo opće ili specifično osposobljavanje. Ekstrahirane su tri osnovne kategorije (Prikaz 2):

– Praktično znanje: Pristup, Alati
– Specifično znanje: Specijalnost, Materijal
– Opće znanje: Konceptualno, Kognitivno, Primjena u razredu

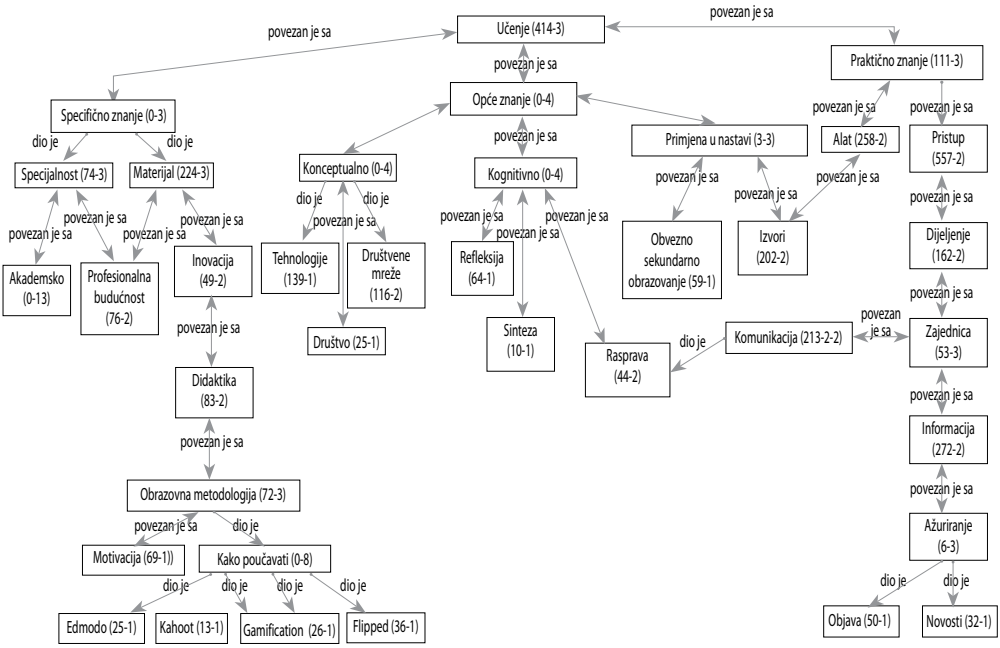
Spomenute tri kategorije povezane su konceptom učenja i ne predstavljaju zatvorene kategorije.

Kategorija Praktično znanje podrazumijeva dvije potkategorije: upravljanje Twitterom i praktično poznavanje resursa i mrežnih alata. Praktično znanje izravno je povezano s učenjem upotrebe tih izvora i alata u razredu. Druga poveznica vrijedna spomena jest usvajanje komunikacijskih vještina koje su praktično znanje (učiti komunicirati putem Twittera) i opće znanje koje je korisno u budućoj profesiji (učiti raspravljati u skupini).

Druga je kategorija Opće znanje koje se odnosi na usvojeno znanje koje ne podrazumijeva nužno specifičan akademski cilj, ali je vrlo koristan u daljnjem profesionalnom razvoju učitelja. Ova kategorija podijeljena je u tri potkategorije:

– konceptualno znanje: usvajanje opće terminologije o društvu, tehnologiji i društvenim mrežama
– kognitivno znanje: usvajanje kognitivnih vještina vezanih uz izradu sažetaka, refleksiju ili raspravu
– znanje vezano uz primjenu u razredu koje, s jedne strane, predstavlja praktično učenje, a s druge je strane povezano s nastavnim materijalima i korisnim alatima koji se mogu koristiti u razredu.

Specifično znanje odnosi se na usvajanje sadržaja vezanog uz specijalnost i uz predmet: akademsko i stručno znanje.



Prikaz 2. Konceptualno: Vrsta usvojenog znanja i poboljšanje akademskog osposobljavanja

Studenti su utvrdili tri vrste znanja koje su usvojili sudjelovanjem na Twitteru: specifično, opće i praktično.

Studenti su izjavili da su usvojili specifično znanje izravno povezano s akademskom specijalizacijom unutar diplomskog programa u koji su uključeni (Ekonomija i Poslovno upravljanje, Filozofija, Fizika i Kemija, Geografija i Povijest; IT, Španjolski jezik i književnost, Francuski, Engleski, Talijanski) i sa specifičnim znanjem povezanim s kolegijem Izrada i razvoj kurikula, znanjem vezanim uz inovativne metode poučavanja u razredu, specifične didaktičke metodologije koje su im pokazale kako motivirati i kako poučavati primjenom društvenih mreža (edmodo, Twitter, itd.), igrifikacija, među ostalim, upotreba metodologije kombiniranoga učenja (blended learning) poput obrnute učionice (Flipped classroom). Obje vrste znanja (specifično i predmetno) studenti su doživjeli kao korisne u budućoj profesiji. Mišljenje studenta pod brojem 296 ukratko sažima te ideje:

> „U isto vrijeme, s obzirom na prirodu aktivnosti, usvojio sam različite vrste teorijskog znanja ne samo (…) o predmetu, a s Twitter zadatkom, s obzirom na puno mojih objava o didaktici i pedagogiji, korist je dvostruka jer sam dijeleći svoje znanje produbljivao i učenje. U tom smislu refleksije o motivaciji učenika, ulozi nastavnika, aspekte primjene Twittera pa čak i teorijski sadržaj za učenje latinskog bili su vrlo važni" (S296).

Procjena studenata o usvajanju općeg znanja vezanog uz različite aspekte također je vrijedna spomena: usvajanje konceptualnih značajki (društvene mreže, društvo i tehnologije), primjena društvenih mreža u sekundarnom obrazovanju upotrebom različitih didaktičkih resursa raspoloživih na mreži [„Aktivnost mi je omogućila da razvijem dubinsko znanje o integraciji IKT-a u obrazovanje (...) Naučio sam (...) kako razviti inovativnu aktivnost koristeći se IKT-om" (S289)] i s razvojem kognitivnih vještina poput refleksije, sinteze ideja i raspravljanja, integriranje različitih perspektiva. [„(...) Izdvaja se važnost znanja kako odabrati, usporediti i filtrirati neizmjernu količinu informacija dostupnih na internetu jer su to vještine koje tom aktivnošću mogu primijeniti u praksi i poboljšati (...)" (S283)]

Na kraju, studenti su procijenili usvojenost praktičnog znanja povezanog s razvojem praktičnih vještina poput upotrebe digitalnih alata i izvora, a posebice se to odnosi na proučavanje Twitter društvene mreže. Studenti su naglasili da su naučili uzajamno djelovati, sudjelovati, dijeliti i razmijeniti informacije putem Twittera, što im je omogućilo i da osnuju zajednice koje dijele interese. Proces komunikacije omogućio im je interakciju, upoznavanje drugih, stvaranje veza, poboljšanje percepcije grupa, a razmjena informacija pomogla im je da ostanu u tijeku događanja jer su morali pretraživati i objaviti različite dokumente i vijesti, kao i čitati i konzultirati se s porukama koje su drugi objavili. Mišljenje studenta broj 96 sažima navedene ideje:

> „(…) usvojili smo znanje o društvenim mrežama jer smo se prije te aktivnosti koristili Twitterom kako bismo pratili ljude koji su nas interesirali i tako smo analizirali njihove objave, međutim, sada smo proširili mogućnosti te društvene mreže te smo podijelili sadržaj, publikacije koje su nam se svidjele i koje smo željeli podijeliti, podijelili smo objave drugih iz naših profila, napravili smo popise ili zajednice ljudi s istim interesima te smo se koristili poznatim hashtagom kako bismo grupirali sve informacije vezane uz specifičnu temu i omogućili pretraživanje sadržaja" (S96).

Rasprava

Svrha ovoga istraživanja bila je proučiti utjecaj sustava vrednovanja na akademsko postignuće s obzirom na primjenu aktivnosti utemeljene na društvenim mrežama (Twitter), kao i utjecaj percepcije studenata o novonastalim odnosima i akademskom napretku.

Kao i u drugim istraživanjima (Arribas, 2012; Ebhomien i sur., 2012; Moreno, i sur., 2017; Samiullah i Anjum, 2017; Zaragoza i sur., 2009) zaključili smo da kontinuirano vrednovanje unapređuje ishode učenja.

Kod Mogućnosti A proces učenja utemeljen je na četiri aktivnosti koje su povezane sa silabom, a nakon svake teme slijedio je ispit vezan uz temu iz silaba (tema 6). Stoga je većina tema vrednovana putem uključenosti u aktivnosti. Za razliku od toga studenti koji su odabrali Mogućnost B, bili su uključeni u samo jednu aktivnost (koju su odabrali između ponuđene 4 aktivnosti), a u testu su odgovarali na pitanja iz svih

tema navedenih u silabu. Većinu vremena studenti su posvetili učenju, s fokusom na ispit koji se sastojao od pitanja esejskog tipa.

S jedne strane zaključeno je da bi kontinuirano vrednovanje trebalo uključivati dva aspekta koje naglašava Muskin (2017), formativno i sumativno vrednovanje. Kao što tvrde Nicol i Macfarlane-Dick (2006) te Weaver (2006), kontinuirano vrednovanje potiče napredak u učenju i postupnu asimilaciju sadržaja, pod uvjetom da nastavnik dodatno potiče učenje tijekom tog procesa. U kolegiju Izrada i razvoj kurikula nastavnici i tutori osigurali su praćenje i podršku tijekom CAT odgovarajući na pitanja i dajući studentima smjernice kako bi im pomogli u ostvarivanju ciljeva i u napretku u učenju (formativno vrednovanje). Nadalje, vrednovanje postignuća uzelo je u obzir i rezultate iz testova koji su činili dio konačne ocjene te su bili dodatak ocjenama dobivenih iz aktivnosti i iz kontinuiranog vrednovanja, što je značajka onog što Fraile, López, Castejón i Romero (2013) smatraju ključnim za učinkovito kontinuirano praćenje. Ukratko, konačno, sumativno vrednovanje, kombinira ocjenu dobivenu iz ispita s ocjenama dobivenima sudjelovanjem u aktivnostima, a svaka nosi 50 %, što potvrđuje status studenta i omogućuje daljnji napredak putem sustava.

S druge strane, nekoliko je autora (Arribas, 2012; Delgado i sur., 2005) izjavilo da je kontinuirano praćenje proces koji može biti učinkovit samo ako je usvojen na osnovi planiranoga cilja, a ne kao rezultat niza izoliranih i improviziranih testova. Zbog toga je prisutan još jedan aspekt koji je odgovoran za uspjeh procesa kontinuiranoga praćenja, a to je planiranje izvedbe predmeta jer je organiziran u dosljedno i unaprijed planiran uzimajući u obzir satnicu, sadržaj kolegija i ishode učenja.

Nadalje, vezano uz utjecaj Twitter aktivnosti na postignuće, rezultati su slični onima iz drugih istraživanja: postoji pozitivna povezanosti između sudjelovanja u aktivnosti microblogging i studentskih postignuća (Hull i Dodd, 2017).

Kao što navodi Durak (2017), obrazovni potencijal društvenih mreža ne bi se smio zanemariti.

Moguće je da kada se studenti uključe u tu aktivnost, da njezin utjecaj na postignuće u ispitu može biti rezultat motivacije i zadovoljstva koje je student pokazao dok je sudjelovao u aktivnosti na Twitteru. Studenti smatraju da je iskustvo bilo pozitivno ne samo sa stajališta obrazovanja, za usvajanje teorijsko-praktičnoga znanja, nego i kao način razvijanja međuljudskih odnosa s drugim studentima i u stvaranju zajednica studenata istih interesa. Tako su potvrđeni rezultati koje su dobili drugi znanstvenici: studenti su pozitivno ocijenili korist Twittera kao prostora koji potiče stvaranje zajednice (Bligh i sur., 2017; Carpenter i Krutka, 2015; Gunawardena i sur., 2009), kao alata za razmjenu informacija (između ostalih Veletsianos i Navarrete, 2012) i kao način socijaliziranja i komuniciranja (Cheung i sur., 2011; Dabbagh i Kitsantas, 2011; Kabilan i sur., 2010; Quan-Haase i Young, 2010; Wodzicki i sur., 2012; Tang i Hew, 2017; Yu i sur., 2010).

Može se zaključiti da motivacija i zadovoljstvo sudjelovanjem u Twitter aktivnosti može biti posredna varijabla koja potiče bolje postignuće. To otvara nove pristupe

za analizu koji mogu potvrditi ili opovrgnuti rezultate iz ovoga istraživanja. Bilo bi interesantno nastaviti ovo istraživanje kako bi se mogli analizirati učinci sudjelovanja na Twitteru kao način poticanja obveza i uključenosti studenata, kao što su neki autori već učinili (Junco i sur., 2010; Jones i Baltzersen, 2017; Liu i sur., 2017; Tur i Marin, 2015) ili poput Santoveña (2017) i Zappavigna (2011) istražiti postojanost novonastalih zajednica kako bi se odredila vrijednost sudjelovanja u mreži, ili kao način iskazivanja emocija kao što su istražili Greenhow i Robelia (2009).

Nadalje, rezultati pokazuju da studenti smatraju da je sudjelovanje na Twitteru imalo pozitivan učinak na međuljudske odnose, stvaranje zajednice studenata istih interesa, i na poboljšanje akademskog postignuća u vidu usvajanja znanja i poboljšanja općeg i/ili specifičnog osposobljavanja. Međutim, zaključeno je da pozitivne percepcije studenata (međuljudske i akademske) nisu značajno utjecale na postignuće.

Tome zaključku dodajemo da pozitivna percepcija o boljem akademskom postignuću (usvajanje znanja i opće i/ili specifično osposobljavanje), kao i odnose s drugim studentima, zajedno s percepcijom o zajednici s istim interesima, treba razmotriti kao motivacijsku varijablu i moderatora u postignuću koji bi se trebali uzimati u obzir kod izrade didaktičkih aktivnost jer oni studenti koji smatraju da su te varijable imale pozitivan učinak na postignuće, imaju i bolje rezultate u Twitter CAT i u ispitu. Moglo bi se reći da postoji tendencija prema pozitivnoj (međuljudskoj i akademskoj) percepciji boljeg postignuća te da je to varijabla koja bi se trebala uzeti u obzir kao prediktor ishoda učenja, a to su pokazala i druga recentna istraživanja (Lopez- Perez i sur., 2011; Marinović, 2014; Owston i sur., 2013; Ullah i Yasmeen, 2017). Da bi se taj trend potvrdio, bit će potrebna daljnja istraživanja.

Studenti naglašavaju mogućnost pristupa novostima, resursima i sadržaju povezanom s njihovom specijalnošću, s temama koje se obrađuju u kolegiju i sa sadržajem vezanim uz primjenu IKT-a u nastavi. Nadalje, istraživanje je pokazalo da su studenti koji su izjavili da je znanje koje su usvojili uglavnom teorijsko, imali bolje rezultate iz ispita, sa značajnim razlikama u odnosu na druge dvije skupine (praktično i teorijsko-praktično). Studenti koji su procijenili da je usvojeno znanje teorijsko, vjerojatno su posvetili više vremena čitajući i pregledavajući sadržaj dobiven iz poruka koje su slali njihovi kolege studenti te iz samih tweetova. To objašnjava zašto su ti studenti imali bolja akademska postignuća u usporedbi sa studentima koji su procijenili da je usvojeno znanje uglavnom praktično i čiji je pristup Twitteru bio više pragmatične prirode, a manje refleksivne. Zaključeno je da je moguće usvojiti znanje putem Twittera, ali učinkovitost te metode ovisi o stavu studenta prema zadatku, kao i o naputku za provedbu didaktičke aktivnosti.

Jedan od najznačajnijih aspekata na koje su studenti ukazali jest njihovo pozitivno vrednovanje Twitter aktivnosti, kao i različite mogućnosti koje su im ponuđene kao budućim učiteljima. Mišljenje studenta pod brojem 105 (S105) sažima dodanu vrijednost koju nude društvene mreže u području obrazovanja:

> "(…) ugodno me je iznenadilo što sam sve mogao učiniti koristeći se Twitter društvenom mrežom. Kada sam se upustio u tu aktivnost, bio sam prilično skeptičan i nisam mislio da će mi to toliko pomoći kao budućem učitelju. Međutim, upoznao sam mnoge tehnike i vidio mnoge ideje o načinima upotrebe društvenih mreža u nastavi. Otkrio sam mnoge načine upotrebe tih alata u nastavi engleskoga jezika (…)" (S105)

Za akademsku godinu 2017./18. nastavnici kolegija isključivo će primjenjivati kontinuirano praćenje zasnovano na aktivnostima učenja; odnosno, studentima će biti ponuđena samo Mogućnost 1, s obzirom na to da je učinkovitija sa stajališta učenja. I dalje će im biti ponuđene različite vrste aktivnosti, ali će sve uključivati sudjelovanje na Twitteru u konačnoj fazi jer se smatra motivacijskim okruženjem koje može potaknuti akademske obveze kao što to tvrde Jones i Baltzersen (2017), neformalna i/ili formalna komunikacija prema istraživanju (Dabbagh i Kitsantas, 2011; Tang i Hew, 2017), kao i interakciji nastavnika i studenata prema nalazima Preston i sur. (2015). Aktivnosti će biti izrađene na osnovu „push" tehnologije koju opisuju Tang i Hew (2017), gdje nastavnik inicira komunikaciju slanjem pitanja i rasprava o temama koje potiču proces refleksije i rasprave putem Twitter mreže. Postavljanje pitanja za refleksiju i raspravu putem microblogginga, zajedno s izmjenom resursa i novosti može izgraditi didaktički pristup koji dopušta razvoj različitih oblika učenja.

Ukratko, formativno vrednovanje ostvarilo je funkciju vođenja, reguliranja učenja i motiviranja studenata tijekom semestra, a sumativno vrednovanje pomaže u provedbi integracije, napredovanju i akreditaciji. Zajedno je implementiran uspješan proces kontinuiranoga vrednovanja koje uz društvene mreže pomaže studentima u učenju.

Zaključci

Hipoteza 1 je potvrđena: akademsko postignuće studenata koji su se odlučili za kontinuirano vrednovanje učenja posredstvom zadatka (Mogućnost A) bilo je bolje od studenata koji su se odlučili za Mogućnost B – mogućnost zasnovanu samo na postignuću iz ispita. Hipoteza 2, da sudjelovanje na Twitteru ima pozitivan učinak na postignuće studenata, također se može potvrditi, iako se priroda te povezanosti i stupanj učinkovitosti mora dalje analizirati u budućim istraživanjima s obzirom na to da nije bilo značajne Spearmanove korelacije između ocjena dobivenih u Twitter CAT i onih iz ispita. S obzirom na te rezultate, zaključeno je da je važno uzeti u obzir potencijal društvenih mreža kada se izrađuje kolegij na diplomskom sveučilišnom studiju.

Nadalje, nije moguće potvrditi hipotezu 3 i 4. S jedne strane rezultati su pokazali da su studenti koji su mišljenja da je sudjelovanje u Twitteru poboljšalo njihove međuljudske odnose i osnovalo zajednicu sličnih interesa, imali i bolje akademsko postignuće, međutim, značajne razlike nisu potvrđene, stoga se hipoteza 3 ne može potvrditi. S druge strane, studenti koji su mišljenja da im je sudjelovanje na Twitteru pomoglo u usvajanju znanja i/ili akademskom osposobljavanju, imali su i

bolja postignuća, ali značajne razlike nisu uočene, što ne čini mogućim potvrđivanje hipoteze 4.

Može se zaključiti da se pozitivne procjene studenata o doprinosu Twitter aktivnosti za njihovo akademsko postignuće, koje je pokazala i kvantitativna analiza, također reflektiraju i u kvalitativnoj analizi koja je pokazala da su studenti izdvojili tri vrste znanja koje je potaknuto sudjelovanjem u Twitter aktivnosti kao način usvajanja znanja, posebno teorijsko-praktičnog znanja.

Na kraju, istraživanje je potvrdilo da je većina tweetova koje su studenti dijelili bila originalna (izravna) s poveznicama, a ne rezultat retweetanja, što je povezano s onim što su rekli o usvajanju znanja konzultirajući se s poveznicama koje su podijelili njihovi kolege. Ti rezultati odražavaju se i u kvalitativnom istraživanju koje je pokazalo da studenti visoko vrednuju usvajanje znanja konzultirajući se s informacijama sadržanima u porukama koje su podijelili kolege studenti, drugi tweeteri i konzultirajući se s novosti koje dijele poslije.