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Student engagement and foreign language learning through online social networks

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Abstract

Introduction: Nowadays, one of the most important questions in teaching and learning involves increasing the degree of students' engagement in learning. According to Astin's Theory of Student engagement, the best learning environment is one in which it is possible to increase students' engagement. The current study investigates the influences that using these networks for educational purposes may have on learners' engagement, motivation, and learning.

Results: By a detailed comparison of a control group using face to face education and an experimental group using the social network Facebook, this study found significant differences between the two groups in terms of learning, engagement and motivation. The Facebook group showed higher outcomes in the TOEFL post-test than the face to face group with no differences in the pre-test. The Facebook group report significantly higher levels of engagement and motivation after the course than the face to face group.

Conclusion: Engagement was related to learning outcomes in the Facebook group, but not in the face to face group. Also the results of the Facebook group supported Astin's theory (the fourth principle: 'Development is proportional to quantity and quality of involvement' and fifth principle 'The effectiveness of any educational practice is directly related to the ability of that practice to increase student engagement'). No correlation between engagement and motivation was found. The discussion focuses on the role of engagement in learning.

Keywords: Social media, Foreign language learning, Engagement

Introduction

Today, online social networks receive worldwide attention of researchers because they are used for intensive interaction in various activities and fields (Silius et al. 2010). These networks allow users to communicate in a variety of networks that connect with family, friends, and colleagues (Lenhart & Madden 2007).

In recent years, these networks have brought a revolution in the field of communication (Espuny et al. 2011), and sharing of information and knowledge (Grosbeck 2009), especially among the younger generation, many of them students in Higher Education (Brady et al. 2010; Hamid et al. 2009). Numerous universities and colleges have established their own profiles and groups in these networks (Selwyn 2011) in order to provide their students with a platform in which they can communicate, engage in academic-related activities, and exchange ideas, documents and information. Many

researchers in the fields of information technology and (language) education believe that besides their public use in teaching, online social networks can be especially useful and conducive to the improvement and promotion of language skills (Baralt 2009; Godwin-Jones 2006; Harrison & Thomas 2009; Lomicka & Lord 2009), specifically in the teaching and learning of foreign languages and cultures.

According to (Motteram & Sharma 2009), social networks can not only be a constructive and valuable tool for language teachers, but they also can help students to learn more effectively, that is, to attain a more solid and practical linguistic competence in various contexts of language use. Besides providing an appropriate environment for collective learning and content sharing in various forms (pictures, text, videos, internet links, etc.), online social networks also have the potential to provide for the communication and interaction in foreign languages, since they can provide an engaging learning environment by crossing physical borders between institutions and bring together large groups of students belonging to various geographical areas, cultures, religions, practices and perceptions.

Since a large number of the current world population of students is interested in learning and interacting in one or more foreign languages for scientific, cultural or political, economic exchange, and since physical access to native language speakers is rather hard or impossible for the students of many countries, these networks should receive considerable attention and usage for interactive, authentic and interesting access to native speakers and documents in various languages. Brick (2011a) argues that one cannot ignore the power of online social networks in learning languages because by using the distinctive features of the networks, improving various contextualized linguistic skills, such as reading, writing, listening, and speaking may become possible. These distinctive features include: the combination of Internet-based communication instruments and Web 2.0 tools (Malhiwsky 2010) such as web pages, chats, group work, blogs, group and individual messaging and e-mail, commenting and private messaging between users (Heiberger & Harper 2008). As a result, students' engagement and motivation can increase, which can lead to more fruitful and practical language learning experiences. However, there is not much theory-based research on the involvement and learning outcomes of students using these new social networks for second language learning. Thus, this is the focus of this study.

Student involvement theory and facebook

The theory of college student involvement was developed by Alexander Astin in 1984 and then was renamed by him as the "Engagement Theory", where engagement is defined as "the amount of physical and psychological energy that the student devotes to the academic experience" [(Astin 1993) p. 297]. Engagement and involvement will be used as synonyms here. According to this theory, an active student is a student who devotes considerable energy to studying, is usually active in the university, and has communication and interaction with other students and teachers (Astin 1984). In fact, this theory states that a more successful student is one who has more engagement, and the higher the engagement, the more the learning (Astin 1984). This theory puts emphasis on active participation in the process of learning (Astin 1984). Astin's student involvement theory has five basic tenets, which can be used for the assessment of students' level of participation in a

specific experience. For the purposes of this paper, the focus is on the last two tenets. The five tenets are as follows:

- 1.) *Involvement Requires Physical and Psychological Energy*. This tenet states that “involvement refers to the investment of psychological and physical energy to various objects [(Astin 1993) p.519]. Given the various research findings about the prominent degree of online social networks as used by students (Ajjan & Hartshorne 2008; Davies 2012; Greenhow et al. 2009), it can be claimed that students are deeply involved in online social networks; they use both physical and mental energy when using these networks. Therefore, designing and developing different academic courses using online networks, such as for foreign languages, can increase student involvement such as the student-student and student-teacher interactions and communication for learning activities.
- 2.) *Involvement Occurs Along a Continuum*. This tenet asserts that “students will invest varying amounts of energy” in different areas [(Pascarella & Terenzini 2005) p. 53]. This tenet refers to students’ different amounts of activities, in other words that some students are more active than others or devote more time to a specific activity than their fellow classmates. This tenet can be applied to the study of online social networks because first, preplanned performing activities in online social networks seem to constitute a continuum, and second, a great number of students have active presence in the environment of online social networks and spend a considerable amount of time using them, or in the words of Boyd (2007) that students live within these networks. It seems that because of the facilities and features of online social networks (participative and interactive–led involvement inclined to produce high-quality work), it may be expected that students become more connected to the world outside their classroom, which promotes more genuine interaction with various resources, coaches, peers and experts. Within the interactive environment of online social networks, students may work together with peers from their class or from other courses both within and outside the regular class hours. Interaction, communication and collaboration between students and teachers may contribute to a more productive content construction within communities with different (linguistic) needs. In this way, students’ involvement can increase along the continuum, and they can learn to communicate with other groups within this continuum, by engaging in synchronous and asynchronous communication with their fellow peers. Engagement in social networks will vary for different students as well as within courses per student.
- 3.) *Engagement has both Quantitative and Qualitative Features*. This tenet suggests that students perform activities at different points in time and these activities can be measured both by quantitative and qualitative methods (Astin 1984), for example, the number of hours they have been studying can be investigated as well as the mental energy they spend. As stated earlier, when using online social networks, students spent both physical and mental energy in their activities. Some of these activities may be measurable by qualitative methods while measurement of other activities rely mostly on quantitative methods.

- 4.) *Development Is Proportional to Quantity and Quality of Involvement.* This tenet suggests that students' learning in a program is proportional to the quality and quantity of their involvement in that program. This tenet might also be generalizable to the environment and activities in online social networks, and to different kinds of learning activities, whether web-based or non-web-based, because this tenet suggests that both the quantity and the quality of students' involvement can be expected to influence their learning. Thus, a relation is expected between quality and quantity of engagement and learning outcomes.
- 5.) *The Effectiveness of any Educational Practice Is Directly Related to the Ability of that Practice to Increase Student Engagement.* Different studies (Baralt 2009; Lomicka & Lord 2009; Brick 2011b; Mills 2009) indicate that using online social networks increases students' active participation in various learning activities. In addition, there exist, in these networks, numerous web pages that correspond to different fields of teaching and subjects. A brief overview of the literature indicates high levels of students' participation in such activities. Rosenshine (1982) argues that the greatest amount of learning will occur when a learning environment is designed in a way that it encourages students in active participation and interaction. Therefore it is expected that online social networks will provide effective educational practices because of the opportunities they provide to increase student engagement. However, there is no previous empirical research to support this.

In the current research, the focus is on the last two tenets of Astin: development of quality and quantity of engagement and effectiveness. One other aspect is added to this: motivation. Motivation is defined as a set of interrelated beliefs and emotions that influence and direct behavior (Green et al. 2007; Martin 2008; Wentzel 1992). Engagement is defined as students' involvement in activities and conditions that is likely to generate high quality learning (Ball & Perry 2011). Motivation relates to emotions and beliefs and engagement relates to (mental) activities. As mentioned above, the theory of Astin only refers to students' engagement, while in the process of learning; motivation is also an important variable, along with engagement, in learning (Bandura & Walters 1963; Becker 1964; Chan & Ahern 1999; Weiner 2000). In the study reported here, the focus will be on the motivation theory of Ryan and Deci (2000). This is one of the most popular approaches towards motivation these days. According to Ryan and Deci's Self-Determination Theory (Ryan & Deci 2000), students who were highly motivated also demonstrated that they had more engagement in their learning processes. Zyngier also (Zyngier 2011) argues that increased motivation in students promotes engagement. Engagement coupled with motivation is considered very important for enhanced learning outcomes of all students (Schlechty 2001; Woolfolk & Margetts 2007). Increased motivation may therefore be expected to lead to an increase in engagement (Malhiwsky 2010). Despite the emphasis put on the relation between motivation and engagement, in the relevant literature studies investigating both variables simultaneously are scarce.

Some research for example has indicated that using social media as an educational tool can lead to increased student engagement (Annetta et al. 2009; Chen et al. 2010; Dunne et al. 2012; Junco 2012; Patera et al. 2008). Other researchers (Baker et al. 1990; Boster et al. 2002; Dwyer 1994; Reynol 2012; Swan et al. 2005) argue that using technology influences students' motivation in a positive way. Moreover, different studies

(Mills 2009; Blattner & Fiori 2009; Kabilan et al. 2010; Mazer et al. 2007; Ross et al. 2009; Wise et al. 2011; Mazer et al. 2009) indicate that specifically using the social network Facebook will considerably increase motivation in the process of learning.

Evidently, the relation between engagement and motivation has not been studied in detail. Specifically, the relationship between these two variables has not been studied in the context of social networks. Online social networks seem to play an important role in stimulating active student participation and interaction, given the facilities and features mentioned above. According to other authors (Dixon & Black, ;1996; Routman 1991), the distribution of student work increases motivation in students; online social networks provide many opportunities for students to distribute their work that can have many pedagogical advantages and implications.

Summarizing, based on Astin's theory (Astin 1993), the most successful students are those who demonstrate more engagement in the process of learning as well as in the learning environment. The importance of any educational strategy or practice is highlighted if it can increase students' engagement, since an increase in engagement will result in more effective learning (Astin 1993). In our perspective, the environment of social networks paves the way for the enhancement of engagement as well as motivation so that the use of this online learning and teaching may be expected to bring about considerable and positive results in regards to learning outcomes.

Research questions

The current study therefore aims at evaluating the effectiveness of using the social network Facebook in the field of learning English as a second language by university students. It focuses on the influence of this online network on the processes of learning, on motivation and on the degree of students' engagement. The *general research question* in this study is the following:

Are there any differences in language learning between a Facebook group and a face to face group? If there are, what are the differences in language learning between a Facebook group and a face to face group?

In particular, the following sub questions are considered and analyzed:

1. Are differences observed in terms of students' learning outcomes achieved by a Facebook group and those produced by a face to face group? If there are, what are these differences?
2. Are there differences between a Facebook group and a face to face group in the process of (language) learning in terms of students' intrinsic motivation and engagement? If there are, what are these differences?
3. What kinds of activities and processes influence the observed learning outcomes?
4. Are there differences between the views of a Facebook group about the use of online social networks in language learning before and after the course? If there are, what are these differences?

Method

This study is a quantitative field experiment with non-randomized-control group-design with a pre-test and a post-test: an online social network group as experimental group and a traditional face to face group as control group.

Participants and sample

The sample consisted of Iranian PhD students living in Schengen zone countries: a group of 40 individuals, between ages of 25 and 35 (Table 1), with an intermediate command of the English language was selected. These students were then divided into two groups of 20 based on the following criteria: the first group (the experimental group, which used Facebook for language learning) consisted of students living in different Schengen zone countries such as Germany, Denmark, Belgium, Netherlands, Sweden, Norway, and France; the second group (the control group, which attended face-to-face meetings for language learning) included Iranian students living in different Dutch cities, especially in Utrecht. Forty-five percent of students divided into the two groups were women while 55 % were men (Table 1). Table 2 shows the ages of the students in the two groups. It is important to note that there was no random assignment to the two groups and the groups differed in countries they lived in. Possible disturbing differences between the groups could be checked via measurements at the beginning of the courses (see the results of the check in the Check on pre-existing differences between the groups section).

The teachers were different, but both were native speakers and experienced male teachers. They were the same age (27) and had similar teaching experience.

The intervention in the experimental and the control group

The experimental procedure, the intervention in the facebook group

The experimental group was involved in the English language course for 1 h a day, during 1 month (except for the weekends) through 20 formal teaching on-line sessions via a group page, created in Facebook as well as Skype. These sessions consisted of participating in different conversations and/or interactive activities with the male teacher (a native speaker of English) and classmates. Students had to interact and perform different assignments on the group's wall on Facebook. Each student had to write a short paragraph on a daily basis, on a specific subject, and then to post it on the group's wall. Students were permitted to use any kind of support instruments and/or educational resources available to them on the wall of the group or in their peers' posts and feedback. These support instruments and resources mainly consisted of pictures, videos, links, etc. Alongside these online interactions, students were permitted to raise various questions that dealt with the assigned activities, to which other students and/or the teacher responded. Moreover, when appropriate, students shared with others what they considered to be interesting or useful in relation to the material studied.

At the beginning of the course, a page was created in Facebook titled "Teaching English to Persian Students". The teacher and students were enrolled in the page in which they were required to perform the activities asked by the researchers. The purpose behind creating this page was the establishment of increased communication and interaction among students and between students and teacher, the performance of the

Table 1 Group with Gender Cross tabulation

		Gender		Total
		Male	Female	
Group	Facebook	11 (55.0 %)	9 (45.0 %)	20
	Face to face	9 (45.0 %)	11 (55.0 %)	20

Table 2 Group with Age Cross tabulation

		Age		Total
		25–30	30–35	
Group	Facebook	11 (55.0 %)	9 (45.0 %)	20
	Face to face	15 (75.0 %)	5 (25.0 %)	20

assignments and the production of peer feedback by students. These students were encouraged to have interactions with their classmates and to give feedback to each other. Students were permitted to use any kind of support instruments and/or educational resources available to them on the wall of the group or in their peers' posts and feedback. Furthermore, the experimental group was exposed to the English language for 1 h a day, during 1 month (except for the weekends) through 20 formal teaching sessions via Skype. Every day, the teacher called students via Skype at a specified time in the evening. The class began with conversations between the teacher and students. Then, the teacher started teaching and at the end of the class, the students were assigned some tasks to perform in Facebook till the next day. It should be mentioned that these tasks included uploading the answers to the exercises which were placed at the end of each book lesson. In this educational English language course, all participants in both groups used a popular book to learn English entitled '*Face2face*' (Redston & Cunningham 2006); both teachers also organized their lesson plans and activities according to this book as much as possible in the same ways. Each lesson of the book included four sections (A, B, C, and D). Students were to study two pre-determined sections 1 day before participating in class activities and/or raising questions. The teachers in both groups selected some exercises as well, and asked students questions about them. Moreover, they explained ambiguous grammar points and clarified the necessary linguistic concepts when needed. The instructors also taught students one figure of speech per day. In general, the first part of each session was spent on conversations among students, concerning different issues, during which students not only exchanged ideas and opinions, but also gave feedback to each other. The second section of the class was dedicated to answering students' questions, removing any remaining ambiguities and teaching important linguistic concepts. The last section was spent on speaking about students' assignments.

The intervention in the control group

However, in the control group, which did not receive any instruction via Facebook, students' assignments were studied and commented by peers during class time inside the classroom, which is why an extra 40 min was added to each session in addition to the specified 1 h of instruction and in-class interaction. In this group, in each class session, students were divided into groups of four to five, in which they exchanged assignments with classmates and gave and received feedback to and from one another for 20 min. During the next 10 min, they discussed the given and received feedback. The last 10 min were spent on students' questions for the teacher regarding their assignments. The experimental and control group were comparable in terms of teaching content (the same chapters, assignments, tests etc.) and in the number of formal teaching sessions, they were different in the country of living (see above). There were also some differences in time expenditure:

The students in the experimental group were stimulated to give each other feedback through posts on the Facebook wall between the 'teacher led meetings'. However, in the control group, since they did not use Facebook, students' assignments were studied and commented by peers during class time inside the classroom, which is why an extra 40 min was added to each session in addition to the specified 1 h of instruction and in-class interaction.

Data collection and data analysis, research instruments

For the purposes of this quantitative field experiment, the following research instruments are used:

TOEFL pretest and posttest

Prior to the beginning of the course, as well as after the course's completion, all participants were administered a pretest and a posttest; the standard tests of English as a Foreign Language (TOEFL) were used in order to investigate students' learning levels in the beginning and to measure students' linguistic outcomes. The TOEFL test is a highly reliable English proficiency test. The test measures the ability to use and understand English at the university level. And it evaluates how well one combines one's listening, reading, speaking and writing skills to perform academic tasks. It consists of listening, speaking, reading and writing questions. These four sections have 120 (multiple choice) questions in total. The total reliability was 0.94 (Educational Testing Service 2011). Reliability coefficients for the parts of the test were 0.85 for Reading, 0.85 for Listening, 0.88 for Speaking and 0.74 for Writing (Educational Testing Service 2011). The scores were converted to the levels 1–5 according to the standardized procedures of TOEFL (Educational Testing Service 2011).

Questionnaires

Intrinsic motivation inventory The Intrinsic Motivation Inventory (IMI) is a multidimensional measurement device developed for evaluating participants' subjective experience associated with a target activity in laboratory experiments, based on Self-determination theory (Ryan & Deci 2000).

It is easily available via the SDT website (Deci & Ryan 2011). It has been utilized in several experiments concerning intrinsic motivation and self-regulation.

IMI has been tested for separate use of some subscales and here only two subscales of this questionnaire are used, which assesses intrinsic motivation. The interest/enjoyment subscale is considered the self-report measure of intrinsic motivation; and effort/importance is a separate variable that is relevant to some motivation questions.

The interest/enjoyment: this scale contained four items. A reliability test on the seven items revealed a good internal consistency ($\alpha = .97$).

The effort/importance: this scale contained three items. A reliability test on the seven items revealed a good internal consistency ($\alpha = .88$).

Competence questionnaire All participants answered a set of questions, called "Competence Questionnaire" before and after the course: This questionnaire, which consisted of nine items, was developed to measure students' feelings of competence

when studying. Sample items are: "I don't have any idea about how to go about learning the English language" and "My English language learning aptitude is high." There were 5 possible answers: 1 = totally disagree, 4 = totally agree, 0 = no comment) scale. A reliability test revealed an acceptable internal consistency ($\alpha = .79$).

Measuring engagement

The online social network Facebook records and shows all the activities performed by participants. The recorded daily Facebook pages activities were then saved in pdf formats. To ensure that all students' activities on Facebook were recorded, researchers checked the relevant Facebook pages hourly and asked students not to delete their different feedback statements and activities. The face-to-face classroom data were observed directly as well as recorded by a video recorder, and the students delivered to the researchers their writings of the day before along with the feedback given to them.

Therefore, the data gathered from the face to face group were based on both feedback on the students' assignments, the direct observations of classroom activities and watching classroom videos by the researchers. It should be noted that the activities included the feedback, homework, questions, and other activities. Six researchers were involved in the coding of the participants' engagement. First, these researchers were divided in two groups and asked to count the activities of each student in the Facebook group, as well as in the face to face group, during the first 3 days. So, only the total number of activities per student are used. The results of the two groups were compared to calculate the inter-rater-reliability (Cohen 1960). The coefficient Kappa was 0.79.

Using social networks in learning language questionnaire

With regard to the theory of acceptance model technology, a questionnaire was made by the researchers that has two subscales:

1. The ease of using online social networks: The scale contains six items. A sample item is "It is easy to get online social networks to do what I want it to do. Using the online social networks does not require a lot of mental effort". A reliability test on the six items of this subscale revealed an acceptable internal consistency ($\alpha = .82$).
2. The usefulness of using online social networks for foreign language learning: This subscale contains ten items. A sample item is "Using online social networks gives me more chances of practicing English. Communicating using a social network is a good way to improve my English". A reliability test on the ten-item subscale revealed an acceptable internal consistency ($\alpha = .90$).

Interview

Participants in both the experimental and the control groups were interviewed and asked a series of open and closed questions in the middle and at the end of the course. These questions mainly consisted of the positive/negative experience with using Facebook in learning language, their attitude toward that Facebook as an educational tool, increase of the motivation/increase of involvement, and their opinions about the improvement of their learning and skills. We interviewed both groups about their use of

Facebook, because we wanted to check that they did use these networks for learning and to see whether they used Facebook for general (non-learning) purposes.

Because these data result from interviews Chi-square was used for analyzing the data.

Results and Discussion

Check on pre-existing differences between the groups

Since the groups were not assigned randomly, it was needed to check whether the groups differed before the education took place. There were three kinds of data available: the TOEFL test, the competence questionnaire and demographic variables such as age, sex and discipline of the PhD students. On the TOEFL pre-test the means and standard deviations were $M = 2.25$; $SD = 0.55$ for the face to face group and $M = 2.08$, $SD = 0.44$ for the Facebook group. There was no significant difference between the experimental group and the control group ($t(38) = -1.11$; $p = .27$).

For the competence questionnaire the means and standard deviations at pretest time were $M = 2.51$, $SD = 0.34$ for the Facebook group and $M = 2.34$, $SD = 0.42$ for the face to face group. This difference is also not significant ($t(38) = 1.36$; $p = 0.18$). Furthermore, there were no differences in the number of men and female in the two groups (see Table 1): nine men and 11 women in the face to face group and 11 men and nine women in the Facebook group (Chi-square = 1.76; n.s.). There was also no significant difference in age (Chi-Square = 0.40; n.s.): the ages of the participants in the Facebook group (11 were between 25 and 30 and nine were between 30 and 35) and those in the face to face group were 15 between 25 and 30 and 5 between 30 and 35 (Table 2).

The results are described according to the four research questions.

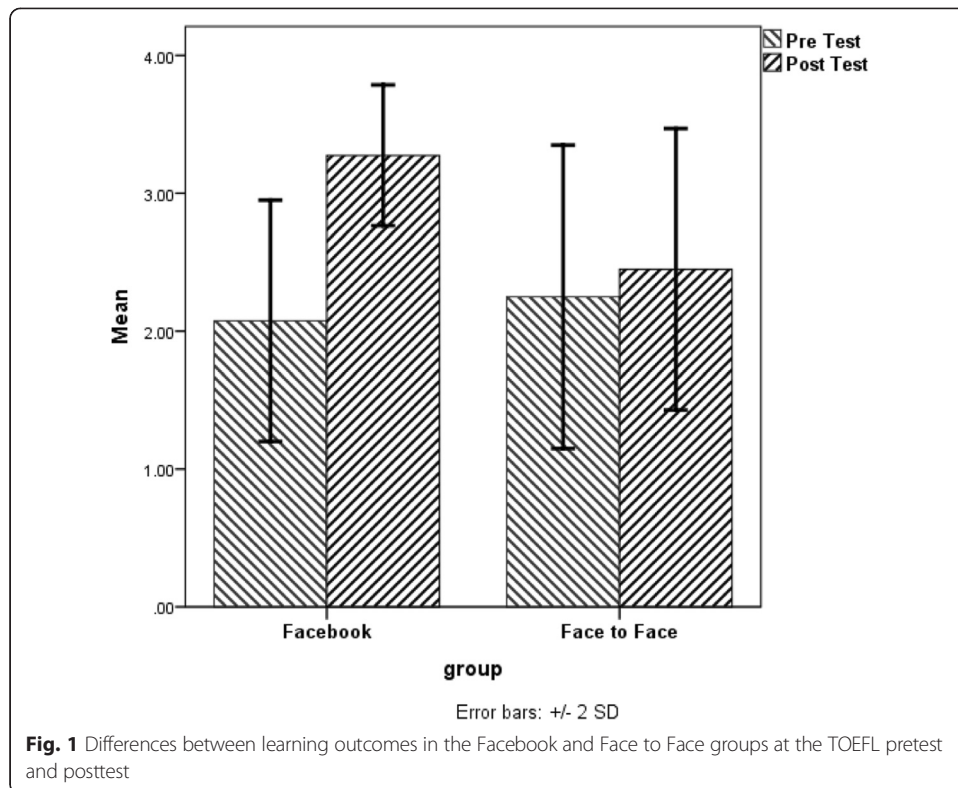
Differences in learning outcomes

To answer the *first subresearch question* a repeated measures analysis was used (see Table 3 and Figs. 1 and 2). The analysis focused on (a) the effect of Time (TOEFL pre-test versus post-test) on students' learning outcomes, (b) the effect of experimental Group (Facebook versus face-to-face) on students' learning outcomes, and (c) the Group \times Time interaction effect on students' learning outcomes.

Table 3 indicates a significant main effect of experimental group on linguistic outcomes, $F(1, 38) = 6.91$, $p = .01$. This indicates that on average Facebook students scored higher on linguistic outcomes than did face-to-face students. Second, the significant Group \times Time interaction effect (see Table 3), indicates that students' linguistic

Table 3 Analysis of Variance for Effects of Experimental Group and Time Variables on learning Outcomes (TOEFL pre-test vs. TOEFL post-test)

	SS	Df	MS	F	p
<i>Between subjects:</i>					
Group	2.11	1	2.11	6.91	.01
Error	11.63	38	.31		
<i>Within subjects:</i>					
Time	9.80	1	9.80	83.69	.00
Time \times group	5.00	1	5.00	42.70	.00
Error	4.45	38	.12		



outcomes developed differently from the TOEFL pre-test to post-test in the Facebook group compared to the face-to-face group, $F(1, 38) = 5.00, p = .00$. The scores on the TOEFL post-test were significantly higher for the Facebook group ($M = 3.28$ (SD 0.30)) than for the face to face group ($M = 2.45$ (SD 0.51)); as also can be seen in Fig. 1, in the Facebook group students' linguistic outcomes improved significantly more compared to linguistic outcomes of the students in the face-to-face group. Finally

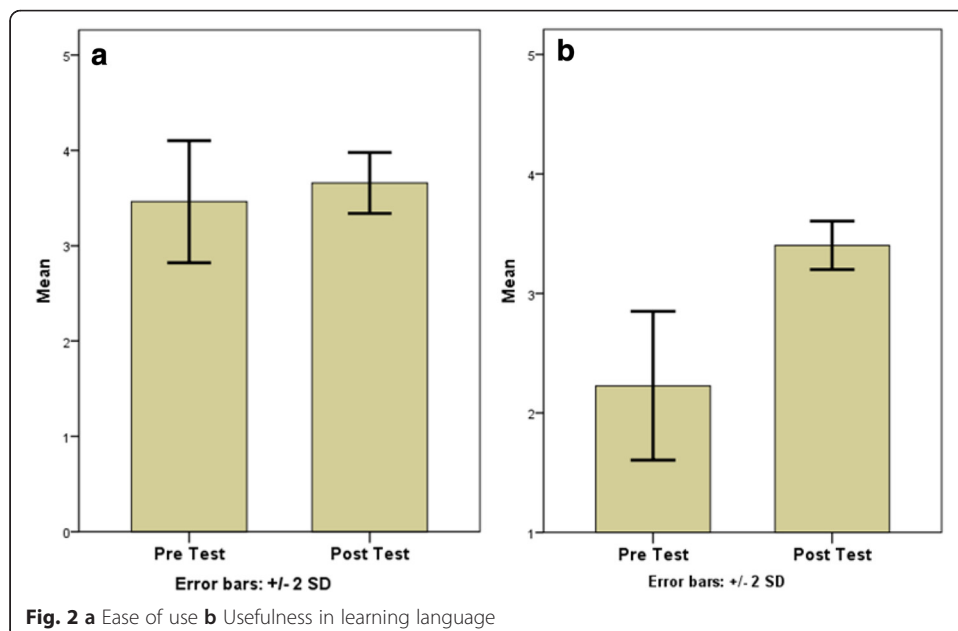


Table 2 shows a significant main effect of time on linguistic outcomes, ($F(1, 38) = 83.69, p = .00$). The data indicate that both the Facebook group students and the face-to-face students improved their linguistic proficiency from the TOEFL pre- to post-test (see Table 4 and Fig. 1).

Moreover, the difference between the two groups in terms of their opinions towards their degree of learning and improvements in their linguistic skills was investigated by an interview at the end of the course. The groups showed a significant difference in these two questions answers. Chi-Square tests were 25.55 and 29.33 for the two variables in the interview data (attitudes towards the degree of learning and improvements in their linguistic skills, respectively). All participants in the experimental group assessed their learning degree to be “much” and “very much”, while in the control group, 25 % of the participants assessed their learning degree as “much” and the remaining 75 % estimated it to be “a little bit” (Table 5). Concerning students’ improvement in their linguistic skills, 80 % of the participants in the experimental group stated that they perceived significant improvement in both speaking and writing skills while 20 % indicated that they only noticed an improvement in their speaking competence. However, the distribution of the improved skills is rather different in the face to face group. None of the students indicated an improvement in speaking and writing. Sixty percent of the participants selected only reading as their improved skill and 40 % selected only speaking (Table 5).

Differences in the processes of (language) learning

The *second subresearch question* concerns the variables related to students’ learning processes. These variables include engagement and motivation. Independent samples *t* tests were carried out. Table 6 presents these results, as well as the descriptive statistics of these variables in the two groups.

The results displayed in Table 6 show that students in the Facebook group report significantly higher levels of engagement, compared to students in the face-to-face group, $t(20.4) = 4.92, p = .00, d = 1.57$ (equal variances not assumed). Furthermore, students in the Facebook group also report higher levels of intrinsic motivation compared to students in the face-to-face group $t(28.2) = 10.81, p = .00, d = 3.41$ (equal variances not assumed).

The kind of activities and processes that influence the observed outcomes

The purpose of this section related to our *third research question*, is to determine the variables that are influential in the prediction of posttest linguistic outcomes among the variables of motivation and engagement.

Table 4 Mean and (SD) of learning outcomes on the TOEFL tests

Testing time	Learning outcomes	
Time1 (pretest)	Facebook	Face-to-face
Mean	2.08	2.25
SD	(0.44)	(0.55)
Time2 (posttest)		
Mean	3.28	2.45
SD	(0.30)	(0.51)

Table 5 Contingency Table of “Which skills have you improved” and “Do you think that you did improve your language?” per group

		Which skills have you improved			Total
		Reading	Speaking	Speaking and writing	
Group	Facebook	.0 %	20.0 %	80.0 %	100.0 %
	Face to Face	60.0 %	40.0 %	0 %	100.0 %
Total		12	12	16	40

		Do you think that you did improve your language?			Total
		A little bit	Much	Very much	
Group	Facebook	.0 %	65.0 %	35.0 %	100.0 %
	Face to Face	75.0 %	25.0 %	0 %	100.0 %
Total		15	18	7	40

Table 7 shows the correlation coefficients between Engagement, Motivation and the TOEFL pre-test and the TOEFL post-test for the two groups of Facebook and face to face. An interesting finding is the significant and positive relationship between posttest and engagement in the Facebook group. Nevertheless, in the face to face group, no significant relationship can be found between the Engagement and the TOEFL tests. However, in this face to face group, there are positive and significant relationships between the TOEFL pretest and motivation and between motivation and posttest.

Experimental groups’ views

In order to investigate the difference in the views of the Facebook participants’ between pretest and posttest, a paired samples *t* test was conducted. As Table 8 and Fig. 2 show, the averages of the two subscales were significantly larger than those before the course.

Conclusion

The research question in this study was: *Are there any differences in language learning between a Facebook group and a face to face group? If there are, what are the differences in language learning of between a Facebook group and a face to face group?*

The results indicate that there is a significant difference between the two groups in terms of degree of learning, motivation and engagement in the learning process. The group using Facebook during the English lessons developed higher degrees of learning, engagement and motivation than the face to face group. This is an important contribution to the literature: Many previous authors claimed that a Facebook setting would increase engagement and motivation of certain categories of students. Our study is one of the first to show that this is not only a theoretical claim, but that it shows up in

Table 6 Group Differences for Engagement and Motivation between Students’ in the Facebook Condition and the Face-to-face Condition

	Facebook group		Face to face group		T	Df	P	d
	M	SD	M	SD				
Engagement	74.95	33.08	37.90	6.31	4.92	20.4	0.00	1.56
Intrinsic Motivation	3.85	0.23	2.63	0.45	10.81	28.2	0.00	3.41

Table 7 The Correlations between engagement and motivation with learning outcomes for the two groups

Group		TOEFL Pre-test	TOEFL Post-test	Engagement	Motivation
Facebook	Engagement	-0.62*	0.74*	-	0.27
	Motivation	-0.24	0.28	0.27	-
Face to Face	Engagement	0.14	0.18	-	0.41
	Motivation	0.57*	0.57*	0.41	-

*Significant Correlation Coefficients ($\alpha = 0.05$)

empirical data too. Similarly, several authors claimed that better learning results could be expected in a social media environment without showing it empirically. Our contribution to the literature is that we were able to deliver the empirical data for these claims. Furthermore, the positive change in attitude towards social media is an important contribution to the field: experience with Facebook as a learning environment made students more strong in their engagement.

The results of our field experiment were clear. Are there any alternative explanations of these strong results? One possible alternative might be that the teachers were different in eliciting motivation and engagement with the students. This, however, was not visible in the observations that were made. Another alternative explanation could be that the differences between the groups were related to the extra opportunities the students in the Facebook group had to learn extra, for instance through extra peer learning, through the use of video's or via extra time investment. Indeed this can have happened, but in our view this is what should be expected. If Facebook had stimulated the students to study extra, this is an important side effect. Further research is needed to check this possibility. Although some extra activities were witnessed outside of the hours scheduled, this is, however, not likely to be the only reason why students in the Facebook group learned so much more.

Therefore, regarding the qualitative and quantitative increase in students' engagement in the Facebook group, it can be claimed that the results support the fourth principle of Astin's theory (students' learning development is based on the quality and the quantity of their engagement) and the fifth principle of this theory (The Effectiveness of any Educational Practice Is Directly Related to the Ability of that Practice to Increase Student Engagement) and indicate that the use of online social networks can increase educational effectiveness.

Our results are in line with other studies that discussed the potential of Web 2.0 tools for teaching, as was done in the Facebook group. For example, research by Malhiwsky (2010) also showed that the degree of learning is higher in a group using Web 2.0 (without specifying what kind of tool improved what skill) at both intermediate and

Table 8 Comparison of Subscales ease of use and usefulness (Before and after the course in the Facebook group)

	Pre Test		Post Test		<i>T</i>	<i>Df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Ease of use	3.48	.32	3.66	.16	2.20	19	.04
Usefulness in learning language	2.22	.31	3.40	.10	15.89	19	.00

advanced levels, compared to a group using face to face classrooms. Similarly, other authors (Junco et al. 2011) found that students' learning increased when Twitter was used during the learning process. Furthermore, it was found (Wang et al. 2011) that Facebook had a considerable influence on students' learning due to its interactive environment, which increased students' active participation during the learning process. Junco et al. (2011) report that the use of Twitter did increase students' scores. An explanation for the finding that Facebook increases students' engagement and learning outcomes in language learning comes from another study, focusing on narrative essays (Kabilan et al. 2010). Thereby the attitudes of undergraduate English language students towards the usefulness of the specific environment and features of Facebook for English language learning were investigated. The authors argued that students' use of Facebook enables them to learn more efficiently and to improve their linguistic skills, because they think that these networks make it possible for students to have different kinds of interactions and exchange knowledge during collaboration in order to increase their learning results.

Main implications

But is improving linguistic skills via authentic interaction and easy information exchange all that these online social networks can offer educators? Or are there more possibilities in other areas as well? It was expected that using online social networks can enhance knowledge and learning in other subjects as well, because of the many opportunities they provide for intercultural and inter linguistic communication. Probably, the effects on engagement and motivation will not only occur in language learning, but also in other domains. Further research is needed. Similarly to the other researchers mentioned above, it has been possible to demonstrate that online social networks are useful educational tools for learning languages. It is impossible to discuss the effects on learning without having more concrete data from actual working and learning in the environment of these networks. Most other studies only investigated attitudes or experiences of teachers and students. Roblyer et al. (2010), for example, investigated the difference in the attitudes of students and university faculty towards using Facebook in higher education. They state that communication is the nature of online social networks and communication and interaction provide an effective learning environment among students. Although all these statements support our research findings, our research is different in that our research results are based on empirical work while these other statements are mostly theoretical.

Different linguistic skills

The part of our results concerning the degree of learning is related to students' overall improvement of different linguistic skills during the course. Based on the statements of the participants in the experimental group in the questionnaire (Table 5), considerable improvement was mentioned in both speaking and writing skills while in the control group, only speaking or only reading was said to be improved. However, different kinds of online social networks or Web 2.0 tools (tasks, features and activities) may focus on different linguistic skills; in other words, based on different online social networks' facilities and features, specific linguistic

skills could be targeted, worked on and thus improved by students using them. Malhiwsky's research (Malhiwsky 2010) is rather similar to the current study in terms of research methodology and subject. It indicates that using Web 2.0 improves speaking, reading, writing and listening skills. However, that study does not mention exactly what kind of Web2.0 improved which skill. Abdous et al. (2009) investigated the social network Livemocha which is specifically used for foreign language teaching. Yet this study does not mention the kind of improved skill either. However, some research (Clark & Gruba 2010; Alm 2006; Anderson 2007; O'Bryan & Hegelheimer 2007) support the argument that Web 2.0 mostly improves speaking skills whereas other research (Dooly 2007; Ramaswami 2008; Soares 2008; Thorne & Reinhardt 2008) indicate that Web 2.0 mainly targets and improves students' writing skill. The works of these researchers, therefore support our results in that using online social networks for language learning, based on their different features and facilities, mainly improve students' writing and/or speaking skills, without focusing much on reading or listening. More research is needed to investigate the way in which online social networks should be used purposefully in (foreign language) teaching and learning.

Engagement

The *second subresearch question* was: are there differences between a Facebook group and a face to face group in the process of (language) learning in terms of students' intrinsic motivation and their engagement, and if so, what are these differences? Concerning the difference between the two groups' learning processes in terms of motivation and engagement, the research results indicate that both motivation and engagement were at the end of the course higher in the experimental group than in the control group. It seems probable that the higher degree of motivation and engagement in the Facebook group, as compared to the face to face group, is related to the difference in the teaching environment. As stated above, the social network of Facebook is free of time and space and it is also designed in a way that is more attractive to the students. It seems that the students enjoyed interacting in this way with their peers and teachers. Because student engagement represents the time and effort that students invest in collaborative and educational activities (Kuh 2001), it is often related to the achievement of positive student learning outcomes. In the face to face environment frequently there is not enough time for establishing interaction. Some students may find it difficult to interact or participate in these environments. This observation was also reported by previous researchers (Chen et al. 2010; Hu & Kuh 2001; Nelson Laird & Kuh 2005). However, it should be noted that the available research mainly deals with either engagement or motivation, instead of considering the two elements together in one study; when both variables were discussed, previous research consisted of theoretical discourses rather than experimental studies. Furthermore, most discussions concerned either Web 2.0 or integration technology in general terms, while the current study specifically investigated the influence of the social network Facebook in (raising) students' motivation and engagement in language learning. Malhiwsky (2010), for example, explicitly refers to the influence of Web2.0 on the promotion of motivation and engagement, quoting Little (2003) who stated that the promotion of these two

variables (motivation and engagement) is the result of an increase in social relations and cultural environments. However, that study focused on the investigation of achievement and classroom community and not on online learning.

Redecker et al. (2010) argue that Web 2.0 has a considerable influence on the improvement of motivation and engagement. Junco et al. (2011) investigated the use of the social network Twitter in teaching based on the theory of Astin (student engagement), but merely indicated that the engagement is higher in the experimental group (which uses Twitter) than in the control group. Others (Chen et al. 2010; Nelson Laird & Kuh 2005) did report that there is a positive relation between integration information technology and students' engagement.

Another author (Sandhouse 2012) argues that Facebook, as an educational tool, can increase students' involvement; Junco (2012) suggests that Higher education administrators use Facebook as an opportunity for increasing students' engagement. Roblyer et al. (2010) argue that through using online social networks such as Facebook, teachers can increase the overall quality of interaction which in turn promotes the interaction and engagement among students.

It is interesting that Cole (2009) indicates that using Wiki technology has little influence on students' engagement. This controversial observation may be explained by the fact that there are many differences between online social networks such as Facebook, Twitter etc. and Wiki technologies in terms of facilities and features. Therefore, it can be stated that the generalization of different kinds of online social networks, Web 2.0 or every kind of new information technology should be studied more. In general, it can be claimed that all of the mentioned studies support the fourth principle of Austin's theory (students' learning development is based on the quality and the quantity of their engagement) (Astin 1993).

In summary, most of current research support our result, that using social media as an educational tool can lead to increased student engagement (Annetta et al. 2009; Chen et al. 2010; Junco 2012; Patera et al. 2008).

Motivation

We relate our results on motivation to research concerning motivation in online social networks. Redecker and co-authors (Redecker et al. 2010) claim that using online social networks increases students' motivation. Blattner and Fiori (2009) also argued that Facebook can increase students' motivation for learning the English language. Others (Mills 2009; Mazer et al. 2007) observed that students who used Facebook for educational purposes, were more motivated for learning. Finally, Clark and Gruba (2010) argue that all different facilities of online social networks such as a) allowing learners to record their speech, b) writing a task for others, c) participating in live chats (which gives learners the necessary time to process input and produce appropriate output), and d) making video or voice calls for direct authentic communication with other learners or users, all play an important role in increasing students' motivation for learning new knowledge. This new knowledge is presented and practiced in spontaneous, interactive and sometimes unpredictable manners and environments. Based on our participants' statements in the research presented here (expressed in the questionnaires and

interviews), the following features should also be added to the above list: e) the additional time (compared to regular classroom based activities) and opportunities, that are available for different kinds of active learning, such as asking questions, doing homework, giving or receiving simultaneous or consecutive feedback, discussion with classmates, f) more frequent access to teacher, and g) the possibility of consulting other students' work, and finally h) access to a very large number of useful resources such as pictures, videos, web pages and documents available for language learning. Students believe that these features increased their motivation for more active voluntary participation during the course, which according to their opinion leads to increased authentic, constructive and productive interaction on subjects that are of interest and use to them.

Influence of variables on learning results

The *third sub research question* of our study concerned the variables that had the most influence on the degree of learning or students' ultimate (by the end of the instructional period) linguistic outcome (as measured in the posttest). It was investigated which variable or variables are stronger predictors of the degree of learning. Our results indicated that the two variables motivation and engagement had high correlations with linguistic outcome (posttest). These findings were expected given the Social Learning Theory (Bandura & Walters 1963) in which motivation is a key element in the learning process. In addition, Gardner and Lambert (1972) asserted that a learner's motivation is highly important especially in the process of language acquisition. Also the Theory of Student Engagement by Astin, which states that the more the engagement, the more the learning (Astin 1993, 1984), is confirmed by our results. Furthermore, studies have shown that students' personal involvement in the learning process increases learning (Benek-Rivera & Matthews 2004; Sarason & Banbury 2004) since, when learners become active participants of their own learning, they seem to adopt a more responsible attitude towards it, whereas, as passive receivers of knowledge, students' do not necessarily learn (Bertin et al. 2010) but receive, memorize and reproduce instructors' knowledge without being able to apply that to linguistic situations and contexts other than the one in which they were initially taught. Therefore, with regard to the importance of the two variables of engagement and motivation in the learning process, we, along with other researchers mentioned above, expected and predicted their rather significant influence on students' linguistic outcomes. Unexpectedly, the Engagement variable was especially influential in the Facebook group and the Motivation variable in the face to face group.

Changes in students' attitudes towards using online social networks

The results of the *fourth sub research question*, which only concerned the Facebook group, indicate that there is a significant positive change in students' attitudes towards using online social networks for learning languages. The participants in the experimental group expressed a positive attitude towards to the use of these networks for educational purposes; these positive attitudes were grouped in two subscales: 1) The ease of using online social networks; and 2) The usefulness of using online social networks for foreign language learning. Students' (positive or

negative) attitudes towards using information technology in general and online social networks in particular for learning, may be an important element in understanding their motivation. Lee et al. (2003) argue that understanding the usefulness of information technology directly influences students' attitudes and their motivation: a positive attitude toward a specific kind or feature of information technology results in an increase in using that information technology, while a negative attitude towards technology will lead to less frequent and less constructive interaction with information technology. Given these findings, the difference in participants' attitudes towards the use of these networks for learning languages both before and after the course were investigated. The answers reveal positive attitudes towards using online social networks in language learning. These students believe that not only do online social networks play a positive role in knowledge exchange but also that they can be used as educational tools. This observation is compatible with other research (Silius et al. 2010; Ajjan & Hartshorne 2008; Edirisingha et al. 2007; Kikuchi & Otsuka 2008) that also report that students have positive attitudes towards a combination of information technology and education. Our research showed that students became even more positive towards the use of online networks after following an online Facebook course.

Limitations and implications for further research

Yet, the main limitations of our research were that it was carried out on a small scale and used a limited population. Therefore, it did not allow us to make strong generalizations about the use of online social networks for language learning. Given the observations made in this paper, our current study opens the way for further research, especially on optimal and appropriate uses of social networks in foreign language teaching and learning. Further research needs to be carried out with larger numbers of subjects in order to verify these elements (linguistic improvement, motivation and engagement), as well as the practical dimensions of using online social networks for language learning, on a more representative population of English language learners, besides our current sample of Iranian PhD students.

The current research deals with the English language; Further research should be carried out on other languages and in other countries and cultures, in which students may have different perceptions, and attitudes towards using online social networks for educational (linguistic) purposes.

Moreover, our research indicated that students' language improvement consisted mainly of speaking and writing. Therefore, more research may be conducted by language-teaching experts on investigating:

1. The way in which other linguistic skills (listening and reading) may be improved by the use of online social networks for language learning;
2. Whether or not using online social networks improves all or some linguistic skills, and why some linguistic skills are more improved than others;

It would also be interesting and useful to try to understand by which activities and features all four linguistic skills can be improved.

Competing interests

The author(s) declare that they have no competing interests.

Authors' contributions

EA participated in the design of the study, contributed to the statistical analysis and drafted the manuscript. AN contributed to the statistical analysis of the data. RS conceived the study, and participated in its design and coordination and helped to draft the manuscript. AP contributed to the analysis of the results and helped to draft the manuscript. All authors read and approved the final manuscript.

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