The Use of Social Networking Sites in Education: A Case Study of Facebook

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Abstract: The purpose of this research is to find out how Facebook and Web 2.0 tools create a positive effect when used in education and to investigate teachers' opinions about the Online learning environment. This experimental study was carried out in primary and secondary schools with teachers who use Facebook. The study took six weeks and 30 hours. The teachers attended lessons and accessed materials online and offline, in face-to-face learning environment. Moreover, they were able to co-operate and share information with their colleagues via Facebook. The study sample consisted of 35 teachers from primary and secondary school who constituted a blended learning group and 36 teachers from primary and high school who formed an online learning group that enrolled in the material development for Facebook course. These teachers were chosen randomly. The participation was anonymous and the study was carried out amongst volunteered teachers. Data was collected using a 5-point Likert scale questionnaire created by the authors and entitled "Teachers' Opinions about Facebook in Education". The questionnaire consisted of 39 positive statements about Facebook. It was completed by teachers at the beginning (pre-experience test) and the end of the study (post-experience test). Results show that, if used for educational purposes, Facebook could bring about a positive change in teachers' opinions. Results also indicate that Facebook virtual environment helps teachers to do many activities with online classes, which is not possible to do in schools. Teachers are convinced that this environment helps students not only to improve their team work, but also to improve their learning skills. Based on the findings, recommendations are made about using Facebook in education.

Keywords: Facebook, Web 2.0 tools, virtual learning environment, social networking

Categories: L.6.0, L.1.4, L.6.1, L.3.0

1 Introduction

Educational Web 2.0 tools and mobile learning still remain popular today, which is the best sign showing how education has developed with the use of technology. Science and technology are constantly advancing. Online education and technology integrated education are now indispensable. Communication in education is much easier now due to the use of technology. With the use of Internet technology, activities that cannot be done in classrooms could easily be done on social networking websites with the help of smart phones. For example, photos, videos and many more materials can be shared without any limitation in time or place [Bicen & Cavus, 2010;

Uzunboylu, Bicen, & Cavus, 2011; Ozdamli, 2011; Schaal, Grübmeyer, & Matt, 2012; Jung & Kazienko, 2012]. With the growing use of social networking websites, the need for communication and information sharing between people is increasing. Thus, social networks are providing an informal education.

Development in science and communication technologies has increased even more in the 21st century. This caused the demand for digital products and tools to increase as well. This in turn has had an effect on the educational system. With Web 2.0, different applications have been developed to improve students' awareness, attitudes and skills [Martin, 2006]. Amongst these applications are blogs, wikies, social networking websites, and video sharing websites which started to emerge [Johnson, Levine, & Smith, 2009].

The first known social networking website is SixDegrees. This site was first issued in 1997. Thus, a new means of online communication appeared [Boyd & Ellison, 2007]. This site was the first to allow its users to create profile pages and send messages. Blackplanet, Migente and Cyworld sites which came out after 2001 have managed to bring virtual relationships to a different dimension. In 2004, after the rise of Web 2.0, Internet users met Myspace, Facebook and Bebo [Ebergi, 2007]. If social networking websites were to be categorised, LinkedIn would be the site for carrier management, LiveJournal for diary keeping, Flickr for photo sharing, and Facebook, Twitter or MySpace for communication with family and friends. While social networking websites allow users to create open profiles, they also allow them to contact other users on the web [Boyd & Ellison, 2007; Cabada, Estrada, Sanchez, Sandoval, Velazquez, & Barrientos, 2009]. When Facebook was created in 2004, it was first used in Harvard only, and then started to attract people all over the world [Sheldon, 2008; Urista, Dong & Day, 2009]. Facebook reached more than 12 million users in 2006. This number has risen to 850 million [Facebook, 2012]. According to Maloney [2007], social networking websites support the unity of people by emphasizing their shared interests.

Jones et al. [2010] stated that social networking websites are tools that can be used by teachers and students to facilitate education. Bran, Grosseck and Tiru [2011] conducted a research which showed that students spend most of their time on Facebook communicating with their family and friends, sharing photos and videos, and commenting on posts, but not sharing anything educational. Once a user joins Facebook, profile information of others can be seen depending on the settings they have chosen. Friendships can be made by sending friendship request or a message to the person one wants to add [Kolek & Saunders, 2008]. If that person accepts the friend request, both can be seen on each others' friend lists [Kolek & Saunders, 2008]. Users can also subscribe to the pages they are interested in. These pages are usually dedicated to celebrations, organisations, football teams, celebrities, etc. People who join these groups can easily find other people with shared interests and contact them to organize events. There are several ways of communicating via Facebook. For example, users can send each other private messages. Sending private messages is just like sending e-mails [Pempek, Yermolayeva, & Calvert, 2009]. These messages can only be seen by the user they are sent to [Golder, Wilkinson, & HubermanGolder, 2007].

Other studies show positive results related to the psychological status relations of the students with communication and social skills [Ellison, Steinfield, & Lampe, 2007]. Valenzuela, Park and Kee's [2009] research shows that using Facebook raises life satisfaction and social confidence. Ellison, Steinfield & Lampe's [2007] study confirms that users make friendships with people they don't know only to communicate with more people and expand their entourage. As Tufekci's [2008] findings show, students usually use social networking websites to share things, send emails and read blogs. Nowadays, Facebook and the use of Web 2.0 tools need to be explored for educational purposes.

1.1. Related Research

With the invention of Web 2.0, several social networking websites have been set up. One of the most popular social networking websites is Facebook. Facebook is a website that aims at allowing people to communicate with their friends and share information with each other. On the 4th of February 2004, Facebook was created by Harvard university student Mark Zuckerberg and was first opened to the use of Harvard University students. It started to gain active participation all over the world since 2006 [Sheldon, 2008; Urista, Dong, & Day, 2009]. On Facebook social networking website, photos can be shared as well as personal user information. By joining groups on Facebook, users can increase their popularity [Buckman, 2005]. Even though there are many social networking websites such as Twitter, MySpace and Friendster, Facebook is more often used for educational reasons by students in higher education. [Educause, 2006; Golder, Wilkinson, & Huberman, 2007; Stutzman, 2006; Arsan, Kutluca, & Ozpinar, 2011; Mokobane, 2011]. For example, in the United States of America, 90% of Facebook users are degree students. [Ellison, Steinfield, & Lampe, 2007; Stutzman, 2006]. With that, Facebook is gaining popularity among the English speaking students every day [Madge, Meek, Wellens, & Hooley, 2009]. It is enough to have an email address to join Facebook [Cain, 2008].

According to Lampe, Ellison and Steinfield [2007], Facebook forms fall into four categories: control forms, sharing forms, preference forms, and communication forms. Control forms allow the users to choose their sex and institutional locations. Sharing forms allow users to indicate their location and educational information and enable them to communicate with others. Preference forms enable users to define personal interests and identifications on profile pages. Preference form consists of the following elements: about me, interests, favourite music, favourite films, favourite TV shows, favourite books, and political views. Communication form consists of offline post address, email address, instant messaging name, relationship status, and birth date. Every user has the right to upload photos and change them whenever they want [Lewis, Kaufmanane, & Christakis, 2008]. Users can also use the Wall tool. Wall tool is shown on the profile page. It is similar to notifications. Using this tool, users can share short messages, photos and videos; their friends can also use this tool to share posts [Ross, Orr, Sisic, Arseneault, Simmering, & Orr, 2009; West, Lewis, & Currie, 2009]. Wall tool can also be used as a birthday calendar. Friends can maintain close relationships with the help of this tool. Users can also use the "poke" function to communicate with the person they want [Ross et al., 2009]. Golder et al. [2007] suggest "pokes" should be shown as notifications when users are connected to their account. Events tool helps to notify people about the event they are to join. Chat function allows users to communicate

with each other using instant messages. Instant messaging helps to maintain relationships between people [Nardi, Whittaker, & Bradner, 2000]. Apart from these, Timeline tool allows people to see friends' shared information and interests [Cheung, Chiu, & Lee, 2010; West, Lewis, & Currie, 2009].

Studies done on Facebook usually investigate the negative effects it can bring. For example, the inappropriate photos that students share. Other studies connect the time students spend on Facebook with the dropping performances in their lessons [Kirschner & Karpinski, 2010]. However, students and teachers haven't been investigated in these studies [Hursen & Ceker, 2012]. Facebook creates a powerful education environment for teachers and students due to the powerful network structure it presents and its added online educational tool. However, in order to use these tools in the best possible way, rearrangement of the environment must be done. Nowadays, people at any age are joining Facebook social networking website and sharing information with others.

Now that people are using Facebook more and more often, some problems can be seen in Facebook social networking website, such as its usability and utilization in web-based education. According to Maloney [2007], social networking websites strengthen the togethernesses of the individuals using their communal features. Jones and friends [2010] stated that social networking websites are tools to be used by teachers and stdents to enrich education. Bran, Grosseck, & Tiru [2011] found out that most of the students spend most of their time on Facebook, communicating with their family and friends in this time and also sharing photos, videos, commenting on posts but sharing nothing educational as a result of their studies. As a result of his study, which is done with student and teachers. Bicen, Ozdamli and Uzunboylu [2012] stated that social networking websites could promote communication between the teachers and students, provide an easy access to subject materials, and help see the announcements much easier. They also advised sharing learning materials by creating groups on social networking websites. Ajjan and Hartshone's [2008] study showed that, when used for educational purposes, social networking websites stimulate communication between students and the interest they show in lessons. The study also revealed that the use of these tools by teachers is really rare. Ellison, Steinfield and Lampe [2007] state that Facebook social networking website is a part of the daily routine and that 50% of the users are active during day. They have found that students use Facebook for 10 to 30 minutes once a day [Cassidy, 2006; Ellison, Steinfield, & Lampe, 2007].

According to Facebook's own data, average daily use of Facebook is 55 munutes [Facebook, 2012]. To encourage positive relationships between students, individuals with common interests or of the same age groups learning together increase their motivation [West et al., 2009; Kabilan et al., 2010]; socially contacting students creates an active use [Ellison et al., 2007]. Social networking websites are environments which can be created by the teaching staff [Madge et al., 2009]. Social networking websites create positive attitudes in teachers when a qualified learning environment is provided [Pasek & Hargittai, 2009; Kirschner & Karpinski, 2010]. This environment not only supports communication but also improves students' cognitive and social skills [Christofides et al., 2009; Ross et al., 2009], improves critical thinking skills [Lampe et al., 2008], and supports communication between individuals [Joinson, 2008]. If students can create their own learning ways, they can

access the applications and information, reach persons they are interested in and thus get comments from many people about the subjects they study. Teachers suggest students many applications where they can easily access the information they want, and they can approach all students at the same time [Hew, 2011], for the students can contact to other environments in different webs, they learn to understand different cultures and respect them. [Young & Quan-Haase, 2009; Ophus & Abbitt, 2009]. A student who has developed self-confidence [Bosch, 2009] can contact his/her teachers outside the classrooms [Selwyn, 2009].

2 Purpose of the Study

The purpose of this research is to find out the effects Facebook has on education if used for educational purposes and to investigate teachers' opinions about the formed learning environment.

In order to achieve these aims, the authors have sought to answer the following questions:

- What are the teachers' opinions regarding the use of Facebook in education?
- Did the teachers change their opinions about the usefulness of Facebook in education in end of the study?

3 Methods

3.1 Setting

This experimental study was carried out with primary and secondary education teachers using Facebook. The study took six weeks and 30 hours. The teachers attended lessons and accessed materials online and offline, face-to-face. Thanks to Facebook, they were able to co-operate and share information with their friends.

3.2 Participants

The study sample consisted of 35 teachers from primary school and high school with blended group and 36 teachers from primary school and high school with online group, who were enrolled in the Material Development for Facebook course. These teachers were chosen randomly from primary and secondary education establishments. The average age of the participants was 35, with blended group consisting of 82.9% (29 people) females and 17.1% (6 people) males. Online teacher group of was formed of 75.0% (27 people) females and 25.0% (9 people) males. The questionnaire was anonymous and was carried out among volunteered teachers.

3.3 Instruments

Data was collected from a questionnaire created by the authors entitled "Teachers' Opinions about the use of Facebook in Education": It consisted of 39 positive statements about Facebook that had to be assessed using five-point Likert scale where 5 points were assigned to "strongly agree", 4 to "agree", 3 to "neutral", 2 to "disagree", 1 to "strongly disagree". The questionnaire was completed by teachers at

the beginning (pre-experience test) and the end of the study (post-experience test). The validity of the questionnaire was reviewed by a panel of 25 educational technology experts and selected items were revised based on the experts' comments and recommendations. The administration of the revised questionnaire for 120 teachers yielded a Cronbach's alpha of .98.

3.4 Data Analysis

Each teacher completed a pre- and post-experience test in order to express their opinions about the usefulness of Facebook in education. Descriptive analysis was conducted, and a paired sample *t*-test was used in order to compare pre-experience and post-experience test means.

4 Application

4.1 Preparation of the Facebook Virtual Classroom Environment

While Facebook virtual class environment was being designed, groups and Facebook pages were created. Thanks to their Facebook pages, students who joined virtual learning environment showed improvement in academic performance. Facebook powerful Profile tools gave a chance for the teachers to make friends with each other. The teachers also shared a lot of information with their colleagues on profile pages. Thus, contribution to education has increased due to these sharings. Facebook Photo tools made lessons more interesting by giving the opportunity to create photo albums, share photos and make comments. Several learning materials have been added to the environment with the help of Facebook Wall tools. Thanks to this tool, news, videos, photos, notes, and questions suitable to lesson subjects were shared. With the help of Events tools, attendance of inside and outside classroom events could be planned and compared by the teachers. Using Chat tools, member teachers were able to chat with each other online. This way, they could get support concerning their lessons instantly. In addition to these, environment was enriched with Web 2.0 tools. PowePoint materials and documents were added to the environment through the adding and sharing function of the groups. Teachers also were able to share their own homework in the groups. This way the teachers could contribute to others by sharing the documents they created or the ones they found helpful. Online lessons were added and actualized by wiziq.com site's virtual classroom tools. Teachers made their presentations online thanks to this tool. Video materials were added to the environment by the use of youtube.com website's sharing features. Evaluation of student performnce was made and forwarded to the students by wiziq.com website's question asking tools. At the end of lessons, surveys were done by using Facebook's Questions tools and forwarded to the students. Getting back notifications improved lessons. In addition, , students contributed by making comments about each others' materials using Facebook's Like button and Comment tool.

4.2 Implementation

After the aims and targets of the study were established, a pre-test was applied to the teachers before starting lessons on Facebook Virtual Classroom to find out their

opinions about the learning environment. Teachers got access to Facebook's different tools such as photos, videos, questions, file sharing, events, status, and share tools in their six weeks 30 hours of training. During the course, teachers who have used the application were involved in sharing requests about the lessons every week in the environment and attain them to other applicants to get their comments, so that they could improve their own work. Teachers also adapted to Facebook application tools as they had to create their own pages and groups at the end of the course. In this environment, teachers had shared photos, videos, questions, files, events and statuses related to the homework they were given. While sharing these, they used the benefits of the WiZiQ sharing tools and Web 2.0 tools. All sharings, comments, and likes came as notifications. Therefore, each teacher had over 1000 notifications on his/her account. This way, they had an idea about what others did and improved their own posts.

5 Results and Discussion

[Tab. 1] presents the pre-experience and post-experience test means and standard deviations. The mean scores of the pre-experience and post-experience test were compared using a paired-samples t-test.

Statements			Blended Group Pre- experience test		Blended Group Post- experience test		Online Group Pre- experience test		Online Group Post- experience test	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	
1.	Facebook is an important tool in education	3.08	.95	4.42	.50	3.02	.90	4.25	.50	
2.	Facebook is a supportive tool to be used in lessons because of its addable materials.	3.48	1.01	4.62	.49	3.25	1.07	4.47	.50	
3.	 Having lessons on Facebook develops team work skills. 		.91	4.57	.65	3.11	.94	4.55	.50	
4.	Having lessons on Facebook helps one's personal development.	3.28	.95	4.45	.50	3.36	.96	4.27	.45	
5.	Facebook increases students' success if used in lessons.		.92	4.31	.67	3.05	.89	4.33	.53	
6.	Using Facebook helps to support my own branch.	3.17	.95	4.42	.55	3.19	.92	4.44	.50	
7.	Chat function enables sharing information with our colleagues.	3.25	1.01	4.57	.50	3.25	.93	4.69	.46	
8.	Students can see others' views about their homework and projects, and this increases their interest in lessons.	3.37	.97	4.42	.55	3.44	1.10	4.58	.55	
9.	Facebook makes learning more enjoyable.	3.51	1.06	4.57	.50	3.61	1.12	4.63	.48	
10.	My colleagues' profile pages help me to get to know them better.	3.40	.97	4.54	.50	3.44	1.08	4.30	.62	
11.	Students' profile pages help me to get to know them better.	3.22	.94	4.48	.65	3.25	.93	4.25	.73	
12.	Being in contact with students on Facebook increases their motivation.	3.25	.95	4.60	.49	3.27	.94	4.47	.50	
13.	Tagging my colleagues in helpful posts helps them to learn more.	3.40	1.06	4.51	.56	3.47	1.02	4.50	.50	
14.	Sharing extra resources related to students' homework increases their motivation.	3.40	.94	4.51	.50	3.30	.95	4.47	.50	
15.	Using Post tools to share news that I have read in the newspapers helps me to inform students	3.31	1.02	4.65	.48	3.22	.92	4.55	.50	

	about what is going on around the world								
16.	Using the notes tool on Facebook to share information helps people to learn more.	3.28	.92	4.48	.50	3.27	.94	4.47	.55
17.	Using Facebook's Notes tools to share scientific studies contributes to students' development.	3.25	.91	4.42	.60	3.30	.95	4.41	.55
18.	Using Facebook makes it convenient to access subject materials.		.93	4.57	.50	3.30	.95	4.50	.56
19.	students' interests in lessons.	3.31	.96	4.40	.60	3.25	.93	4.58	.50
	I take my colleague's views into consideration when I share educational posts.	3.17	.98	4.42	.55	3.27	.94	4.61	.49
	Video materials on Facebook create stability in education.	3.31	.93	4.60	.49	3.08	.87	4.61	.49
22.	 Getting notifications when subject materials are added on Facebook increses participation of students in lessons. 		.93	4.42	.69	3.27	.94	4.47	.55
23.	Seeing subject materials on Facebook helps us to become better.		1.02	4.45	.56	3.27	.94	4.55	.50
24.			.94	4.45	.61	3.33	.95	4.50	.50
25.	increases the students' interest in lessons.	3.25	.91	4.51	.50	3.27	.94	4.44	.55
26.	more interesting.	3.17	.89	4.71	.45	3.16	.91	4.69	.52
27.	Livestream.com Learning environment.	3.22	.94	4.74	.44	3.11	.88	4.75	.50
28.	Sharing written materials on Facebook via scribd.com Learning environment.	3.25	.95	4.77	.42	3.25	.93	4.75	.43
29.	Sharing PowerPoint materials on Facebook via slideshare.com Learning environment.	3.28	.95	4.80	.47	3.22	.92	4.80	.46
30.	Sharing subject-oriented materials that students have found on Facebook increases their interest in lessons.	3.45	.95	4.57	.55	3.30	.95	4.47	.55
31.	Using Survey tools on Facebook and receiving back notifications help to improve lessons.	3.40	.97	4.54	.65	3.16	.91	4.50	.56
32.	increases the attendance.	3.42	.94	4.54	.56	3.27	.94	4.52	.55
33.	relationships.	3.08	.95	4.17	1.0 4	3.22	.95	4.13	.89
34.	colleagues helps me to develop myself.	3.31	.93	4.57	.55	3.30	.95	4.69	.52
35.	Using event tool for outside-classroom events increases the attendance.	3.34	.96	4.48	.61	3.19	.92	4.58	.50
36.	Events tool improves students' social event organising skills.	3.42	.94	4.42	.65	3.16	.94	4.50	.56
37.	Events tool motivates students to share course- related project delivery dates.	3.40	.97	4.51	.50	3.36	.96	4.55	.50
38.	Following my friends' events on Facebook gets me up-to-date with daily news	3.40	.94	4.54	.50	3.25	.93	4.66	.53
39.	Events tool increase my communication with students.	3.31	.93	4.45	.65	3.27	.94	4.55	.60

Table 1: Pre-experience and post-experience test results regarding opinions about the usefulness of Facebook in education.

In [Tab. 1], after the course, teachers in both groups stated that Facebook was an important tool for education, a supportive learning environment for lessons where they could share educational materials. It develops the team-working skills; helps one's personal development; could increase the students' successes; could be helpful for both teachers and students when used as a supportive material in lessons; allows to share information between colleagues' could make students show more interest in

lesson; could make learning more enjoyable; helps teachers and students to know each other better via the profile pages; could increase students' motivation by allowing them to communicate with each other; encourages colleagues to learn more; could increase students' will to learn by sharing extra resources about their homework; helps students to find out what goes on in the world through daily news; enables them to share information about scientific studies.

As the findings show, after the material use on Facebook course, teachers of both groups have stated that Facebook made it easier to find lesson materials; adding materials made lessons more interesting to the students; colleagues showed interest in others' opinions when materials were shared; video materials on Facebook created stability in education; sending notifications to students when subject materials were added caused an increase in participation; sending subject materials helped each person to develop themselves; sharing materials about lesson would increase the interest students show at the lessons; using web 2.0 tools would make lessons more interesting; adding video materials with livestream.com, written materials with scribd.com, PowerPoint materials with slideshare.net would enrich the learning environment; students sharing educational subject materials on Facebook would also increase the interest in lessons; using the surveys tool to get notifications back from students helps to improve lessons; and sharing announcements on Facebook groups increases the participation in the lessons.

Using the findings, after the "planning educational events on Facebook" course, teachers in both groups stated that chatting on Facebook strengthens social relationships; organizing educational events with colleagues helps to develop themselves; organizing outside-classroom events using the Events tool increased students' interest in lessons; using the Events tool to organize events improved the social activity organising skills and thanks to this tool, sharing dates of the projects due in increased students' motivations and following the events their friends do, being uptodate with daily information and increases the communications between students. Many studies have results similar to these findings. Ziegler [2007] stated that Facebook changes individuals learning behaviour from passive to active, Mazman and Usluel [2010] stated that it has an education-oriented form, Munoz & Towner [2009] stated students motivations with by providing useful materials material richness. Yuen and Yuen [2008] stated that it would support communication and improve teamwork skills, Kabilan et al. [2010] stated that the improvement in social event planning would increase active attendance.

Facebook Use in Education									
Blended Group	N	Ñ	SS	Df	t	р	Explanation		
General Point	Pre-test	35	3.31	.85	34	22.9	00	P<0.05 Difference	
General Point	Post-test	35	4.52	.36		22.9	.00	P<0.03 Difference	
Online Group		N	Χ̄	SS	Df	t	р	Explanation	
General Point	Pre-test	36	3.26	.85	35 22.8	22.0	00	P<0.05 Difference	
General Point	Post-test	36	4.51	.35		22.0	.00	r<0.03 Difference	

The mean difference is significant, at 05.

Table 2: Pre-experience and post-experience test results with regards to teachers' opinions about the usefulness of Facebook in education.

As seen in [Tab. 2], there is a difference in opinions about Facebook use in education, use of materials and planning of educational events" before and after they participated in the course (t=22.98, p<0.05). Before the course, teachers stated "I am not sure" about the use of Facebook in education (\overline{X} =3.31, SS=0.85). This statement changed to "I totally agree" after the course (\overline{X} =4.52, SS=0.36). As for the general points of teachers' opinions in the online group, there is a difference in opinions about the Facebook use in education, use of materials and planning of educational events before and after they participated in the course (t=22.83, p<0.05). Before the course, teachers stated "neutral" about the use of Facebook in education (\overline{X} =3.26, SS=0.85). This statement changed to "I totally agree" after the course (\overline{X} =4.51, SS=0.35). It can thus be said that teachers enjoyed using Facebook in their work and conducting lessons in the Facebook Virtual Class.

6 Conclusion and Future Studies

The study results showed that the teachers' opinions of Facebook use for educational purposes became more positive. The results show that Facebook Virtual Class enables several activities to be done by teachers which are not possible to do in "real-life" classrooms. Teachers suggest that this learning environment does not only help to improve students' team working skills, but also helps them to achieve better results in learning. They expressed the view that the students' file and link sharings will increase their participation and motivation. Thanks to social networking websites, students can get to know each other better and take education to its highest level, and thus become more qualified with the help of different tools. The tools used in this study, such as Web 2.0 tools, livestream.com, slideshare.net, wiziq.com, and scrib.com tools increased the learning options in the Facebook environment and made it more interesting, therefore creating richer learning environments. Future research will deal with more communities, reach to various teacher and student groups, get redesigned and developed, enriched with different Web 2.0 tools (IOS, Android) and mobile technology applications. This article will provide guidance to other activities which will be held and used in the development of a variety of courses.

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