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A review on Facebook as a user-generated content environment in tertiary education

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Abstract: In tertiary education, new learning processes, technologies and tools are increasingly applied to encourage and underpin students' involvement. Lately, these include the use of Facebook where users are participators instead of observers. The main aim of this paper is to investigate Facebook's usage for content generation in tertiary education. For this purpose, we review 19 relevant published cases to investigate the tools used and activities realized, the instructors' role as well as benefits and problems encountered. The paper concludes that students use tools like the Wall and multimedia uploading to ask questions, discuss and share resources. The role of instructors remains essential but is conversed to a facilitator initiating discussions and providing course-specific material. Finally, there is evidence that students' participation increases and they learn better. However, Facebook does not provide appropriate tools for educational purposes while privacy remains a main obstacle to its wider adoption.

Keywords: Facebook; user-generated content; social networking websites; participative web

1. Introduction

Social networking websites such as MySpace, Facebook and Twitter have become increasingly popular since their emergence in the World Wide Web. Each social networking website is unique in its functionalities and purpose and usually intends to attract groups of people that share common interests. The most common definition of social networking websites is: “web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system.” [boyd and Ellison, (2007), p.211]. Facebook is an indicative example of this technology, and representative of “participative web”, where users actively interact with the environment's interface, collaborate with other users and create content.

This developed content, also known as “User Generated Content” (UGC), allows for the representation of differentiated views of the same topics by users of different backgrounds as well as the realization of social interactions that motivate users' engagement (Cha et al., 2007). UGC can be defined as “i) content made publicly available over the Internet, ii) which reflects a ‘certain amount of creative effort’, and iii) which is ‘created outside of professional routines and practices’.” [Vickery and Wunsch-Vincent, (2007), p.9].

The generation of content by users has been emerging in learning environments also, shifting the control towards students, while the instructors adopt the role of facilitators and enablers of knowledge construction (Harden and Crosby, 2000). In these cases, students

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stop passively absorbing information and become producers (Horizon, 2007) of valuable and relevant knowledge. This production is realized not only by searching existing information but also by organizing it into interlinked entities that along with new data form meaningful, relevant and new knowledge (Jonassen et al., 1999).

However, this change in the learning process faces a number of challenges. The most important challenge is the need to moderate and facilitate the knowledge development process by providing resources to existing information and tools that underpin the new knowledge construction. Social networking websites and more particularly Facebook is a technology that is rooted in the social constructivist theory, and therefore could support this transition and the successful generation of content by its users (Richardson, 2006).

The aim of this paper is to investigate Facebook’s usage for content generation in tertiary education. To this end, we identify and examine 19 representative cases where Facebook has been used in academic contexts and we carry out an analysis of each case. We aim to research:

1. Which tools and activities underpinned the content generation process?
2. How did the instructors facilitate or contribute in content generation?
3. What benefits and problems were encountered regarding the creation of content in Facebook?

The next section provides a theoretical background regarding UGC and social networking websites as well as the issues that are often encountered when students and instructors contribute content to a social networking website such as Facebook. Section 3 presents the methodology followed and an overview of the examined 19 case studies where Facebook was employed in tertiary education. Section 4 documents the answers to the aforementioned research questions after the analysis of the cases and discusses the results. Lastly, Section 5 draws conclusions and suggests future work based on the findings.

2. Theoretical background

The term UGC is considerably vague; hence there is a need for some indicative characteristics that could be used to identify what is considered a UGC (Vickery and Wunsch-Vincent, 2007). These characteristics that were identified in the UGC’s definition given in the Introduction are analyzed as follows:

- **Published content:** We consider as UGC all content that is published online rather than content created in hard copies such as notes or in desktop tools such as text editors etc. UGC needs to be accessible to a variety of people anytime and from anywhere. To this end, even published content such as e-mails personal messages and synchronous communication tools such as chats are also not considered UGC.

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- Creative effort: There are two types of UGC. The first type consists of content that is generated without adapting existing work, such as new videos or photographs, which express personal views of a subject that are uploaded online. The second type refers to the publication of already existing content whose added value is the additions and adaptations carried out by users. One could argue that any type of published content should be considered a UGC. However, this does not apply in cases where the content is transferred from one online environment to another without any changes or additions from a user, such as the recording of a movie or music clip and its online publication to a website. Hence, when the content is not generated from the beginning, it is required for users to put in creative effort while adapting existing, relevant to the context information.
- Creation outside of professional routines and practices: Even though this characteristic does not apply in every case, it is generally accepted that UGC is not developed for commercial purposes and its generators are not professionals that expect to gain profit from its exploitation. The intent of the UGC creation usually lies in users' desire for expression and/or to present their personal view of existing work.

The different types of content that is generated by users are textual information (e.g. text, files and links) photos, images, music, audio and videos (Krumm et al., 2008). Moreover, online environments that support the generation of UGC can be categorized as follows (Vickery and Wunsch-Vincent, 2007):

- Blogs: users create entries that are presented in reverse chronological order (Gill, 2004; OECD, 2006). Blogs allow a variety of UGC formats, such as text, images, audio and video.
- Wikis: users can add, edit or delete their own or others' content in a collaborative way. The UGC formats that are usually generated are text and images.
- Social bookmarking websites: users can add, edit, delete and mostly organize links to websites, articles, videos etc according to their topics of interests. Rating, commenting and tagging mechanisms also allow for content promotion and exchange between users. Social bookmarking websites support formats such as text in the form of links and in the form of tagging or comments.
- Podcasting: users can produce audio and/or video files and publish them in podcasting websites. The files are organized according to their genre and subscribers have access to the produced feeds. Podcasting websites support UGC formats such as audio and video.
- Social networking websites: users connect with each other by interacting socially and create content by blogging, talking to other users, posting personal information about them and sharing knowledge. Social networking websites allow all UGC formats to be publishable and accessible (e.g. text, photos, video, images, audio etc).

The online environments that belong to the last category have a continuously increasing number of users that participate in content generation on a daily basis, most of the time

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subconsciously and without a specific intent (Shirky, 2003). Representative examples, apart from the well known MySpace and Facebook, are Flickr, where users upload and share photos and YouTube, where users upload and share videos.

Therefore, in such environments the generation of content is already being produced, and users are previously familiar with the process. To this end, it is interesting to investigate how instructors could incorporate them in educational contexts so that content generation would have a specific purpose and an added value by underpinning the learning process (Wheeler, 2001). The application of social networking websites in education is in accordance with the recent increasing integration of online technologies in academic environments to support collaborative and distance learning as well as to ensure students' active engagement in the process (Jonassen, et al., 1999).

Indeed, according to Ebersbach et al. (2006), the interoperability of social networks and learning for the generation of content has proven productive. For example, Facebook's environment ensures students' engagement when constructing knowledge since they are already familiar with its features, interface and functionalities and they are positively inclined towards its usage because they have associated it with their entertainment (Jacobs, 2003).

More specifically, with Facebook, students are able to express themselves more easily, without having to burden their cognitive load by learning a new environment and can communicate with their fellow students with synchronous and asynchronous means. This constant interaction between students around the world that is promoted in social networking websites (Rheingold, 2003) underpins the collaborative realization of activities by students and therefore enables them to be productive (Horizon, 2007). Another increasingly known term to describe such a process is the produsage paradigm. Produsage is “the collaborative, iterative, and user-led production of content by participants in a hybrid user-producer, or produser role” [Bruns, (2006), p.275]. Web 2.0 technologies such as Wikipedia and social networking websites such as Facebook are representative examples of online users transforming into produsers. Produsers not only engage in online activities, but they collaboratively and continuously build new and extend existing content.

According to relevant literature, one of the main reasons Facebook group pages are successful is the iteratively enriched UGC (Bae, 2010). To this end, it can be argued that its incorporation in educational contexts leads to fruitful content generation. When students are motivated or positively inclined to generate content, they participate and contribute actively, as opposed to when they consider their participation as obligatory (Szwelnik, 2008).

This, however, raises a series of issues that need to be addressed. The most important issue is related to the content's relevance to the curriculum. This can be addressed with the moderation of the content uploaded from the instructors. Moreover, instructors are required to allow freedom of expression while at the same time maintain a respectable, free of conflicts environment. This can be ensured with the various tools provided by Facebook

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that enable students' involvement and collaboration so that any arguments that may occur can be solved quickly and effectively. Additionally, there is an issue regarding quality of content produced by students, where inappropriate additions need to be removed as soon as possible. This is usually regulated by Facebook's filtering technology; however, instructors should also monitor the contents posted (Vickery and Wunsch-Vincent, 2007).

3. Methodology

The methodology we employed is mainly exploratory and grounded on the thorough review of the primary data provided by literature that has studied the application of Facebook in tertiary education. We do not aim to test specific hypotheses but rather to map this new field. For this purpose, we base our work on examining multiple case studies identified from published literature and documenting information that focus on content generation rather than other aspects such as collaboration, social interactions etc. The literature was searched using a systematic, well known method in Information Systems research.

More specifically, the investigation of a variety of cases that apply Facebook in tertiary education and derive results from its usage required the implementation of a concept-centric literature review, as suggested by Webster and Watson (2002). This suggests identifying scientific articles that include concepts relevant to our study as keywords. Initially, we searched different combinations of keywords (e.g. Facebook, education, learning etc) on scientific articles' titles within online databases such as Web of Science, Scopus, Google Scholar and CiteSeer.

The search resulted in the identification of numerous relevant articles that were further reviewed. This led to a sequential investigation of their references, which resulted in a second round of literature review and the collection of additional articles. The articles gathered were examined based on the concept-centric approach, where concepts such as “Facebook tools”, “Facebook activities”, “methodology of use”, “benefits of use”, “university-level education” etc were used to map the articles' contents. Finally, 19 cases were selected as those that included all or the majority of concepts (Timonidou, 2011). Even though the number of cases identified and examined cannot provide a holistic overview of how users produce content while using Facebook in educational contexts, it can be considered as providing an indicative foretaste of the activities executed, tools used and used observed.

The 19 identified cases were analysed based on the specific criteria, which represent the aforementioned research questions, as follows:

- Which of the used tools generated content?
- Which of the realized activities generated content?
- How did the instructors facilitate or contribute in content generation?

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- What benefits were noticed from generating content on Facebook?
- What problems were identified regarding the content generation on Facebook?

This information is analysed and presented in detail in the forthcoming sections of the paper.

3.1. Overview of the cases

The 19 cases vary significantly in many factors, such as the users’ ages, the courses applied as well the learning context in which Facebook was implemented. More specifically, Facebook was mostly used by students either at the beginning or towards the end of their studies. In 7 of the 15 cases that provided information regarding the type of classes, it was stated that the classes were compulsory and the use of Facebook was optional and not graded. Table 1 provides a synopsis of the 19 cases’ most important details (Timonidou, 2011).

Table 1 List of cases included in the literature review

Identifier	Source	Course	Facebook usage	Students	Country
C1	(Al-Atabi and Younis, 2010)	Thermodynamics and Heat Transfer Module	Facebook group, closed	60	Selangor, Malaysia
C2	(Bae, 2010)	-	Facebook, invitation only	15-25	Chicago, USA
C3	(Bunus, 2010)	Design Patterns (Computer Science)	FB page (open, so everyone can join)	170-180	Sweden
C4	(de Villiers, 2010)	Concepts and Principles of e-Learning	FB group, closed	30	South Africa
C5	(English and Duncan-Howell, 2008)	Business education	FB group, closed	28	Australia
C6	(Estus, 2010)	Geriatric pharmacotherapy	Facebook group, closed	30	Rhode Island, USA
C7	(Fernández and Gil-Rodríguez, 2011)	2.0 Travel: on-line tools and resources	Two FB groups, (closed)	27	Spain

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C8	(Fouser, 2010)	Korean Language and Culture Education (teacher education)	FB group, private	11		South Korea
C9	(Kayri and Çakir, 2010)	Computer Networks and Communication	(2) FB groups, open	31 27	and	Turkey (2 Universities)
C10	(Loving and Ochoa, 2011)	BA Honors Research Methodology	FB group, private	17		Florida, USA
C11	(McCarthy, 2009)	Imaging Our World	FB group (IOW) open	100		Adelaide, Australia
C12	(Ractham and Firpo, 2011)	Introduction to MIS (Management Information Systems)	Facebook group “IS201” Group, closed	69		Bangkok, Thailand
C13	(Rambe and Ng’ambi, 2011)	Information Systems	Facebook group, closed	165		Cape Town, South Africa
C14	(van Rooyen and Pieterse, 2010)	Advanced data structures and algorithms using C++ and Program modelling and design	FB group started by students (informal) open	63		Pretoria, South Africa
C15	(Schroeder and Greenbowe, 2009)	Introductory organic chemistry laboratory	Facebook group “Chemistry 231L”, closed	52		Iowa, USA
C16	(Skiba, 2010; Sherrill and Breed, 2010)	Maricopa Nursing Laboratory	FB profile (open)	792		Phoenix, Arizona, USA
C17	(Szwelunik, 2008)	Business in Context	Facebook group	60% of students		Oxford, UK
C18	(Wang et al., 2011)	Teacher education	One FB group	31		Singapore
C19	(White, 2009)	English language course for students of the tourism industry	Facebook group, secret	9		Kyoto, Japan

The average size of a group formed to collaborate through Facebook is 30 students. In 14 of the 19 cases (C1, C3, C5, C6, C7, C10, C11, C12, C13, C14, C15, C16, C17, C18) over 90% of the students reported that they were already familiar with Facebook, while the same percentage in the majority of the remaining cases fluctuates from 75% to 80%. Facebook’s usage by students and instructors lasted for the entire duration of the course in 18 of the 19 cases. Only in C7 Facebook was used for 5 weeks during an academic semester.

4. Results

Facebook’s environment allows the creation of three main sub-environments where users can interact, namely a page, a profile and a group. More specifically, C3 created an open

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page for the class, C16 a Facebook open profile, whereas the rest of the 17 cases created Facebook groups. Out of these groups, 12 had restricted to members or granted by invitation access while the others were public.

4.1. Tools used on Facebook

Table 2 lists specific tools and applications that were used in the 19 examined case studies, and the frequency with which each one was met.

Table 2 Tools that were used on Facebook

Tool	Case identifiers	Sum
Wall	C1, C2, C3, C4, C5, C6, C7, C8, C10, C11, C12, C13, C14, C15, C16, C17, C18	17
Discussion Board	C1, C3, C4, C5, C6, C7, C8, C10, C12, C13, C14, C15, C18, 19	14
Photos	C3, C5, C6, C7, C8, C11, C12, C15, C16, C18	10
Links	C3, C4, C6, C7, C14, C15, C16, C17, C18	9
Videos	C3, C5, C12, C16, C17, C18	6
Private Message	C10, C12, C13, C17, C19	5
Quizzes	C1, C3, C12	3
Events	C6, C11, C18	3
External apps	C6, C10, C18	3
Discussion (on Wall or Board: unknown)	C2, C9	2
Live Chat	C10	1
Tagging	C12	1
Notes	C3	1
Other FB apps	C3	1

As noted in the theoretical background, not all tools mentioned above underpin content creation. More specifically, live chat and private messaging are tools that promote communication and the content that is produced (e.g. conversation) is not documented for acquisition by other users.

The Wall is the most frequently used tool, as expected, as it is the main interface users are met with when logging in the environment. The Discussion Board was very popular for holding separate discussions on a variety of topics. However, this tool is not supported by Facebook anymore, thus its usage is transferred on the Wall. Other UGC formats that were created consisted of uploading of photos and videos as well as the provision of links to subject-related material.

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Quizzes and Events were also used and can be considered UGC, since they follow the three characteristics of added content and can be accessed afterwards by the same or future students and instructors.

It should be noted that the tools provided by Facebook are limited in number and in nature in order for it to be considered an adequate educational tool. This has been depicted by relevant literature as well, where studies point out the need for external applications usage (Bunus, 2010; Fernàndez and Gil-Rodríguez, 2011; Loving and Ochoa, 2011) or construction (Wang et al., 2011; Bunus, 2010; McCarthy, 2009).

To this end, external applications were used in a few of the examined case studies. More specifically Blogger was used in C7, Googledocs or email in C18, and spreadsheets and other tools that are not a part of the Facebook tools repository in C10. Another study suggested a FAQ application, so that students would not repeat questions that had already been answered (Rambe and Ng’ambi, 2011). The tools that are supported by Facebook are divided in Figure 1 into three categories, based on the outcomes of the users’ interaction with them.

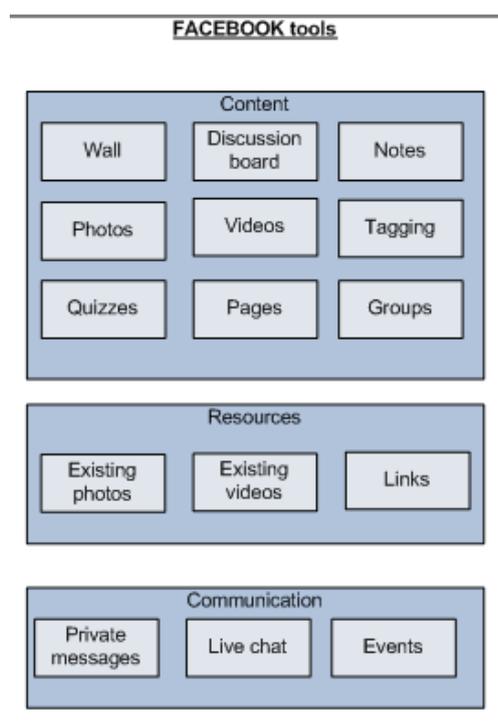


Figure 1 Categorization of Facebook tools

The theoretical background section presented the different UGC formats as indicated by the relevant literature. With focus on Facebook, we can assume that, for example, questions and answers as well as assignments could become a powerful and useful library and syllabus for future courses. This way, a constantly augmented by students course repository is developed with different viewpoints of the same or different resources, discussions, questions and assignments for future exploitation by students and instructors of the same or

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similar courses. Even the complains made via Facebook are a fruitful content addition to the course since they provide guidelines to the same or different instructors of the course regarding proper ways to design the lessons prior to their implementations according to the students’ feedback.

4.2. Activities executed on Facebook

Table 3 presents the specific activities that took place and refer to content generation on Facebook on the 19 case studies.

Table 3 Activities that took place on Facebook

Activity	Case identifiers	Sum
Students asked questions about the subject (e.g. theory which they hadn’t understood)	C1, C2, C7, C10, C12, C13, C14, C17	8
Continuation of in-class discussion and discussion of the material, students’ thoughts about it, etc.	C2, C4, C6, C8, C9, C15, C17, C19	8
Students asked for help/advice on assignments, solving problems, etc.	C3, C5, C10, C12, C13, C14, C15	7
Students shared information, resources, links, etc.	C4, C7, C9, C12, C13, C14, C18	7
Instructors provided links, material, etc.	C3, C10, C15, C16, C17, C18	6
Assignments were posted and commented on (or not) by other students	C6, C7, C11, C12, C17, C19	6
Making announcements about deadlines or asking for such information	C3, C10, C13, C16, C18	5
Students shared their experiences	C5, C7, C8, C12, C14	5
Students got feedback from others	C4, C6, C12, C15, C18	5
Students practiced on the material (quizzes, questions)	C1, C3, C12, C19	4
Students collaborated on assignments and shared solutions (after the deadline)	C12, C14	2
Submitting coursework	C10	1
Students complained about class	C14	1

All above activities generate significant content which was either produced from the beginning or edited by students and instructors. More specifically, students frequently asked questions on specific subjects that required clarifications, prompting either other students or the instructors to form a valid answer and post it on Facebook. Moreover, students were able to seek assistance by asking for advice on assignments. This facilitates their performance, as they were able to quickly retrieve feedback on their questions from users that are familiar with the specific assignments instead of making generic inquiries online.

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Apart from the helpful content creation, students that answer these questions were able to analyze the problem at hand, identify their classmate’s issues and come up with one of multiple answers that address them. This way, they developed significant transversal competences, such as teamwork, critical thinking, problem solving etc.

Additionally, students and instructors shared various resources that were relevant to the course. This way, different people augmented Facebook with subject-specific and multimodal materials. Apart from resources, students also shared their experiences and got corresponding feedback from the group members. This content is helpful as it allows students to express themselves regarding their likes and dislikes about the course and also to improve themselves by taking into consideration the helpful feedback retrieved.

Figure 2 shows a representative example of how online discussions are realized, organized and documented within Facebook.

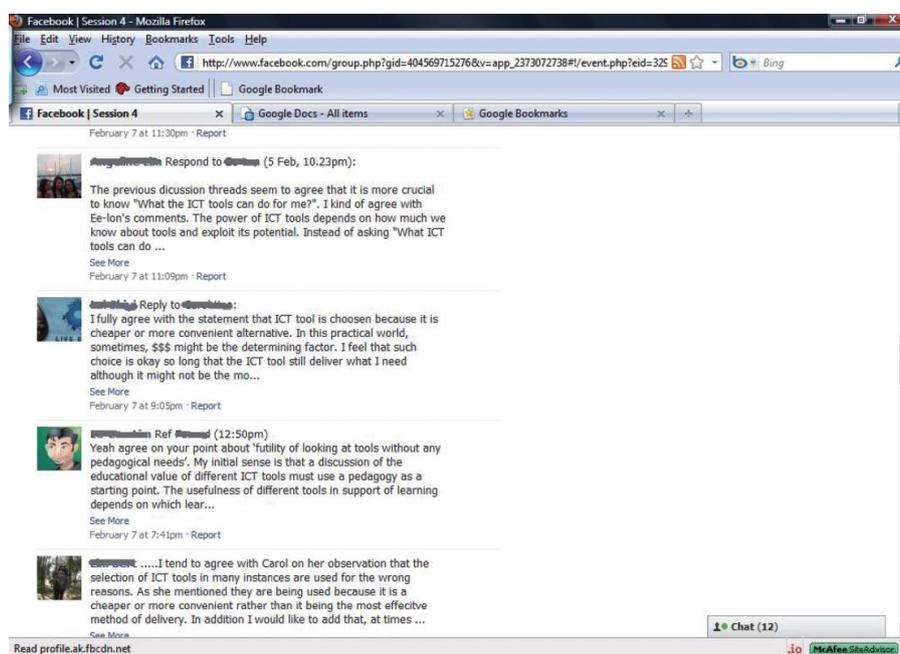


Figure 2 Discussion board usage (from Wang et al., 2011)

Another example of created content is displayed in Figure 3, where each photo is accompanied by a corresponding description that explains the content of the photo and the thought process behind it.

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Figure 3 Media content generation with Facebook (from McCarthy, 2009)

The uploaded photos can be tagged with words, Facebook users or linked to events, which facilitates students when searching for specific materials.

4.3. The instructor's role

Computer-based collaborative learning in general supports the conversion of instructor's role to a facilitator. This requires a significant mentality change, where the instructor stops having full control of the learning process, is not the only one delivering knowledge and/or participating in the classroom. However, this control shift faces many difficulties that have not yet fully been overcome (Bae, 2010). More specifically, "Values such as horizontality and openness are not simple changes to the educational design but imply a special effort to be made along many different lines in order to change a 1.0 paradigm which is more ingrained in our teaching minds than we had thought" [Fernández and Gil-Rodríguez, (2011), p.45].

However, when students not only collaborate and participate in class but they are required to generate content, instructors are required to not only observe the process, but also offer some guidance and interfere when necessary. This occurred in the majority of the studied cases, where instructors mostly moderated the content produced and the collaboration and interfered to give correct information, answer questions or adapt the groups in case of conflicts.

Apart from the role of the facilitator, in 15 cases instructors participated in the content production. More specifically, the activities with which they created content included:

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- Initiation of discussion amongst students by asking questions regarding course-specific topics or assignments (C4, C6, C8, C9, C11, C16). Instructor’s presence is essential for the students’ subject-related interaction.
- Addition of material such as links to course-specific sources (C3, C10, C15, C16, C17, C18). This way, students were provided with extra information regarding the learning units being taught and they were able to broaden their knowledge without limiting their reading material to the traditional school book.
- Addition of resources such as educational videos and photos (C3, C12, C15).
- Answering students’ questions on the group wall when no answer from other students was provided (C5, C12, C19).
- Communicating with students by sending individual or group private messages that cannot be accessible to the public (C10, C12, C13, C17).

Even though instructors’ role is significantly less authoritative, it is still essential, according to van Rooyen and Pieterse (2009). The authors compared a formal and an informal student discussion forum and deduced that discussions between students have higher educational value when they are guided and regulated. Moreover, it is pointed out in the relevant literature that students rarely initiate discussions on online environments where their views will be visible, and therefore open to judgement, by other classmates and most importantly the instructors (Selwyn, 2007). This is indeed verified by the fact that instructors were frequently forced to initiate discussions students would not start on their own and answer questions that would otherwise remain unanswered.

Therefore, it is important that instructors devote significant amounts of time not only participating and contributing to the content, but also prompting students to engage in multiple activities that will help their on-going and final performance. To ensure such participation, instructors can design various Facebook’s usage scenarios, which include assigning specific tasks to students. These tasks needs to have clearly designated goals and should point out with which tools/activities students will be able to successfully execute them. This way, students will not randomly navigate through the environment without academic purpose, which usually leads to non-relevant content, such as personal discussions, arrangements of meetings outside of the course’s scope etc.

As it was stated in the corresponding section, we employed a mainly explanatory methodology. Therefore, in the two following sub-sections we present the most prominent benefits and problems that were identified in the evaluation sections of the articles that describe the 19 case studies.

4.4. Benefits and problems from Facebook’s usage in education

There is evidence that Facebook’s employment in educational contexts benefited the learning process. The benefits observed by all cases are the ease of use due to users’

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familiarization with the environment as well as the promotion of social relations amongst students but also between students and instructors. More specifically, the identified benefits that are relevant to content generation are presented in Table 4.

Table 4 Benefits identified in the use cases regarding content generation

Benefit	Case identifiers	Sum
Student collaboration was promoted	C2, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C15, C16, C17, C18	15
Students learnt	C1, C2, C4, C6, C7, C8, C12, C14, C15, C16, C17, C19	12
It is student-centred	C3, C4, C5, C6, C9, C11, C12, C13, C15, C16, C17	11
Variety of discussions / interactions were realized in a constructivist way	C4,C5, C6, C8, C10, C11, C12, C15, C17, C19	10
Participation increased	C2,C4, C6, C7, C9, C10, C12, C15, C16, C19	10
Participative learning was supported in a constructivist way	C4,C6, C8, C9, C12, C14, C16, C17, C19	9
A repository of student-generated data was developed	C1,C 8, C9, C13, C14, C15, C17, C19	8
Knowledge was shared among students	C3, C8, C12, C13, C14, C15, C17	7
Students got help with solving problems	C4, C5, C7, C11, C13, C14, C16	7
Students exhibited critical thinking	C4, C6, C7, C11, C14, C19	6

The most commonly identified benefit was the promotion of student collaboration with the usage of multiple synchronous (live chat) and asynchronous (discussion forum, wall, private messages) communication tools. Through constant and multimodal collaboration, students were able to collaboratively compose meaningful content that represented a variety of different viewpoints on the taught learning units.

Additionally, 12 case studies emphasised on the fact that students’ involvement in Facebook led to their knowledge acquisition and comprehension. Since UGC requires users’ creative effort, students did additional independent research on the subject course in order to add value to existing information. This was allowed by Facebook’s environment, as recognized by eleven case studies, which is student-centred and therefore enables students’ active role in creating content.

Moreover, 10 case studies pointed out that students realized a variety of discussions and interactions throughout the course’s duration. Instructors promoted some of these when corresponding encouragement to start a discussion was needed. Thus, participation increased because students were motivated to engage in Facebook’s activities and the majority of students were already familiar with the environment and were used to enjoy spending their time with it.

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A significant benefit that was indicated in 50% of the case studies was that participative learning was supported in a constructivist way. Students’ participation in Facebook allows the constructivist creation of content. More specifically, the variety of tools that students can use help them create new knowledge by exploiting existing information (e.g. wall posts, links, videos) and creating new meaningful knowledge based on their own research and/or personal views (e.g. notes, tagging, page).

Moreover, as indicated by 8 case studies, all student-generated data that was developed composed a repository that will be exploitable and extensible for future users. This data includes all posts and discussions that were documented and will be accessible for future reference (wherever the access rights allow it) as well questions/answers that were saved, so that the same of future students can look them up.

Another benefit documented in 7 cases was that knowledge was shared. This sharing stems from the constant interaction amongst students during discussions in the Wall and the discussion board. Thus, students’ role becomes more active in the learning process and they are more comfortable with providing and receiving knowledge.

The last benefits pointed out refer to the development of two essential and transversal competencies during content generation by students, namely problem solving and critical thinking. More specifically, whenever problems occurred regarding their assignments students got help with solving them by their classmates or their instructors. This saved valuable time that would be wasted in online search but more importantly encouraged students to learn how to solve problems and issues while helping their classmates. Additionally, students exhibited critical thinking while endeavouring to answer other students’ questions regarding leaning materials or assignments, which leads to more substantial content generation. This was also ensured because they were required to solve arising arguments by collaborating and posting their arguments on the online environment.

Even though the aforementioned benefits are encouraging towards Facebook’s future integration in education, several studies (Bunus, 2010; Estus, 2010; Schroeder and Greenbowe, 2009; Szwelnic, 2008) point out that further research on the topic is needed for more solid results.

Apart from the benefits presented, the implementation of Facebook within educational contexts created several problems. Representative issues identified that focus on content generation are presented in the following table.

Table 5 Problems identified in the use cases regarding content generation

Problem	Case identifiers	Sum
Limited tools suitable for education	C4, C6, C7, C8, C10, C11, C13, C18	8
Privacy	C1, C4, C10, C13, C15, C17, C18, C19	7

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Students might not participate if there is no incentive	C7, C10, C13, C17, C19	5
Reluctance to post	C4, C13, C17, C19	4
Repetitive questions	C6, C7, C8, C13	4
Irrelevant posts	C4, C13, C14	3
No feedback/answer to all posts/questions	C4, C12, C13	3
Being misled by incorrect statements made by other students	C4, C11	2
Distraction from other things on FB	C4, C8	2

The most commonly mentioned problem is the lack of sufficient tools that could convert Facebook into a holistic educational tool for content generation. For example, there is no way to upload files as in learning management systems (i.e. organized in folders). Moreover, there are no editing functionalities for posts already submitted. Another limitation is that instructors were not able to save records and grades in a customized manner, as Facebook is not a flexible environment that supports personalization and configuration.

Additionally, even though most cases created Facebook groups that were close and only accessed by their members, students remained reluctant to contribute their thoughts in fear of public access by their not classmates “friends” but they were also afraid of being judged by their classmates and teachers.

Another problem encountered was the inability to ensure that students will sufficiently contribute content. Other than the possibility of learning, an active participation in Facebook is sometimes not an adequate incentive since it implies additional work for the majority of the students and therefore could result in limited content generation.

Moreover, 4 case studies mentioned the possibility of repetitive content creation. This occurs because Facebook’s environment does not allow for easy content organization and structure, and therefore some students had to ask the same things when they could not easily check if someone else had also asked at a previous post. On the other hand, 3 cases referred to the lack of content since some questions remain unanswered and feedback is not always given whereas three other cases pointed out that not all content generated is relevant to the course subject. Additionally, since students added the majority of the posts, some were concerned of being misled by other students’ inaccurate postings or answers to their questions. Especially when the answers refer to assignments, there is the issue of competition that might result in confusing or wrong posts.

Lastly, 2 case studies pointed out that Facebook’s other functionalities such as games, other non-educational posts that appear in their main feed, could distract students from generating correct and related to the learning units content.

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The aforementioned issues support existing literature suggesting Facebook cannot become an official repository of course material and therefore replace Learning Management Systems such as Moodle, Atutor etc (deVilliers, 2010). Most importantly, even though Facebook’s tools allow for content creation, additional applications are required that would transform Facebook to a suitable educational tool (Bunus, 2010; Fernández and Gil-Rodríguez, 2011; Loving and Ochoa, 2010; McCarthy, 2009; Rambe and Ng’ambi, 2011; Wang et al., 2011).

5. Conclusions

This paper examined how Facebook’s application in academic contexts enables students to generate meaningful educational content. To this end, 19 cases studies that applied Facebook in university-level courses were studied. The general consensus from the cases’ investigation is that Facebook provides a suitable environment for content production by its users. This is in accordance to literature that states Facebook abides by the constructivist theory principles; hence students learn better when they produce information that others will see, use and review, such as occurs in Facebook (Parslow et al., 2008). The iterated usage and contribution to the environment lead to the establishment of a constantly enriched repository with multimedia content that can be exploited in the future by Facebook users. More specifically, the majority of cases indicate that Facebook includes a variety of tools and activities that support content creation, such as the Wall, notes, photos / videos / links etc.

The aforementioned tools were used by students who engaged in activities that generate content valuable to them and to future students that will access the Facebook pages/groups/profiles. Such activities were questions asking and answering, discussion of the subject materials, collaborative assignments solving, information sharing and assignments publication. This finding reaffirms the notion that social networking websites are participatory platforms where users are producers of content (Parscal, 2010).

Another factor intended to be examined was how the instructors helped and/or contributed in content generation. As it was observed, instructors took on the role of a facilitator rather than a tutor, while at the same time they participated in the content generation process. This participation included the addition of subject-specific material to help students expand their knowledge, answering of questions regarding learning units as well as assignments, posting of announcements as well as interference in discussion groups where it was needed. Apart from creating content, instructors also communicated with students with Facebook, using the private message and online chat. These findings reaffirm suggestions of relevant literature that points out learning should be social and collaborative (Phillips et al., 2007).

The corresponding section within the article lists a variety of benefits that focus on the educational value Facebook adds to the learning process. These benefits led to an increased

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motivation to participate in the learning process by using Facebook, which in turn enabled students to develop critical thinking, construct knowledge as well as solve problems with ease by communicating with their group members and interacting with Facebook’s tools. Relevant literature also indicates the combination of knowledge generation and competences development as benefits in the learning process (Kulmala and Stanton, 2009; Meyer, 2003).

Lastly, a number of problems were observed during Facebook’s usage in the examined cases. The most important issues were related to the lack of a sense of privacy, which is also stated in literature on social networking websites (Cain, 2008; Towner & Muñoz, 2011;). More specifically, students were reluctant to share information, personal thoughts and arguments with their classmates and instructors. Another problem was that the generated content was not always relevant to the subject course and sometimes contained inappropriate wording.

In summary, our work supports other studies suggesting further research on the topic is needed, since the incorporation of social networking websites in education is still at an early stage and no concrete success results have emerged that lead to the development of best practices or pedagogical models. Furthermore, research is required for the appropriate design of courses that will use Facebook as a tool for user-generated content. This will facilitate the adaptation of the course in case the aforementioned problems occur and the exploitation of the corresponding benefits according to the course’s specific objectives.

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Tables and Figures

Table 1 List of cases included in the literature review

Identifier	Source	Course	Facebook usage	Students	Country
C1	(Al-Atabi and Younis, 2010)	Thermodynamics and Heat Transfer Module	Facebook group, closed	60	Selangor, Malaysia
C2	(Bae, 2010)	-	Facebook, invitation only	15-25	Chicago, USA
C3	(Bunus, 2010)	Design Patterns (Computer Science)	FB page (open, so everyone can join)	170-180	Sweden
C4	(de Villiers, 2010)	Concepts and Principles of e-Learning	FB group, closed	30	South Africa
C5	(English and Duncan-Howell, 2008)	Business education	FB group, closed	28	Australia
C6	(Estus, 2010)	Geriatric pharmacotherapy	Facebook group, closed	30	Rhode Island, USA
C7	(Fernández and Gil-Rodríguez, 2011)	2.0 Travel: on-line tools and resources	Two FB groups, (closed)	27	Spain
C8	(Fouser, 2010)	Korean Language and Culture Education (teacher education)	FB group, private	11	South Korea
C9	(Kayri and Çakir, 2010)	Computer Networks and Communication	(2) FB groups, open	31 and 27	Turkey (2 Universities)
C10	(Loving and Ochoa, 2011)	BA Honors Research Methodology	FB group, private	17	Florida, USA
C11	(McCarthy, 2009)	Imaging Our World	FB group (IOW) open	100	Adelaide, Australia
C12	(Ractham and Firpo, 2011)	Introduction to MIS (Management Information Systems)	Facebook group “IS201” Group, closed	69	Bangkok, Thailand

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C13	(Rambe and Ng’ambi, 2011)	Information Systems	Facebook group, closed	165	Cape Town, South Africa
C14	(van Rooyen and Pieterse, 2010)	Advanced data structures and algorithms using C++ and Program modelling and design	FB group started by students (informal) open	63	Pretoria, South Africa
C15	(Schroeder and Greenbowe, 2009)	Introductory organic chemistry laboratory	Facebook group “Chemistry 231L”, closed	52	Iowa, USA
C16	(Skiba, 2010; Sherrill and Breed, 2010)	Maricopa Nursing Laboratory	FB profile (open)	792	Phoenix, Arizona, USA
C17	(Szwelunik, 2008)	Business in Context	Facebook group	60% of students	Oxford, UK
C18	(Wang et al., 2011)	Teacher education	One FB group	31	Singapore
C19	(White, 2009)	English language course for students of the tourism industry	Facebook group, secret	9	Kyoto, Japan

Table 2 Tools that were used on Facebook

Tool	Case identifiers	Sum
Wall	C1, C2, C3, C4, C5, C6, C7, C8, C10, C11, C12, C13, C14, C15, C16, C17, C18	17
Discussion Board	C1, C3, C4, C5, C6, C7, C8, C10, C12, C13, C14, C15, C18, 19	14
Photos	C3, C5, C6, C7, C8, C11, C12, C15, C16, C18	10
Links	C3, C4, C6, C7, C14, C15, C16, C17, C18	9
Videos	C3, C5, C12, C16, C17, C18	6
Private Message	C10, C12, C13, C17, C19	5
Quizzes	C1, C3, C12	3
Events	C6, C11, C18	3
External apps	C6, C10, C18	3
Discussion (on Wall or Board: unknown)	C2, C9	2
Live Chat	C10	1
Tagging	C12	1
Notes	C3	1
Other FB apps	C3	1

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FACEBOOK tools

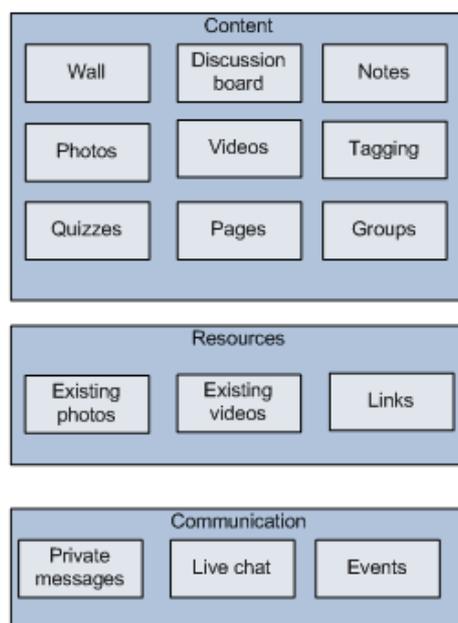


Figure 1 Categorization of Facebook tools

Table 3 Activities that took place on Facebook

Activity	Case identifiers	Sum
Students asked questions about the subject (e.g. theory which they hadn't understood)	C1, C2, C7, C10, C12, C13, C14, C17	8
Continuation of in-class discussion and discussion of the material, students' thoughts about it, etc.	C2, C4, C6, C8, C9, C15, C17, C19	8
Students asked for help/advice on assignments, solving problems, etc.	C3, C5, C10, C12, C13, C14, C15	7
Students shared information, resources, links, etc.	C4, C7, C9, C12, C13, C14, C18	7
Instructors provided links, material, etc.	C3, C10, C15, C16, C17, C18	6
Assignments were posted and commented on (or not) by other students	C6, C7, C11, C12, C17, C19	6
Making announcements about deadlines or asking for such information	C3, C10, C13, C16, C18	5
Students shared their experiences	C5, C7, C8, C12, C14	5
Students got feedback from others	C4, C6, C12, C15, C18	5
Students practiced on the material (quizzes, questions)	C1, C3, C12, C19	4
Students collaborated on assignments and shared solutions (after the deadline)	C12, C14	2

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Submitting coursework	C10	1
Students complained about class	C14	1

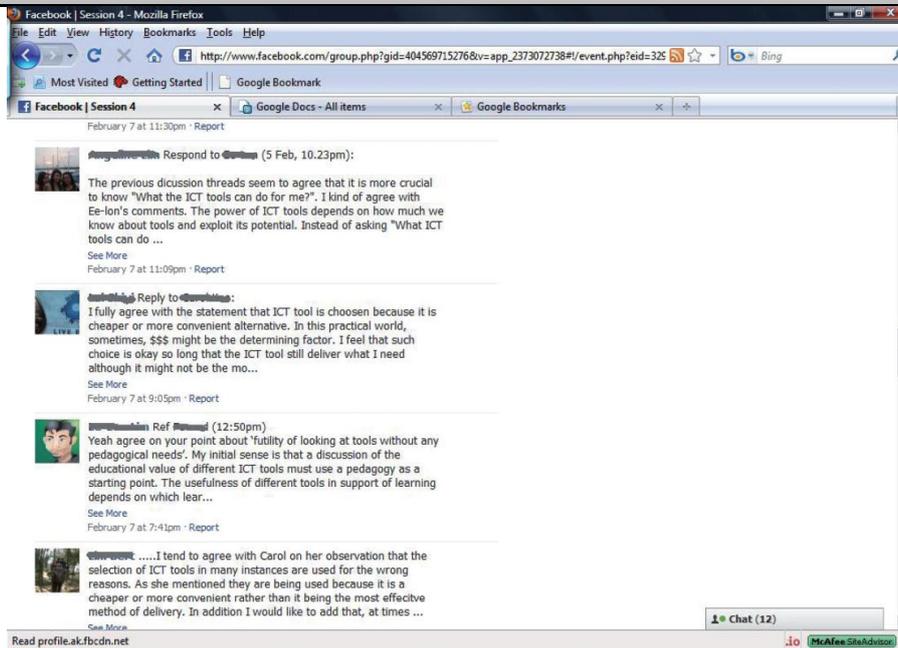


Figure 2 Discussion board usage (from Wang et al., 2011)

Photos from IOW Gallery one

Photo 40 of 49 | Back to Event | See All Photos

Previous Next



Figure 3 Media content generation with Facebook (from McCarthy, 2009)

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Table 4 Benefits identified in the use cases regarding content generation

Benefit	Case identifiers	Sum
Student collaboration was promoted	C2, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C15, C16, C17, C18	15
Students learnt	C1, C2, C4, C6, C7, C8, C12, C14, C15, C16, C17, C19	12
It is student-centred	C3, C4, C5, C6, C9, C11, C12, C13, C15, C16, C17	11
Variety of discussions / interactions were realized in a constructivist way	C4, C5, C6, C8, C10, C11, C12, C15, C17, C19	10
Participation increased	C2, C4, C6, C7, C9, C10, C12, C15, C16, C19	10
Participative learning was supported in a constructivist way	C4, C6, C8, C9, C12, C14, C16, C17, C19	9
A repository of student-generated data was developed	C1, C8, C9, C13, C14, C15, C17, C19	8
Knowledge was shared among students	C3, C8, C12, C13, C14, C15, C17	7
Students got help with solving problems	C4, C5, C7, C11, C13, C14, C16	7
Students exhibited critical thinking	C4, C6, C7, C11, C14, C19	6

Table 5 Problems identified in the use cases regarding content generation

Problem	Case identifiers	Sum
Limited tools suitable for education	C4, C6, C7, C8, C10, C11, C13, C18	8
Privacy	C1, C4, C10, C13, C15, C17, C18, C19	7
Students might not participate if there is no incentive	C7, C10, C13, C17, C19	5
Reluctance to post	C4, C13, C17, C19	4
Repetitive questions	C6, C7, C8, C13	4
Irrelevant posts	C4, C13, C14	3
No feedback/answer to all posts/questions	C4, C12, C13	3
Being misled by incorrect statements made by other students	C4, C11	2
Distraction from other things on FB	C4, C8	2