NEW AREAS OF QUALITY IN HIGHER EDUCATION
A comparative and trend analysis

BITSEARCH, THE BLOG BEFORE THE THESIS

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1. SUMMARY:

This paper presents BitSearch, a web blog written by a team of thesis students where they share the evolution of their work. The blog is aimed at improving the communication not only between the advisor and the students, but also at motivating the student through the public exposure of the research development. Basic writing guidelines are provided by the professor in order to guarantee the quality of the posts and provide good metadata for their retrieval, both by author or by a generic text query from a search engine. After one year online, BitSearch has published 176 posts written by 19 students, in addition to the professor's own contributions. Statistics show more than 7,000 accesses their pages from visitors from more than 100 countries all over the globe. The blog tool has helped in improving the guidance on the students activity, developing a sense of team work among authors as well as a more progressive preparation of the final dissertation.

2. KEYWORDS

blog, online learning, web-based tools
3. DEVELOPMENT

a) Objectives

The writing and defense of a thesis is a common activity at the end in many high education studies. During the thesis development, the student is expected to apply the skills gained during the study program to a research or development project supervised by a professor. As a result, the student normally writes a report and exposes the work done in front of a committee that evaluates it. A common practice in the last years has been the publication of thesis in public repositories that provide open access to the work and results obtained by the student. [1]

This paper proposes an additional method for the publication of student's work by using a different format: a *web blog*. In this case, the goal is not a formal publication but a live collection of short texts that report on the advances of the student's thesis. This practice, previously applied in regular courses [2], brings several improvements in the guidance of the student work as well as visibility of the task performed.

From a general perspective, Doctors Fernette Eide and Brock presented a set of qualities of writing on a blog from the neuronal point of view [3]:

- Promote critical and analytical thinking.
- Powerful promoter of creative, intuitive, and associational thinking.
- Promote analogical thinking.
- Powerful medium for increasing access and exposure to quality information.
- Combine the best of solitary reflection and social interaction.
Based on these qualities, Richardson [4] proposed some possibilities for the pedagogical use of blogs in education:

- comments based on literature readings and students responses.
- a collaborative space for students to act as reviewers for course-related materials.
- images and reflections related to industry placement.
- an online gallery space for review works, writings, etc. in progress, making use especially of the commenting feature.
- teachers encouraging reactions, reflections and ideas by commenting on their students' blogs
- development of a student portfolio of work.

If focusing on the thesis advisor point of view, the reports on the blog provide an excellent tool to supervise whether the student is comprehending the key aspects of the thesis as well as following the given work plan. The blog also becomes a marketing tool to attract future students and a knowledge repository for other students and professionals who can learn from the thesis experience.

From the students' perspective, the publication of the texts introduces a social factor to their job. They obtain a tool that allows them to easily share their academic work with their friends and relatives, breaking the isolation that this type of tasks sometime implies. The first readers of their texts are the blog co-authors, normally class mates with whom establish a sense of team work. Moreover, most blog sites are indexed by web search engines, making their work available to a global audience. Receiving comments from remote countries adds an extra motivation for them as they see their work valued by strangers. Finally, the blog posts provide them with a valuable tool when looking for a job as any employer can easily check the student's credentials and learn about their skills by reading their texts.
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b) Description of the work

This paper presents the writing process of BitSearch [4], a web blog written by a group of electrical engineering thesis students who share the same advisor. The collaborative writing of a publication such as a blog requires a work flow to reduce conflicts and guarantee the quality of the texts. The different stages of the activity are described in this section, which run in parallel to the regular development of a thesis.

b.1) Students enrollment

The first step in the process is the agreement between student and professor about the thesis topic and guidance methodology. Thesis topics are generally related to the research activity of the advisor, who possess previous experience and knowledge on the area. On the other hand, the student does not have in general a deep understanding on the topic, so it is advisable to provide some introductory documentation for motivation. This material has been traditionally a previous paper or thesis related to the new research but, in the framework of the presented blog, a new source is available and may result even more efficient.

The student is addressed to the blog posts related to the proposed thesis topic to learn about the previous work and status of the research in the lab. In parallel, the student becomes familiar with the type of texts published and their style, as well as becomes aware of who has been working on the topic until the date.

Moreover, the prospective student is aware that the guidance by the professor requires from his/her side the regular report of progress under the form of a blog written in English. Given that in the described case English is not a mother tongue for students, this requirement might become a filter when accepting students. The activity could, of course, be completed in any language
agreed between professor and student but not using English nowadays would probably reduce the global impact and visibility of the publications on the web.

This stage of the activity ends with the commitment from the student to write on the blog as one of the tasks related to the thesis completion. In most web blog platforms, it is required that the professor sends to the student an invitation to join the team of authors and that the student completes a form to create a public profile associated to his/her user account.

b.2) Publication schedule

The writing on the work is a collaborative task that involves several students and the professor. Whenever a new text is published in a blog, the text appears at the top of the web page to gain visibility. As every author wants his/her texts to be read, it is advisable to establish a policy to guarantee opportunities to all authors to occupy this position. For this reason, a weekly publication plan should assign a publication day to every author.

In the presented work, full time students were asked to publish once a week. This frequency of publication was considered optimal as students are used to weekly schedules in their regular study plan and, moreover, it matched a basic meeting schedule with the professor of once or twice a week.

However, there was a second profile of students who were actually following their thesis program in another university in the framework of a mobility program. In this case, the role of the professor promoting the blog was secondary as their main advisor was in the hosting university. Mobility students also became blog writers but the propose is not so much the research guidance but a monthly report on their progresses and work. Thanks to this communication channel, the activity of a student in a remote university can be tracked to certify the quality of their work once the student presents is back to the university of origin.
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b.3 ) Composition guidelines

Before their first contribution, students are requested to read a document providing a list of good practices on blog writing. These guidelines are aimed to obtain a certain homogeneity throughout the posts style and to avoid common mistakes to beginners.

- **Title**: Students are advised to write the title of the post when the whole text is finished. This practice helps to choose a title is coherent with the post content because, if done the inverse order, it might result in a misleading headline. Student must be advised not to use too generic titles that describe the whole of their thesis but focus on the topics tackled in the post. The title should include the keywords that a potential reader may use when querying a search engine for the information contained in the post. A good exercise to find a good title is to remember what keywords had been used during previous web search by the student to find the sources used while writing the text.

- **Style**: Plain language is recommended to make the blog accessible to a broad audience, an exercise that forces students to truly comprehend and reflect about the logic and reasoning that sustain their work. Students are asked to consider their class mates as the target audience. This reader profile is supposed to have a basic knowledge about the topic and should enrich his/her expertise by reading the blog.

- **Composition**: Most blog platforms include an online HTML editor that fulfills most of the authors needs. With it, it is possible to write text, format it as bold and italic, embed figures and videos as well as create links to external resources. It is strongly advised not to use an external text editor that would introduce formatting styles, such as the WYGIWYS solutions of *OpenOffice*, *Google Docs*, *Apple Pages* or *Microsoft Word*. Doing so would probably result in a distortion in the style of the published text, different from previous posts. If it is not possible to use the online editor at composition time, the best practice is to use a simple text editor that will not introduce any format to the text.
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- **Extension**: The length of every post should be around two hundred words and entries must be concise and synthetic, as the this is the type of information most readers expect to find in blogs. Too low level details as discouraged if they make the reading too dense. If this is the case, the professor should advise the student to move the details to the academic thesis document.

- **Figures**: Every post should include at least one graphical element, such as an image or a video. Embedding figures in articles makes the text more attractive for potential readers and simplifies the composition, as references to graphical elements are often more effective that detailed and long sentences. The nature of the figures can be very diverse, but four main categories can be defined in the case of a thesis blog in the context of engineering studies. The first category are the *schemes* of the different blocks and their interconnection, a type of figure that describes the architecture of the system. A second option are *captured* photos, videos or screen shots of an implemented solution. Thirdly, *generic* figures or photos that refer to an abstract concept that appears in the text, such as “success”, “failure”, “joy”, “stress”; more aimed that expressing an emotional feeling experimented at a certain stage of the thesis. Finally, *graphics and tables* offering the results commented in the text and obtained after a data analysis. Those figures generated by the student are to be considered for inclusion in the final thesis dissertation, both for the academic document and the oral defense.

- **Links**: Whenever possible, posts should be self-contained to facilitate their reading. In those cases when the topic is highly related to previous work, a link to the previous posts must be included in order to avoid the repetition of ideas. The text must include links to the external sources that have been used to develop the related topic and, in case of very technical terms, a basic definition of their meaning. If the nature of the post is the definition of a basic concept and this cannot be found in any external website, students are encouraged to generate it in an external knowledge repository. In the presented experience, most authors have previously written articles on the Wikipedia as part of their
study plan [6], so they already have the skills to fulfill this task and contribute to this repository.

- **Tags**: An easy retrieval of previous posts is a key aspect for the success of the activity. Most blog platforms allow the addition of textual tags that index posts according to the categories defined by the authors. Texts annotated with tags are easily retrieved, normally, by clicking on the tags, which are visible on the same web interface. There are two basic situations where tags are very valuable: keyword and author tags.

*Keyword tags* are associated the research topics and should match the terminology used by the scientific community. The introduction of these tags, often suggested by the advisor, familiarize the student with the vocabulary they find when reading research papers and that in many cases is novel to them. Indexing by keywords allows, for example, providing the student with the blog posts they must read during the enrollment stage, as previously described in Section b.1). It is important to limit the amount of keyword tags as the natural tendency of students is to add new tags, sometimes redundant with previously existing ones. By keeping a moderate number of keyword the list of tags shown on the web interface will remain useful. The dynamic nature of research makes it almost impossible to define a finite number of tags, as they may evolve after years. It is advisable that the professor suggests these tags and acts as the editor of the blog, constantly considering their split into more concise ones or merge into a broader term.

*Author tags* identify the author and must always be included in every post. The retrieval of posts belonging to the same author allows the evaluating the work of the student over time. They provide a valuable tool for thesis jury to assess the evolution of the research presented in the academic document. Moreover, this option is also interesting for students when entering the job market, as they can easily show their work and writing skills to perspective employers. In some web blog platforms it is not necessary to explicitly add author tags as they already allow the retrieval of author posts from their profile pages.
b.4) Life cycle of a blog post

The publication of a blog post is a process that follows a workflow similar to any publication. This subsection describes a sequence of steps synchronized to the development of a typical thesis.

1. **Subject decision**: Most methodologies for thesis supervision include regular weekly meetings between student and professor to review the advances on the thesis and discuss the future steps. The agenda of these meetings must include the definition of the subject for the next blog post. The nature of the topics generally follow the logic development of the thesis. Next Section b.5) provides a proposal of stages to follow and hints for guiding posts in each of them.

2. **Post writing**: Once the student has collected all the necessary data to write the post, it logs in the system and produces the text according to the guidelines described in Section b.3). Most blog platforms allow the preview of the post and can save the content until the publication day assigned to the student.

3. **Review**: The professor must review all published posts and provide some feedback to the author. This process is conducted through an online forum where all authors are subscribed. By doing so, the rest of the authors become aware that a new text has been published and reviewed. Sharing the professor's feedback among all students can help the rest of authors to learn from other author's good practices or mistakes, as well as providing their own suggestions and questions.

The review of the text must tackle the two aspects of the post: the content and the format. The content review focuses on the research topics involved with the thesis. Reading a technical text written from the student's point of view of the work is an excellent opportunity to detect errors, unclear issues or new approaches. The advisor should address all these aspects, by correcting students mistakes, posing questions or commenting the new ideas. On the other hand, the format review is addressed at
improving the writing skills of the student. In several cases, it will be necessary to insist on the instructions provided in the authors guidelines, especially in the first contributions of every author. On other cases, the professor will provide observations on the usage of English for technical writing.

The review process can be completed by an external reviewer, normally somebody from academia or industry, who is a specialist on the post topic. A good candidate would be a professional contact to the professor who may be willing to collaborate with the blog at the same time that learns about the research activity of the professor's team.

4. **Update**: After receiving the feedback from the professor and co-authors, every student may have to introduce modifications to the previous version of the text or just answer back to the reviewers using the same online forum. In case of a severe discussion, this can be postponed until the next meeting with the professor.

5. **Promotion**: Finally, when the definitive version of the post is ready, it is advisable to promote it among potential readers. Promotion is normally initiated by the author and/or the professor, who are interested in distributing the text to obtain feedback and recognition.

There exist nowadays several methods based on the infrastructure provided by Internet. A first option is an e-mail directed to those people who are potentially interested in the post content. University colleagues are the main candidates to receive these alerts, as they are among the targeted audience of the blog. However, the volume of e-mails should be moderated and it is preferable to convince those colleagues to subscribe through RSS feeds to the blog. These same feeds could be embedded in the professor or research group web page, a good strategy to attract visitors to the blog and that would at the same time provide dynamics to a type of websites who tend to be too static.

Promotion could be more efficiently achieved by using social networks. These systems are designed to raise awareness on online resources to a very targeted audience. Social
sites (eg. Facebook or Twitter) can recommend content to an audience that may be especially interested on the text, as they are personally linked to the authors. In the case of students, this practice is especially new as they may be showing for the first time the results of their academic work to a broad audience that includes relatives and friends. Posting content on this type of sites will also increase the awareness on the student's social circle about their thesis and this may improve the level of emotional support in a task that, in some cases, produces a personal stress.

The presented steps try to naturally integrate the publication of blog posts in the process of a thesis. The online tools available for quick publication and consumption enormously simplify the whole process and allows the thesis to reach a broader audience. However, all these steps must always be adapted to every thesis requirements, scheduling and student profile. The proposed methodology can be applied to motivate the necessary dedication and attention from the student to complete the work plan, but at the same time, it should not create unnecessary stress due to weekly publication deadlines.

b.5) Types of posts

Writing on the blog should be naturally integrated in the process to complete a thesis. The best topics are those that help students to focus on those subjects that will guide them into achieving the thesis goals. As academic thesis tend to follow a fixed sequence of stages, the best sequence of blog topics are those that match this sequence. This section is intended to provide ideas to advisors using similar work plans but, if this is not the case, they can still provide hints on what kind of posts could be published.

1. **Topic definition (Figure 1a):** The first post on the blog should help the student to fully understand the goal of the thesis. The text starts with a brief presentation of the author, who could add a link to his personal web page so that the reader can learn about the writer's background. The thesis context should also be presented, defining whether it will
be developed in a university department, an external company or institution or in the framework of an exchange program. After that, it should provide arguments to support the interest and motivation of the thesis, clearly specifying what is the expected contribution of the final work. This introductory post will ensure that both parts, student and advisor, have a full agreement and understanding of the joint work they will complete in the following months.

2. State of the art (Figure 1b): Any research work should begin with a study of the existing solutions from previous authors. This stage requires the student to familiarize with the problem and its associated vocabulary and methodologies. Many thesis advisors provide the student with a collection of selected papers that provide a starting point for the research. These papers are read by the student to be later commented with the professor. The blog offers an opportunity to complement this discussion with a short written summary of the paper, an exercise that motivates the comprehension of the related work. As the student must publicly explain the paper in his/her own words, the full understanding of the paper is ensured. If the student encounters difficulties while reading the paper, these must be discussed with the professor and are advised to be included in the blog post, as they may help other readers.

Another type of blog posts related to the state of the art would be those ones that compare existing approaches to the addressed problem. This analysis helps understanding what features should be analyzed in the developing to be able to compare, at the end of the thesis, the obtained results with those already published as the state of the art.

The review of other author's work is also an excellent opportunity to establish contact with these other researchers working on similar topics. If considered appropriate, the blog post could be sent to the paper's author for review. This promotion could arise the awareness of the thesis among the scientific community and motivate the collaboration with external partners.
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These type of blog posts must always include a link to the original work to facilitate the access to the original source of information. The names of the authors must appear to and it is advisable to also include links to their home pages or web sites of their institutions. The inclusion of figures appearing in the papers is a practice subjected to the copyright terms of the publication and has to be checked in every case.

3. Proposed solution (Figure 2a): Once the goal is set and the existing solutions analyzed, the more creative part of the thesis begins with the author’s contributions. The student should combine the lessons learned from the state of the art with the advisor’s proposals and his/her own creativity. As a result, a new design or procedure should be proposed in
the blog, clearly specifying what are the main contributions, innovations and expected results. This design could be expressed with a block diagram of connected subsystems or steps that should be fulfilled to build the complete solution.

This type of blog posts draw the route map for the thesis completion and must be written from a high level of abstraction. Implementation details are not advised to be included yet as in many cases they may vary a lot along the thesis timeline. This blog post should be a guide for future texts as the different parts of the design are candidates to have a dedicated post in the future.

Work plans may change due to multiple circumstances, such as the discovery of more promising techniques, errors in the initial proposal or changes in the initial requirements. This modifications, also common in the professional world, may require a review of the proposed solution. If they are relevant enough, new blog posts can be generated explaining the reasons of the changes and how they affect the thesis development.

4. Development (Figure 2b): Together with the state of the art articles, the blog posts focusing in one aspect of the execution of the thesis are the most interesting for the general audience. Despite being included as part of a series of articles related to a thesis, these posts should be as much self contained as possible to simplify their understanding for those readers whose first contact with the blog is one of this articles.

The development posts could start with an introductory paragraph where the covered topic is put in the context of the thesis. This paragraph may contain links to a previous posts so that, in case that a first time reader wants to learn more about the project, he/she can easily access the introductory posts.

This type of texts should describe what techniques were chosen, the reason why they were selected and how they were applied. By doing so, a reader with the necessary resources should be able to repeat the steps followed by the student. The aim of these posts are to help readers with a similar problem to solve them with a faster learning curve.
than the user. In many cases, students must collect information from different sources and combine them to solve a difficult problem. By sharing the process with the world, the student is contributing to the knowledge repository offered by the web. For example, a typical development post will explain how a piece of software is installed, configured and run, a classical resource that is often searched online by users.

It is advisable to publish some evidence that the problem was solved, such as a multimedia document showing the results. In case of real world results, audiovisual documents can be captured with a camera or microphone, while computer generated data could also easily be acquired by a screen capture software. Many blog platforms offer tools for online storage of this documents to be later embedded in the posts.

Figure 2: Examples of (a) Proposed solution, and (b) Development
5. **Results and conclusions (Figure 3a):** The final posts should report about the obtained results and include the student's thoughts and conclusions about the work. The goals described in the initial post must be evaluated, summarizing the steps followed and offering a global review of the project.

The inclusion of graphics and tables is recommended to synthesize the obtained results and, if possible, compare them with similar values collected during the state of the art phase. The analysis of these data should provide the grounds for the student's conclusions, which should highlight the main contribution of his work to the state of the art.

6. **Thesis completion (Figure 3b):** The last contribution of the student is after the thesis defense. In it, it can provide a more personal review of the thesis experience. This last post should include links to all related online material, such as the thesis document, the slides used at the oral defense and, if available, the video recording of the oral defense and related scientific publications in congresses or journals.

For the student, this last contribution can be personally relevant as it implies the achievement of an important milestone in the life of most graduates. The student must be encouraged to share his opinion on the thesis development, reviewing if it was a rewarding experience or, on the contrary, it will remain in his/her memory as a negative process. Finally, a reference to the experience as a blog writer is also advisable, evaluating if writing on the blog helped in the thesis achievement or it became an extra burden that was perceived as useless by the student.

From the professor point of view, this last post is a tool for the evaluation of his/her own task as advisor. As in any educational activity, the students feedback provides a very valuable source of information to improve the teaching quality as it improves the comprehension of students expectations as well as professors strengths and weakness. If possible, this last post should also be personally discussed, in this case, by switching the
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roles of learner and advisor: the student becomes the advisor that helps the professor into achieving his tuition dues.

Results and Conclusions
This week I present the results and conclusions obtained during the last weeks of my thesis.

The results vary depending of the video domain analyzed (football, news and parliamentary sessions). The first step has been made automatic annotation of the validation dataset for each descriptor and each configuration parameter of the K-NN classifier in a range of values.

For the soccer video, the best results were obtained with the Color Structure descriptor for a K with a value of 4, the detection rate for this combination is 85%. With this combination, the test dataset has been automatically annotated in order to determine the source of the errors.

The analysis of the detection rate of each camera, shows the source of the annotation errors (figure below). The global view camera has a good detection rate. However, the different cameras with close-up shots has less detection rates.

Figure 3: Examples of (a) Results and conclusions, and (b) Thesis completion

c) Results

c.1) Statistics

The presented blog, Bit Search, was created on the 18th February 2009, simultaneously with the beginning of the thesis of 4 thesis students. Three semesters later, the accumulated amount of total contributors has raised up to 20, as shown in Table 1. On average, the professor is the most active author, although in absolute numbers, one of the students is the writer with the largest
amount of contributions, with 29. The students following their thesis in the university tend to be more constant in their contributions, but the difference is not very significant with those students completing their thesis in the industry or abroad. If focusing in the students categories, in all of them are irregular contributions, with students who regularly accomplish their contributions as well as other students who require frequent reminders to post their new articles.

<table>
<thead>
<tr>
<th>Profile</th>
<th>Authors</th>
<th>Articles</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students in university</td>
<td>10</td>
<td>80</td>
<td>8</td>
</tr>
<tr>
<td>Students in industry</td>
<td>5</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>Students in mobility program</td>
<td>4</td>
<td>25</td>
<td>6.25</td>
</tr>
<tr>
<td>Professors</td>
<td>1</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>176</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Table 1: Number of authors and published articles

The publication of the texts on a web site provides the chance to use powerful statistical tools through web traffic monitoring. *Bit Search* uses the service offered by Google Analytics¹. In order to use this tools, it is necessary to register for a user account and embed in the blog site a piece of HTML code. Every time the blog receives a new visit, this code sends a signal to the web traffic monitor containing data about when it was accessed, which blog post was read, the origin of the visit and how much time does the visitor keeps that web page open. With all these data, it is possible to analyze the visitors profile and the traffic evolution on the blog.

The usage statistics shown in Figure 4 include the visits throughout the last year, with a total of 7,311 visits coming from 3,943 unique visitors. The growing tendency of the visitors graph can be explained by two factors. Firstly, the gradually establishment of the guidelines described in this paper, which have helped into an easier management of the publication and increasing quality of the posts. Secondly, the team of students has also significantly increased due to

¹ [http://www.google.com/analytics](http://www.google.com/analytics)
reasons external to the presented techniques. While in the first semester only 4 students were contributing to the blog, during the last semester 12 authors are regularly posting their texts in addition to the professor.

The two highest peaks are have their origin in a successful promotion, especially in the first case. The largest amount of visits in a day, 77, was registered with when an article talking about a social network (Twitter) was spread through this very same social network. The second peak corresponds to an generic analysis of the qualifications in a course taught by the professor, who was sent by e-mail to the students who had participated in that evaluation process. As in any web site, minim values correspond to weekends and holidays, when the global web consumption usually decreases. Higher values normally correspond to the publication of new posts.

Figure 4: Usage statistics
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The origin of the visits is diverse. They may come from direct access to the blog URL, referred from another website or coming as a result of a query to a search engine. The percentage of every source is represented in Figure 5. Despite the percentage of referring site is 43.85%, this value may be misleading, as they include the access to blog pages referred in the same blog. To be precise, the 38.49% of referred visits come from another article in the blog. The external references bringing visitors to the blog are the professor and department web pages.

![Traffic Sources Overview](image)

*Figure 5: Traffic Sources Overview*

The degree of internationalization of the initiative is proved in Figure 6, a map overlay of the geographical origin of visits. Most visitors (51.10%) are located in the same country as the university, but the blog has also been viewed from more than 111 countries from all continents. A significant amount of accesses are also due to mobility factors of the authors as during the represented period the professor visited a research laboratory in the United States (12.34%) and Belgium (3.00%) has received all the participating students in the mobility program. It is remarkable that India (3.50%) is in the third position of the ranking, a country with no relation with the authors team and that highlights the interest of the covered topics in this developing country.
In terms of topics, the most successful posts correspond to those subjects that have received most attention by the technological media during the year of study. As it can be seen in Table 2, these posts include in their title keywords related to the most recent hypes in the Internet, such as “iphone”, “web services”, “video streaming” or “twitter”. The last entry in the top ten corresponds to the retrieval of all articles from a single author through its dedicated label (“khristina”). The first position of the rank, noted as “/” corresponds to accesses to the blog main page.
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In terms of feedback on the blog, results are not very high. Only 27 comments were received, sometimes friends and acquaintances congratulating the authors for the work, others asking for further details and a few proposing new research directions. A couple of them were even spam, that is, automatically generated messages placed in the blog to increase the ranking of third-party websites in search engines. In these cases, the comments were manually deleted.

c.2) Educational contributions

The usage of the web blog as an additional tool for thesis supervision has had an impact in learning process of students during their thesis.

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Table 2: Most visited blog posts

<table>
<thead>
<tr>
<th>Page</th>
<th>Pageviews</th>
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<tbody>
<tr>
<td>/</td>
<td>5,036</td>
</tr>
<tr>
<td>/2010/03/iphone-http-streaming-encoder</td>
<td>310</td>
</tr>
<tr>
<td>/2009/05/video-playing-with-igmp.html</td>
<td>236</td>
</tr>
<tr>
<td>/2009/04/webservices-keywords.html</td>
<td>196</td>
</tr>
<tr>
<td>/2010/02/http-live-streaming.html</td>
<td>178</td>
</tr>
<tr>
<td>/2009/04/web-services-introduction-soap</td>
<td>171</td>
</tr>
<tr>
<td>/2010/03/crea-iptv-twitter-screen-shots.hr</td>
<td>152</td>
</tr>
<tr>
<td>/2009/03/thumbnails-extraction.html</td>
<td>151</td>
</tr>
<tr>
<td>/2010/01/steps-to-test-application-on-iph</td>
<td>130</td>
</tr>
<tr>
<td>/search/label/kristina</td>
<td>123</td>
</tr>
</tbody>
</table>
The most obvious contribution of the initiative is that students have practiced technical writing in English. In the case of all students that have participated in the experience, English is not a mother tongue but their third or fourth language. This is a transversal competence in most technical studies, as English has become the vehicle for knowledge transmission in our global world, very especially, in the technology field. All consulted students point English writing as one of the main challenges for contributing to the blog but, at the same time, they normally agree in the importance of such practice. Depending on their expertise, they will consider writing first on a word processor with spell checking activated before publishing their texts. In most of the professor's reviews, there are some observations related to English writing, indications that are in general considered and adopted in future contributions.

The exposure to other authors texts is also an new form of education, even if as a side-effect. Sharing a blog among a group of students instead of creating a blog for each of them facilitates the reading of other students work. This activity contributes in terms of content as they become familiar with other topics related to their studies. In addition, seeing the evolution of other classmate' thesis is also a strong incentive as they feel part of a social group and they do not want to become an outlier, especially if they see their own work delayed with respect to the others.

The gradual generation of multimedia material since the beginning of the thesis has also become a very rewarding feature of the activity. Students no longer wait until the final thesis writing or oral presentation to prepare graphical resources to express their achievements. As a result, every figure can be deeply discussed without the stress of a deadline, giving as a result higher quality material than when generated at the end. Moreover, this material may also become valuable for the professor in the development of other teaching and research tasks. Student generated screen shots or diagrams have also been included into course notes and project reports, improving the professor efficiency on these duties.

Similarly, posts about related work are also an excellent resource at the time of writing the formal state of the art chapter in the thesis document. These entries, written at the beginning of the thesis process, summarize the contribution of every referred work in the student's own words. At the time of the final collection and organization of related works, these summaries are usually
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enough to structure the chapter and categorize group third-party contributions. Even though a final look at the original paper is advisable, a first iteration based on the blog posts can enormously simplify the task.

Reading and writing on the blog has become a great method to improve the communication between student and professor. The discussions originated by the posted texts have become more effective than without them. Firstly, because students prepare their texts very carefully as they know that will be publicly available and they care a lot about not making public mistakes. Secondly, because the professor can rapidly prepare the meetings with the student by a quick reading on the last posts. Finally, because the blog posts become the common communication space where the concepts and ideas formulated can be discussed with little misunderstandings. The blog becomes a memorandum for the thesis tasks, keeping record of the agreed tasks and collecting the sequence of tasks and arguments to complete the thesis.

Finally, though, the most important contribution of the blog is a more methodical approach to the thesis, as every new step is reflected in a new blog post. In some moments, students or professors might focus too much in a specific aspect of their work, preventing them to keep the global view of their thesis. The gradual writing on the blog clearly defines the general argumentation of their thesis and this becomes both a reminder and a draft version of the final document. Some students have highlighted that a sequential reading of their posts helps them into organizing their ideas and understanding better their own work.

c.3) Conclusions

This paper has presented a technique to introduce a blog in a teaching methodology for thesis direction. A set of basic guidelines have been proposed according the the collected experience of more than a year, aimed at a proper management and quality assessment of the results. Topics suggestions have been given for every stage of a typical thesis in order to synchronize the authors contribution to the blog with the development of the thesis. Web statistics have shown
that published texts have an international audience originated at a diverse sources and that students do regularly participate in the activity. The main contributions of the methodology have been described, highlighting the improvement on communication skills and proposing the blog as a platform for deliberation and reflection.

The main drawback of this activity is that it can be perceived by students as an optional and additional assignment that takes time and resources to the traditional thesis development. This perception must be considered by the professor and addressed if necessary. If this is the case, the benefits of the methodology should be regularly pointed out, by referring to previous posts during discussions and by presenting the blog posts as drafts for the final thesis document.

On the other hand, the publication of technical documentation accessible to the world is a powerful motivator to students, who see an application of the skills acquired during their studies to gain social recognition. In many cases, they consider these contributions to the public web as fair and necessary, somehow an exchange for all the web resources published by others that they regularly consume both in their professional and personal activity.

In terms of future work, my opinion is that a similar scheme could be replicated in any professional group that wants to improve communication. One step further would be the introduction of a similar initiative among the Phd students and professors in a research group. This practice may boost the interaction and exchange of ideas between researchers for the best of the research group.

To sum up, web blogs offer an opportunity to improve communication between students and their thesis advisors, at the same time that increase the student motivation on their works thanks to the public and social nature of the tool.
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4. BIBLIOGRAPHICAL REFERENCES


