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Top

Reflective practice

The Use of Digital Storytelling for ESP in a Technical English Course for Aerospace Engineers

Ana Sevilla-Pavón*, Belén Serra-Cámara** and Ana Gimeno-Sanz***
CAMILLE Research Group, Department of Applied Linguistics, Universitat Politècnica de València (Spain)

*ansepa @ upv.es, **bserracamara @ gmail.com, ***agimeno @ upvnet.upv.es

Abstract

Digital Storytelling is a powerful pedagogical tool for both students and educators, which started to be used for teaching and learning purposes a few years ago, becoming more and more popular over time. The use of digital storytelling in non-specific language learning contexts has been widely explored, as shown in the literature. However, its use in technical-scientific contexts of English for Specific Purposes (ESP) has not been so widely studied. This paper explores a project of digital storytelling for ESP carried out at the Universitat Politècnica de València, in Spain. The methodology was divided into

several stages: completing a pre- and a post-survey, learning about digital storytelling by doing a WebQuest, making decisions about their digital stories (topic, plot, software and media), sharing their stories with their classmates through the PoliformaT LMS, watching their classmates' digital stories, using the forum to write their comments about their digital stories and their classmates', keeping a log and preparing and presenting their "making of" in front of the class, and assessing both their peers' digital stories and their oral presentations. The overall results were very positive, as students were highly satisfied with their progress in learning and developing different skills, these being mainly linguistic, research, writing, organisation, digital, presentation, interpersonal, problem-solving and critical-thinking skills.

Keywords: Digital storytelling, English for specific purposes, linguistic skills.

1. Introduction

Digital Storytelling (DS) is a very useful pedagogical tool which has been defined in many different ways. Generally speaking, it relates to a short form of digital film-making that allows everyday people to share aspects of their life story. It is based on "the idea of combining the art of telling stories with a variety of digital multimedia, such as images, audio, and video" (Robin, 2012). Therefore, DS could be considered as a blend of the oldest and most traditional form of communication and transmission of knowledge, that is, storytelling; and the newest and most important means of communication and of sharing information: different forms and types of multimedia digital devices. Storytelling has been and still is important to humanity because stories help us overcome the tensions between the past and the possible (Bruner, 2003) and make meaning out of experience (Bruner, 1996; Shank, 1990); while experiences, and the stories created to make sense of that experience, are key to learning (Shank, 1990; Zull, 2002). Other advantages of stories relate to the fact that they help build connections with the students' prior knowledge and improve memory (Shank, 1990), resulting in an easier and more enjoyable way to remember (Shank, 1990; Rex, Murnen, Hobbs & McEache, 2002) and to comprehend the content and the message transmitted by the story. Storytelling also helps people connect to others (Lowenthal, 2008) by disclosing personal information and relating to each other's common experiences (Lowenthal and Dunlap, 2010). According to Bruner (1996: 147) "we live in a sea of stories" but "we have our own difficulties grasping what it is like to swim in stories", and therefore we need a metaphysical support (Bruner, 1987). In the case of digital storytelling for educational purposes, that metaphysical helper would be the teacher, who acts as a facilitator, providing students with the information they need in order to reflect and develop their own ideas and perceptions about what creating a digital story involves. Even though digital storytelling has been used in education and specifically in languages teaching and learning for the past few years, its use in English for Specific Purposes (ESP) has not been so widely studied. This paper therefore aims to contribute towards filling that gap in the literature by exploring a project of digital storytelling for ESP carried out at the Universitat Politècnica de València (UPV), in Spain. The project was divided into the following stages: completing a pre- and a post-survey, learning about digital storytelling by doing a WebQuest, making decisions about the students' digital stories (topic, plot, software and media), sharing their stories with their classmates through the PoliformaT Learning Management System (LMS), watching their classmates' digital stories, using the forum to write their comments about their digital stories and their classmates', keeping a log and preparing and presenting their "making of" in front of the class, and assessing both the digital stories and the oral presentations. The overall results were very encouraging as the students reported that this approach had helped them develop different skills: i.e. linguistic, research, writing, organisation, digital, presentation, interpersonal, problem-solving and critical-thinking skills. Moreover, the difficulties encountered when completing the project were easily overcome.

2. Technical English for Aerospace Engineers

The following project, "Digital Storytelling for Aerospace Engineering", was one of the assignments of the subject called Technical English for Aerospace Engineering, taught during the 2nd Semester, from January to June 2012. This is an optional comprised of 6 ECTS credits taught at the Universitat Politècnica de València, Spain. The proficiency level of the 52 students who enrolled in this subject ranged from B1 or intermediate to B2 or upper-intermediate, according to the CEFRL (Council of Europe, 2001).

The main goal of the subject is to help the student become acquainted with the grammatical features (structure) and lexis (vocabulary) which are specific to technical English, with a special focus on Aerospace Engineering. The main theoretical contents are organised around two broad topics: the inside and the outside of a plane. In addition, the subject deals with administrative-commercial English applied to the field of aerospace engineering. The main skills to be developed are grammar and vocabulary; reading and listening comprehension; as well as writing and speaking. These skills are practised in an integrated way so as to help the students in the development of communication and learning strategies in the target language.

The work load is split into two main categories: 60 hours of in-class activities and 90 hours of autonomous homework. In-class activities include 20 hours of lectures; 6 hours of exercises and problem-solving; 30 hours of computer-assisted work; and 4 hours of group projects. As for autonomous homework, this includes 25 hours of preparation for class presentations or group activities and projects; 40 hours for all the other activities not covered by the previous 25 hours, such as exam revisions, researching and looking for information, complementary readings, and completing extra exercises; 10 hours of revision relating to the group activities, projects and class presentations; 15 hours of collaborative work in a Virtual Learning Environment (VLE) in which documents can be shared or edited simultaneously by different students and/or their teacher, and where communication can be synchronous or asynchronous.

Concerning assessment, it is formative and based on the information gathered by means of 4 different evaluation methods, each of which has 2 modalities: 2 oral exams (20% of the final grade), 2 written exams (40%), 2 academic assignments (25%), and 2 group projects (15%). This kind of formative assessment is flexible enough so as to allow the teachers to make decisions concerning the types of tasks the students have to undertake for each of the assessment methods. It was therefore agreed by the teachers delivering the subject that some of the tasks for each of the different assessment modalities could be combined. Consequently, the Digital Storytelling for ESP project was designed in such a way that assessment data would be gathered by means of a combination of inter-related activities. These involved a wide range of competences, skills and knowledge, which gave rise to the different stages in which the project was divided. These stages will be dealt with in the following section.

3. Stages of the Digital Storytelling for ESP project

This project was completed by the students in several stages: completing a pre- and post-survey, learning about digital storytelling by completing a WebQuest, making decisions about their digital stories (topic, plot, software and media), sharing their stories with their classmates through the University's Learning Management System (LMS) *–PoliformaT–,* watching their classmates' digital stories, using the forum to write their comments about their own digital stories as well as their classmates', keeping a log and preparing and presenting their description of "the making of" in front of the class, in addition to completing two assessment forms. The students were advised to follow the dates in which they were supposed to complete every stage, trying not to go too fast or too slowly. The different dates and deadlines were shown in the calendar accessible through the PoliformaT LMS. The following table shows all the stages and the time needed to complete each of them (table 1), and the way the students saw it in the calendar (figure 1):

Creating your own Digital Story about Aerospace Engineering: stages		
	Stages	**Dates**
1	Completing the pre-survey	30.03.2012
2	Learning about digital storytelling by completing a WebQuest	04.04.2012
3	Making decisions about their digital stories (topic, plot, software and media)	20.04.2012
4	Writing the script	25.04.2012
5	Making the videos	02.05.2012
6	Voice-over recordings	04.05.2012
7	Editing the video to synchronise voice, music and visuals	09.05.2012
8	Sharing their digital stories in *PoliformaT*	11.05.2012
9	Watching their classmates' digital stories	9 11.05.2012 (to 16.05.2012)
10	Filling in the assessment forms for the digital stories	10 11.05.2012 (to 16.05.2012)
11	Posting their comments about their digital stories and their classmates' in the forum and replying to the comments they received	11.05.2012 (to 16.05.2012)
12	Keeping a log and preparing their presentation of the "making of"	16.05.2012
13	Presenting the "making of" in front of the class	13 18.05.2012 (to 25.05.2012)
14	Filling in the assessment forms for the "making of" presentations	18.05.2012 (to 25.05.2012)
15	Completing the final survey	30.05.2012

Table 1. Stages for completing the Digital Storytelling for ESP project.
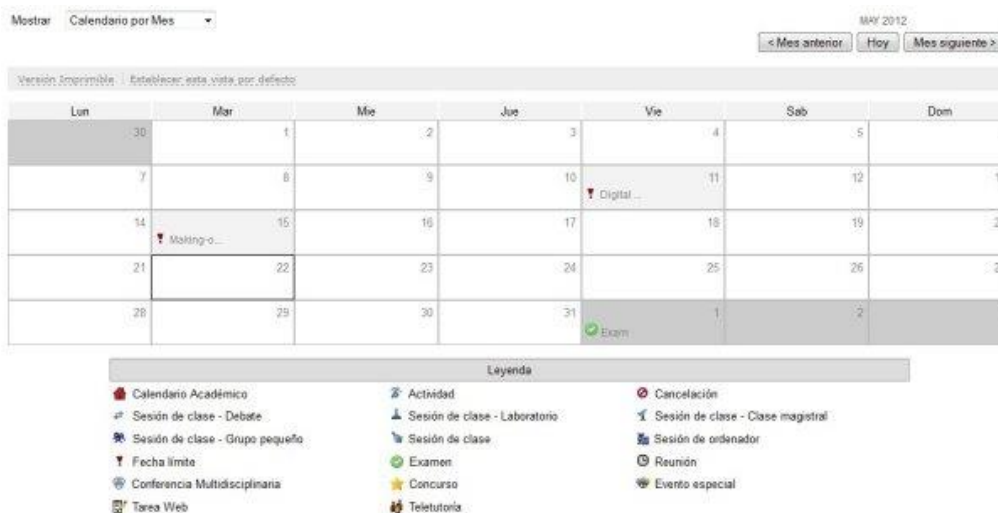

Figure 1. PoliformaT calendar for the tasks carried out in the Technical English subject.

One of the main goals of the initial and final stages, which involved the completion of a pre- and a post-survey, was to gather information about the students' perceptions of their learning and their self-assessment of the development of the skills and competences developed thanks to the project.

As for the second stage, the WebQuest, it was aimed at giving students an idea of what digital storytelling is, what it involves, the kinds of digital stories there are, as well as some examples; at the same time and because this was a group project, the students could start getting to know their partners and the way they worked. They worked autonomously and could select the sources from which to access the information requested. They were encouraged to access various different sources so as to get an idea of the huge variety of digital stories there are. They could also watch two video recordings recorded at the UPV studios, one giving an overview of digital storytelling and the other one explaining the project step by step.

Media 1. Introductory video about digital storytelling.
(Click on the image to watch the 9-minute sequence. It will open up in a new window.)

Having done this, they were told to acknowledge their sources, and they were also asked to write their initial impressions in their log. Since each group worked at their own pace, some of them finished their WebQuest earlier than others. Instead of having to wait until all the groups had finished, they were given the opportunity to move on to the next step, related to the preparation to the digital story itself: they were asked to start discussing, brainstorming and then making decisions about their digital stories, such as the topic, the plot, and the software and media they could use. They were also given class time to take a look at the different free tools available and, once they had done this, they could start looking for relevant visual and auditory elements to use in their story.

Then, the students started to write their scripts collaboratively, using text processing tools that allow for multiple editing, such as Googledocs. Alternatively, they could all sit at the same computer and tell one of the students what to write. Having done that, they uploaded their scripts onto their "shared folder" in PoliformaT so that the teachers could read each of the scripts and correct their mistakes, while giving them suggestions for improvement not only in terms of the language but also regarding the content, the need to narrate the story from a specific point of view and to provide some emotional content, and even to think carefully about how to present it.

The teachers decided that at this stage their feedback would be essential for several reasons. First of all, the correction aimed at avoiding the use of scripts containing mistakes which could be reinforced and memorised not only by the group members – who would be working intensively with the script, reading it several times to prepare their video, and then again for rehearsals and to record the voice-over–; but also by the

other students, who would be the recipients of the stories and therefore could be in danger of acquiring those mistakes once the written output in the form of a script was converted into oral input, this danger being enhanced by the power of multimodality in a digital story. Instead, it was thought that correcting any mistakes could contribute to language acquisition of grammar structures and lexis in context, due to that very same intensive exposure to their peers' input and output deriving from the script. The teachers did not correct every single mistake, but rather pointed out most of the mistakes and their nature, giving the scripts back to the students so that they could correct them themselves. The main difficulties encountered at this stage were: the fact that some weaker students did not write directly in English but decided to write their scripts in Spanish and then translate them into English, very often with the help of online translating tools that distorted the message; and the fact that some other students decided not to follow the schedule shown in the calendar and thus did not wait to get the corrections before recording their stories, with the consequent risks discussed above.

The next stages comprised making their videos; recording their voices; and then editing their videos to synchronise voice, music and visuals. The students were advised to build the story's visuals around the script and voice-overs, letting the script dictate which visuals they included. Moreover, they were given clear instructions about how to complete these steps successfully.

Figure 2. Click on the screenshot to watch the digital story called "Gliders".

Once they had finished doing this, they were asked to upload their stories onto PoliformaT. The main difficulty encountered at this stage, which had to do with the LMS's 400 MB limit per upload, was easily overcome by using free tools for file-sharing, such as Dropbox. This meant that this stage had to be redefined: instead of uploading their stories onto PoliformaT, the students uploaded them elsewhere and then shared the link to their stories (which could be watched online without the need to download them) in the forum in PoliformaT.

Following that, they had to watch their classmates' stories, fill in the assessment forms that their teachers had previously made available on the LMS, and post their comments in the forum. Additionally, they had to reply to their classmates' comments or questions. In order to prevent some stories being left with no comments, the students were asked to comment and assess at least 4 stories, and a priority order was established in such a way that they had to comment on the stories with fewer or no comments first, instead of leaving their comments for stories that had been previously commented by many other students. At this stage it was noted that, overall, the comments were quite thorough and objective, since most of the students made remarks on both the things they liked and disliked about each story, explaining why and giving their advice about how the stories could be improved.
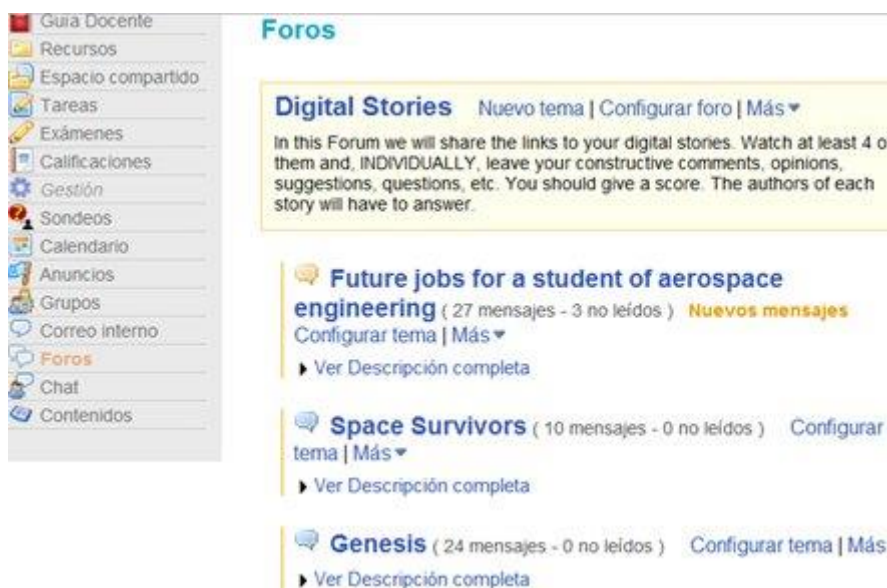
Figure 3. Screenshot of the *PoliformaT* forum of the digital storytelling project.

The stages that follow were interconnected, but there was a difference between both. The one about keeping a log was present throughout the whole process, whereas the preparation of the making-of presentation could obviously only be done once the story was finished. The parts of the log were: a day-by-day report of the group activities and meetings; a report of the individual contributions made by each of the group members every day (including the dates); a glossary in which the students had to write the new words and expressions they learnt, and their definitions; a description of the steps followed when creating their story, the media used and why, the software used and why, the difficulties encountered and how they solved them; and additional materials documenting the whole process (e.g. photos, voice-over recordings, making-of videos, bloopers and outtakes, etc.).
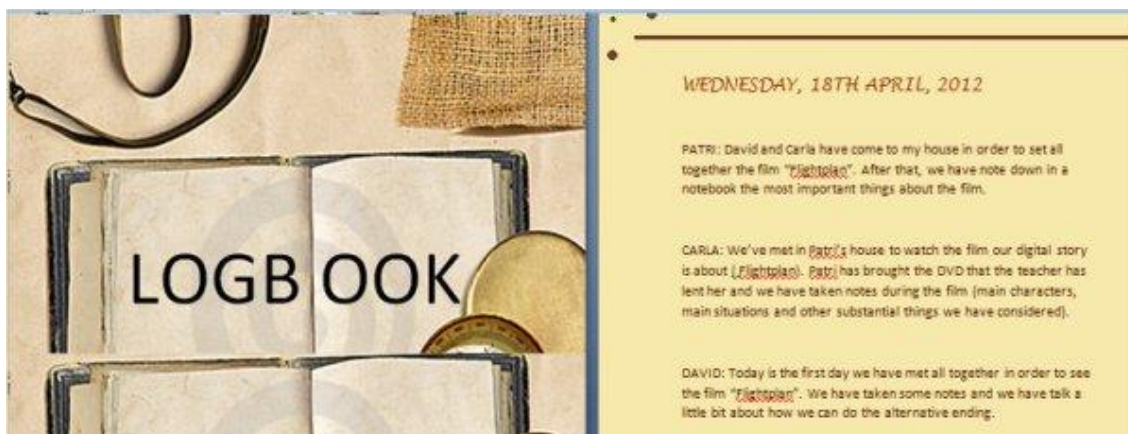

Figure 4. Screenshot of the log of the story "Flightplan: An alternative ending".

As for the making-of presentation, it relates to the oral explanation of the whole process of completing the project and creating the digital stories, based on the students' experience as reflected in their logs. Oral presentations were practiced at the beginning of the term, and the students were given advice and information about them –regarding such things as voice, control of space and time, body language, the importance of using their own words instead of reading, etc. In spite of this, most of the students found this activity challenging and felt anxious about presenting, but managed to overcome their anxiety.

We had some difficulties with the format of the videos we had recorded because their format was .3gp and our software only accepted .avi and .mpeg formats, so we had to change the format of the video with an open source program called Format Factory.

- Pictures.

Figure 5. Screenshot of the making-of video of the story "Gliders". Click on icon ⬛ to download PowerPoint presentation for viewing.

After the oral presentations, the students were again asked to be active agents of the assessment process, as they had to complete the assessment forms for the oral presentations. The aspects they were advised to bear in mind were the following: structure and organization, time management, originality, clarity, pronunciation, linguistic skills and overall level of English, oral and communication skills, references to the log and creative process. Once they had completed these forms, they had to upload them individually onto their "shared folder" in PoliformaT.

The last stage in the Creating your own Digital Story about Aerospace Engineering project was to fill in the final survey, created in Googledocs and embedded in PoliformaT. The survey was split into two parts. In the first part, the students had to choose the best piece of work in each of the pre-established categories: best digital story, script, music, images, special effects, voice dubbing, oral presentation and emotional content. The groups of students who were the most voted in each category got a certificate acknowledging their hard work and achievement. As for the second part of the survey, it related to their personal experience and opinion about the project, and the students had to assess different aspects such as motivation and the development of different linguistic and non-linguistic skills, both generic and specific.

4. Skills and competences developed

The skills aimed to be developed as a result of the different activities carried out within the project were mainly the following: linguistic, research, writing, organisation, digital, presentation, interpersonal, collaboration, problem-solving and critical-thinking skills. Table 2 shows a description of the different activities and the skills that are developed when carrying them out. Although the completion of each of the activities usually requires a combination of different skills, for the sake of clarity the following table shows the main skill or set of skills promoted in each of the activities:

Activities and description	Skills
All the activities: reading, writing, speaking, listening, vocabulary and grammar.	*Overall linguistic skills*
WebQuest: Getting their own ideas and perceptions about what digital storytelling is, what it involves, the different types, etc. "Making of": Reflecting about the learning gains and about the outcomes of the project. Surveys: Reflecting about different concepts and activities related to DS. DS: making decisions about their digital stories in terms of topic, plot, script, software and media to be used.	*Reflective skills*
WebQuest: documenting the story; finding and analysing pertinent information.	*Research skills*
DS: formulating a point of view and developing a script. Webquest: writing their answers to the different open-ended questions.	*Writing skills*
Calendar and log: managing the scope of the project, the materials used and the time it takes to complete the tasks.	*Organization skills*
DS and "making of": learning to use a variety of tools, like digital cameras, microphones and multimedia authoring software for audio and video recording and editing; learning to critically assess and choose the tools needed to complete every stage of the project.	*Technology/digital skills*
DS and "making of": Deciding how to best present the story to an audience.	*Presentation skills*
DS: Working collaboratively within a group and determining individual roles for group members. Forum: Sharing their stories in the forum, writing their comments, reading their classmates' comments, replying to them. Webquest: working collaboratively towards a final group outcome by transforming newly acquired information into a more sophisticated understanding.	*Interpersonal and collaboration skills*
All the activities: learning to make decisions and overcome obstacles at all stages of the project, from inception to completion.	*Problem-solving skills*
Evaluation rubrics for digital stories and making-of presentation, log: gaining expertise critiquing their own and others' work. WebQuest: finding and analysing pertinent information.	*Assessment and critical-thinking skills*
Making-of presentation: learning how to present their work in front of the class.	*Public speaking skills*

Table 2. Skills developed by each of the activities within the Digital Storytelling for ESP project.

A myriad of linguistic skills were developed and practiced in each of the stages and activities of the project. Among those, it is important to highlight the basic linguistic skills developed when learning a new language: reading, writing, listening, speaking, lexis and grammar. Reading and writing were mainly practiced in the WebQuest, scripting, voice-over recording and synchronization, writing the log, preparing and presenting the "making of", using the forum, and filling in the assessment forms. As for

the listening and speaking skills, they were developed in activities such as working collaboratively in groups using English as the communication language, recording their digital story, watching the video recordings about the project, watching their classmates' digital stories, watching other examples of digital stories and delivering their making-of presentations.

An important goal of this project was to make students think critically and self-assess their learning, raising their awareness about the skills and competences to be developed while making them reflect on the way they are developing them and on how useful the different tools used are when trying to develop each of those competences (Sevilla-Pavón et al., 2011). In June 2012, the 52 students filled in a final survey to assess the degree of usefulness of this project for the development of different skills. In this survey, the development of their overall speaking skills obtained 4.82 points; pronunciation obtained 5.52 points; the listening skills got 5.41; reading got 4.82 points; writing got 5.06 points; and grammar and vocabulary got 5.71 points. These results are shown in table 3. These results correspond to a 7-point Likert scale showing the students' opinions concerning the degree of usefulness of the Digital Storytelling for ESP project as far as the development of the different linguistic skills is concerned.
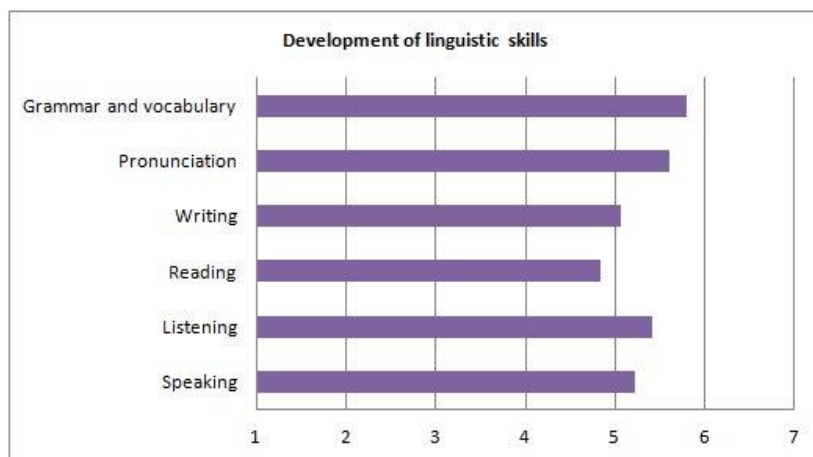

Table 3. Degree of usefulness of digital storytelling for the development of different linguistic skills.

As for the students' written opinions expressed in the open-ended questions, when the students were asked to complete the following statement "Concerning English learning, this activity can be considered as…", different students wrote: "really good" (student A), "I think that I have learnt more English with this project compared to the rest of the class activities" (student B), "very good, because you have to read (looking for information for the script), write (the script, logbook, making of...) and speak (the presentation), so I think it is a very complete activity" (student C), "very good, a great way of learning a language" (student D)".

5. Conclusion

This paper has aimed to contribute toward exploring the possibilities of using Digital Storytelling as a very useful and engaging teaching approach for foreign language learning within a technical university setting. The Digital Storytelling for ESP project, which took place in the second semester of 2012 and was completed by 52 aerospace engineering students enrolled in a subject called technical English, involved the completion of different tasks, split into several stages: completing a pre- and a post-survey; learning about digital storytelling by completing a WebQuest; making decisions about their digital stories (topic, plot, software and media, etc.); sharing their stories with their classmates through the PoliformaT LMS; watching their classmates' digital stories and assessing them, using the forum to write their comments about their digital

stories and their classmates'; keeping a log and preparing and delivering their making-of presentations in front of the class; and assessing the presentation.

The overall results were very positive, as the difficulties encountered were easily overcome. The students' level of satisfaction was expressed in their open-ended answers to different questions concerning the project, as well as in a 7-point Likert scale in which all the values were above 4, showing that the students were satisfied about their learning and the development of different linguistic and non-linguistic skills, both general and specific.

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Appendix

Assessment Rubric for Digital Stories

1. Use this rubric in order to assess your classmates' digital stories. Write your constructive comments and questions INDIVIDUALLY in the forum after watching every digital story (you should watch and assess at least four of them). Make sure you address all of the points below.

2. Fill in this form INDIVIDUALLY about each of the stories you have watched (at least, four). You should give a score to each of the following points for each story (from 1 to 10). You can add new points if you like. Upload this document onto PoliformaT.

3. In the forum, read the comments and questions your classmates have written about your story, and reply to those comments and questions. Only one member of the group needs to reply to every comment.

Title:	Score (1-10)
Interest of the topic	
Depth of research	
Originality	
Communicative skills	
Pace (not too fast, not too slow)	
Use of resources	
Variety of resources	
Linguistic skills and level of English	
Pronunciation	
Structure	
Emotional interest	
Synchronisation of narration and resources	

EVALUATING YOUR CLASSMATES: 9-10= Outstanding / 6-8= Satisfactory / 4-5= Needs improvement / 1-3= Very poor

Top