DIGITAL STORYTELLING FOR INCLUSIVE EDUCATION: AN EXPERIENCE IN INITIAL TEACHER TRAINING

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ABSTRACT

We present an experience of digital storytelling conducted as part of a course for initial teacher training. The students of a special education course produced a digital story as partial fulfillment of their distance learning assignment. We describe the structure of the work completed by the students and discuss the results of a questionnaire they filled out after the course, which aimed to gather their opinions about the experience. The experience was agreeable to the students, with many stating that they are likely to repeat the process in their school, either by developing stories themselves or by engaging their future pupils as designers and developers.

KEYWORDS

Digital storytelling, multimedia communication, initial teaching training, inclusion, digital competence, Universal Design for Learning

1. INTRODUCTION

The pedagogical value of storytelling is widely documented in the literature. Bettelheim (1976) suggests that classic narration of fairy tales, in addition to being entertaining, enriches children's lives, stimulates their imagination and helps them clarify their emotions, recognize their difficulties and find solutions to the problems that trouble them. Bruner (1986) highlights the cognitive, social and emotional value of storytelling for children by asserting that stories are elective tools that foster language development and build and enrich vocabulary and knowledge about the world, in accordance with the active forms of learning (Fontichiaro, 2007).

The importance of storytelling is not limited to early childhood, but crosses age barriers and reverberates across multiple fields of knowledge, from literature to philosophy and from the social sciences to physics (Nash, 1990) and mathematics (Schiro, 2004).

The growth and diffusion of digital media tools in recent years has favored the birth and popularity of digital storytelling (DST), a new kind of narrative immediately perceived as a suitable method for ensuring the interest and motivation of teachers and students (Hung et al., 2012; Robin, 2006, 2008; Sadik, 2008; Yuksel et al., 2011), for promoting narrative skills in children (Cassell and Ryokai, 2001), for encouraging positive attitudes towards working in groups (Di Blas et al., 2012) and for enhancing the experience of learning a foreign language (Casta, 2013; Nguyen et al., 2014).

Two areas for DST application that quickly attracted the attention of researchers were those of teacher education (Coutinho, 2010; Heo, 2011; Skouge and Rao, 2009; Tendero, 2006) and education of pupils with special needs (Botturi et al., 2014; Michalski et al., 2005).

Our research stands at the intersection of those two domains, offering a way to apply and discuss methods for communicating with pupils with special educational needs within a special education course offered to the students of an initial secondary school teacher training degree.

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2. THE EXPERIENCE

The experience presented here took place during an initial teacher training course held at the University of Bergamo (Italy) in 2015.

It should be noted that in Italy, in order to be admitted to the public recruitment competition for secondary school teachers, after a 3+2 university career one has to complete a pre-service teaching training course (TFA) managed by a university under the supervision of the regional school office. Given that most students are already temporary substitute teachers in schools, the courses are provided in the afternoons and on weekends. This means that the same people who are students in the evening, have their own pupils in the morning.

Two groups of TFA students were exposed to our experimentation: one group of prospective teachers of literature, and one group of prospective teachers of mechanics and technical drawing.

Each of the students had to take part in a special education module comprising 30 hours of classroom teaching and 36 hours of distance learning. As partial fulfillment of the latter requirement, the students were requested to create a short sample (five minutes) of digital storytelling, to be developed by weaving together text, images, music, audio narration and possibly video. Given that the students had no experience of DST and were unfamiliar with the multimedia tools to be used, they were instructed both through short demonstrations during class time, and through documentation and examples uploaded to the e-learning platform.

The initiative had several direct and indirect educational purposes:

1) implementing a form of engaging e-learning for students who spend their mornings at work, their afternoons attending courses and their evenings studying and completing (often boring) e-learning tasks;

2) promoting digital storytelling and media composition skills suitable for TFA students to use in schools to communicate with their current or future pupils;

3) raising awareness of opportunities for involving secondary school pupils in developing original digital stories; and

4) encouraging reflective experimentation of a design methodology inspired by Universal Design for Learning (Rose and Meyer, 2002), in keeping with the content of the special education course.

The experiment was anchored to the field of research that has led to the development of the multimedia learning theory (Mayer, 2005), but also considered evidence that media production activities carried out by students are often heavily time consuming and generate ineffective products, and that the same can be said of the development of multimedia artifacts by teachers, shifting (perhaps) the emphasis from effectiveness to efficiency.

The task that was proposed to the participants was highly structured (inspired by the Coursera MOOC *Powerful Tools for Teaching and Learning: DST*, held by Bernard Robin and Sara McNeil of the University of Houston), so that between the lessons (spaced 7–10 days apart) each student had to engage in a production- and/or evaluation-phase, according to the following scheme:

Step 1: Choice of subject and purpose: the fundamental elements of DST and the essential features of a good story were introduced; the students chose a topic and defined the educational goal for their story which was to be created in the following weeks. Everyone published a summary of their storyboard on the e-learning platform, including (1) title; (2) target audience; (3) aim/strong educational idea; (4) possible use of the story in a formal, non-formal or informal educational setting; and (5) main idea to be retained by the audience.

Step 2: Setup of an effective script and creation of a storyboard: the focus was shifted to the draft of the script (screenplay), and steps for developing an effective plot were highlighted. Issues of picture selection, including size, type, quality and ownership, and the best way to create a storyboard were also addressed. The weekly task for this stage was twofold, with each student:

(1) evaluating the stories of (at least) three colleagues by posting on the forum a judgment, which consisted of a score (ranging from 0 – 3) based on six features of the story (known from the beginning of the project) and qualitative written feedback; and

(2) sketching the draft of their script, identifying the images to be used creating a storyboard with text and images and publishing this on the e-platform.

Step 3: Recording: the students learned how to use digital devices to record and edit an audio narration to be coordinated with the pictures they had chosen for their final story. The weekly task

consisted of recording the audio (without publication) and evaluating the screenplays of three colleagues. The students were free to use the audio editing program of their choice; however they were shown how to use the free software, Audacity.

Step 4: Integration of multiple digital sources in a DST environment: the students were shown how to merge text, images, audio and video within a multimedia editing program. The weekly task required students to create the final movie, upload it to the Internet and share its web address on the forum. The students were free to use their favorite editing and publishing program; however they were shown how to use the free online video editing service, WeVideo, which allows both the creation and publication of digital stories (see, as examples of the final products, bit.ly/esever, bit.ly/esececi).

Step 5: Final evaluation: each student had to evaluate three movies, using rubrics similar to those in the previous steps.

After the completion of the course, we started to reflect on the experience to assess positive and negative aspects and possible implications. For reasons related to the number of course participants and to the composition of the groups, the analysis focused on students within the literary department, with a total of 41 people (F = 31, M = 10; age $\mu = 29.5$, $\sigma = 4.7$). They were asked to fill in an online questionnaire regarding their experience of DST. The questionnaire was completed by 25 subjects (response rate 61%) and consisted of 23 questions:

- Five of the questions requested an estimate of the time required (in hours) for each step of the program (e.g., How long did it take to complete Task 1, which was idea generation, identification of target audience, goal setting and preparation of the descriptive card?);
- Five of the questions asked how substantial they perceived each of the phases (conception, scripting, audio recording, video editing, and assessment) to be (using a five-point Likert scale; e.g., On a scale from *really light* to *really heavy*, how would you rate the audio recording phase?;
- Six of the questions were designed to assess students' satisfaction with the initiative and any intention to reproduce it in their school (using a five-point Likert scale, from -2 to +2; e.g., To what extent do you agree with the following sentence: 'I have acquired skills that I will use at school'?; 'For a teacher the use of DST may prove effective in communicating with pupils'; 'I think it will happen to me to ask my pupils to develop DST products');
- Seven of the questions focused on the skills of the respondents, as perceived by them (using a five-point Likert scale from -2 to +2; e.g., If at this moment I were asked to generate in Word (or Writer or similar) the table of contents of a document, I would know how to do it).

A provided space for comments was used by 10 subjects.

The questionnaire was anonymous and confidential, with a clause allowing the use of data in aggregate form for research and teaching purposes. It was decided not to include requests for personal information (sex, age and years of education) since the questionnaire had a small study sample and personal questions could have instilled suspicion of being tracked.

3. RESULTS AND DISCUSSION

Students' achievements and performances exceeded teacher expectations. The final evaluations of the stories produced by the students, based on the same quality model and the same rubrics proposed to them for their mutual evaluations, showed the experience to be more than satisfactory, as the average final score was 8.6 out of 10 ($\sigma = 1.5$). Moreover, final informal meetings following the conclusion of the course verified that the experience had fostered meaningful learning. For these reasons, we decided to activate the survey in order to collect the students' opinions, which are briefly summarized here.

The students' overall satisfaction with the type of assignment was rather high ($\mu = 1.30$, $\sigma = 0.97$), as were beliefs that they had acquired valuable skills ($\mu = 1.30$, $\sigma = 0.76$); these two opinions were fairly correlated ($\rho = 0.47$), whereas the correlation between satisfaction and initial expectations was much lower ($\rho = -0.23$). No influence of perceived expertise was detected (items with Cronbach alpha = 0.6).

The comments collected through the text field confirmed the numerical data: the experience was defined as "*exciting*", "*very useful, inspiring*", "*tough but really educational*", "*creative, and to be proposed to my pupils*", "*positive and constructive*", and as an activity that "*intrigued, amused, stimulated and fascinated*" and provided "*final gratification once the work was finished*". Two-thirds of the group said they were likely

to use DST as a tool for their own classes ($\mu = 0.96$, $\sigma = 0.93$) and the same percentage plan to let their students use it ($\mu = 0.83$, $\sigma = 0.89$).

We cannot hide that the sample choice, made up of people presumably familiar with storytelling, may have introduced a significant bias; however, the opposite is also true, since they were not particularly skilled with computer programs and thus plausibly wary of educational technology. On the other hand, we attained similar results and agreement from the students excluded from the questionnaire, whose backgrounds were symmetric to those of the students being investigated.

With reference to the efficiency of the experience, the data collected regarding the time required to complete the different tasks yielded an average of 18.5 hours ($\sigma = 8.2$), which took into account the design and development phases only, and not the evaluations. This seems to be rather high, considering that the final product only runs for about five minutes (those who used tools other than WeVideo delivered longer stories), but one should take into account that almost all of the students devoted a great deal of time to learning new tools (as well as looking for pictures). Moreover, the anxiety factor for the exam certainly multiplied the number of checks and revisions performed by the novice DST authors and expanded the required times. All in all, it can be assumed that a large number of the students might eventually develop products more efficiently in the future.

4. CONCLUSIONS

We have presented an experience of using digital storytelling as a tool for effective teaching and meaningful learning. It was used during pre-service training for prospective secondary school teachers within the e-learning program of a special education course.

Despite the students' limited initial competences in DST, their final achievements satisfied the lecturer, and the students appreciated the initiative and expressed intentions to replicate it with their own pupils.

As far as future research into this area is concerned we are going to use a quality model, which takes into account multimedia communication principles, to compare the final digital storytelling products of these students with those of another group of students, who have developed PowerPoint slides for PechaKucha-style examinations. This will enable us to understand which modality is more effective and suitable for unleashing students' creativity and communication skills.

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