DIGITAL PEDAGOGIES FOR TEACHERS' CPD

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ABSTRACT

The continuous professional development of educators is not only essential to highly maintain their expertise levels and ensure that their knowledge is up to scratch, but also to catch up and adopt new pedagogical tools, skills and techniques. The advent of the Web 2.0 brought about a plethora of digital tools that teachers have not only struggled to keep track of and investigate the array of tools available, but also have been at a loss of how to productively employ and take advantage of the benefits each of the different tools has to offer. In this paper we present a number of such tools as part of an empirical study to investigate the use of freely available digital tools. This exercise was a spin-off of a project that aims to embrace literacy through digital media as it focuses on re-training educators in the use of digitally supported methods that employ innovative teaching methods. In our conclusions we draw important guidelines on how to optimize the use of such continuous emerging web tools, as well as future work and new potential research directions.

KEYWORDS

Digital Pedagogies, Teachers CPD, Web 2.0, Web Tools

1. INTRODUCTION

The use of innovative teaching methods forms an essential part of the continuous professional development (CPD) of teachers especially when one considers the ever-growing challenges and opportunities that become available online. Educators require new skills to adapt to the dynamic nature of digital tools and pedagogies that offer novel and potentially more effective methodologies. This is even more amplified by the emergence of Web 2.0 (O'Reilly, 2005) technologies that changed the way web pages and applications are designed and used. According to Davies and Merchant (2009) Web 2.0 is a generation upgrade on the previous static World-Wide Web (WWW), where these new dynamic technologies endorse and propagate learner generated material together with mechanisms that encourage and support even more interaction between the web users. To such extent the authors claim that Web 2.0 technologies have the potential to enrich and transform the entire education process and experience as they point out four distinctive characteristics of how learners, through Web 2.0 technologies, have the potential to be actively present themselves instead of being passive receivers. Learners are also able to modify content itself as well as generate new material that can be appended to the content, and at the same time participate in the social activities that such technologies enable. These communal practices that Web 2.0 support, empower the learner (Bousaaid, et al., 2015) to actively collaborate, further share, and communicate freely with other learners. Such networking capabilities as part of each learner's personal learning environment (Sclater, 2008) have also characterised Web 2.0 technologies as they have promoted the development and use of a variety of networking tools (O'Reilly, 2005; Sclater, 2008) that further support and foster an academic eco-system that learners themselves create and generate through online social activities.

An Erasmus+ project called Breaking Barriers (2007) under the current European Framework Programme aimed to take full advantage of such technologies where amongst other objectives it aimed to tackle adult literacy by training educators in the use of innovative pedagogies. The project that involved the collaboration of eight European further education centres aimed to bring together adult education and digital media by exploring how to tackle low-skilled literate adults by engaging them and motivating them through the use of digital tools. As the different partners tackled the distinctive difficulties encountered within their own country they found a common objective of introducing cutting-edge technologies and tools to tackle such literacy challenges across cultures by ensuring their educators were not only aware but fluent in the use of the latest web technologies that inspired and facilitated their work. As a spin-off from the project we investigated the

capacity building and the professional development of adult educators who participated within the project as they were exposed to these new technologies to enhance their digital competence in the teaching of basic literacy skills to adult learners.

The rest of the paper is organized as follows. The next section will delve into the benefits of Web 2.0 technologies as a number of tools that are later employed as part of the empirical study are highlighted and documented. Section 3 will be all about the empirical study itself as the project objectives are revisited, the array of tools identified, and the details of the study itself are specified. The following section presents all the results collected together with a thorough discussion to evaluate such results, before closing this paper with our conclusions and future work.

2. WEB 2.0 BENEFITS

The WWW evolved over time from a static document repository where users could access documents through their web browsers in a read-only fashion to a read-write environment with dynamic content and possibilities for users to contribute, author and participate. This change to the second generation was not as simple as it seems as numerous other factors played an important role. The web browsers themselves went through a drastic operational evolution to support such a functionality as a struggle between a number of browsers was going on to acclaim absolute control of the web users as increase their revenue. On the other hand, the World-Wide Web Consortium (W3C) were also working hard to ensure that the required standards and protocols are in place. Other technologies that played an important role in the evolution of Web 2.0 was the Semantic Web itself together with the support of the eXtensible Markup Language (XML) that was also striving to destabilize its application and effectiveness. Berners-Lee et al. (2001) set out to define how the new web generation had meaning and thereby set the trend to develop higher-level applications (Hendler, et al., 2002) that could exploit the enhanced capabilities of a smarter web (Frauenfelder, 2001).

From an educational point of view Web 2.0 technologies and applications have enabled a novel medium which teachers and students alike can benefit from as such technologies have “blurred the line between producers and consumers of content and has shifted attention from access to information toward access to other people” (Brown & Adler, 2008, p. 18). In this way Web 2.0 empowers educators and learners to communicate and interact in new and natural ways that was not previously possible over the web thereby creating a new educational medium that teachers have to rethink and eventually require re-training. The reason behind such reasoning as this novel medium moved the goalposts from students that are receptive to a more interactive and creative. Educators are required to push the boundaries on their students to motivate them to share, comment, post, create, produce, edit and assess other students’ work and contributions. This also helps students gain confidence in themselves as they adopt critical thinking skills as well as useful social skills as they interact with peers, educators, knowledge providers and other web users that will assist them during the education process and life in general.

From a practical point of view in reality learners are already making extensive use of Web 2.0 applications in their life outside the educational arena, so employing tools which they are already accustomed to and which they are happy to use is an added advantage to the educational process that facilitates the educator’s life. The challenge here is for the educator to select the most suitable Web 2.0 tool to employ that appropriately fits with the pedagogy being adopted. Penney (2012) depicts a number of Web 2.0 tools within Bloom’s taxonomy to assist educators in their quest to employ the right tool for the right job. Figure 1 shows an adaptation of this image with tools that have been employed during the empirical study itself. The same idea of looking at the available tools through the perspective of Bloom’s taxonomy brings out the point that some tools are applicable to more than one domain and so they can move up and down the taxonomy as need to be employed by the educator as long as the tools serves to achieve the intended outcomes as planned within the respective learning objectives. Some of these tools as mentioned earlier could already be successfully employed by students like for example using Skype, Viber or WhatsApp to communicate amongst themselves, Instagram, Diigo, Imgur and Scoop to bookmark and share interesting stuff online, Padlet, Prezi and Slideshare to distribute presentations, or Quia, SurveyMonkey and Doodle to set polls and appointments. The educator is required to make use of these same tools but for educational goals in a way that promotes collaboration amongst learners to achieve a common goal or to generate an engaging learning task that requires group work.

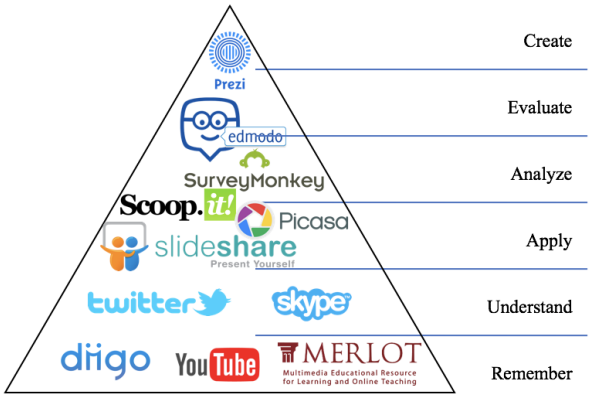

Figure 1. Adaptation of Digital Bloom's (Penney, 2012)

3. EMPIRICAL STUDY

The purpose of this was to investigate the use of digital pedagogies through the use of Web 2.0 tools during a CPD course for adult educators to address the main objective of the Breaking Barriers project, namely to address adult illiteracy. Participants were required to research a randomly assigned tool from the list provided in Table 1 and to complete a given task by using the same tool. The research questions that guided this empirical study were:

i. What is the purpose of employing digital pedagogies?
ii. What benefits / challenges of employing digital pedagogies?
iii. How best to employ digital pedagogies in education?

A group of a hundred adult educators were asked to participate in an online survey out of which a convenient sample of 80 participants was formed. They were asked to access and complete an anonymous online form in March 2017. The form randomly selected a Web 2.0 tool and each participant was asked to thoroughly investigate the particular tool and then answer a series of five questions, namely:

a. What is the purpose of this particular tool?
b. How can it be fruitfully applied in class?
c. Describe how it can be used as part of a pedagogy to teach adult literacy
d. Identify any challenges encountered
e. List any recommendations or tips to employ this tool

4. RESULTS

All the data submitted by the participants was automatically saved within a spreadsheet which was then analyzed to develop a grounded theory by employing the constant comparative method (Strauss & Corbin, 1990). The authors suggest that this method is suitable to create a theory of how the social world works when applied to social units of any size as it connected to that reality that it has been employed to explain. The data collected was meticulously coded within the thematic content analysis software called NVivo (2017), that is a dedicated software application which performs qualitative data analysis, especially for unstructured and non-numeric data. Thematic analysis traditionally involves six sequential and incremental steps (Braun & Clarke, 2006), starting with a familiarization of the collected data and generating initial codes, followed by a search for themes, reviewing of the themes, defining and naming the themes, and finally employing the constant comparative method to generate a theory.

Following the data entry process of the collected responses within NVivo, three thematic containers or nodes reflecting the three research questions that guided this research, and influenced the accumulation of the responses around the questions within the online form, namely: Purpose of Web 2.0 tools, Benefits / Advantages vs Disadvantages / Challenges, and Recommendations.

As expected an array of mixed results were reported on the purpose of the different tools as they all serve a different purpose with the exception of a couple of tools that perform the same task. However it was interesting to notice small clusters in the terminology used by the participants to describe the purpose. These

clusters can easily be traced to the different levels of the Bloom's taxonomy in Figure 1. For example a number of tools are used to collaborate or moderate which can easily be associated with the higher order thinking skills of creating where participants used words like constructing, making, and producing to describe the purpose of the tools they investigated. Similarly tools employed to debate and comment can be associated with the evaluation layer whereby participants used words like critique, judge and check to describe the purpose of their tool. Another example can found in the understanding layer where tools are normally employed to network, contribute and chat, while participants used words like compare, interpret and explain to describe the purpose of these tools. This goes out to show that at some level the different digital tools under investigation fall under broad categories that can be traced back to the six layers of a person's thinking skills and that each tool addresses that specific skill at some level. The analyses layer was also noticed to have been characterized by words like compare, outline and find that were used by participants to describe the purpose of tools that require skills to review and question. The application layer that typically involves tools that require skills to reply, post and blog were described by participant with words like implement, use and execute. Finally, tools employed to text, message and tweet, associated with the lower order of a person's thinking skills, the remembering layer, were described by the participants with words like name, find, and recognize.

Table 1. Web 2.0 Tools Employed During the Digital Pedagogies Empirical Study

Facebook to reach out to students at a level medium;
Twitter to tweet educational related material;
WhatsApp to communicate with other right away;
Google hangouts to set group meetings;
Skype to communicate in real time;
Viber to communicate synchronously;
Instagram to bookmark interesting stuff to share;
Second Life to simulate virtual environments that can serve educational purposes;
Diigo to save, organise & annotate online sites that are considered interesting, useful & important;
Pinterest to share interesting photos;
Weebly blog to post your thoughts and opinions for others to follow;
Wikispaces wiki to store information and educational resources;
Scoop to be able to reuse content from other interesting sites;
Flashmeeting to be able to set realtime meetings with numerous people concurrently
Merlot to access ready-made educational resources;
Prezi to author some dynamic presentations;
Slideshare to be able to share all your presentations;
Quia to be able to set online polls;
SurveyMonkey to develop online surveys;
Moodle to host your lessons;
Piratepad to collaborate online writing pad;
Padlet as a common whiteboard over the web;
Mindmeister interface for a group to collaborate creatively using mind maps;
Vocaroo to voice recording;
Screencast-o-matic to record a screencast;
Edmodo environment to get students connected within a digital classroom;
Imgur to save, use, reuse and share photos;
Powtoon to create animated videos and presentations;
Hipchat to hold meetings that include group chat, video chat & screen sharing;
Coursera MOOC to register for a MOOC;
Youtube to upload all your videos you want to share with students;

The results for the second node were much more coherent as participants homed on the pros and cons of such tools irrespective of which specific tools they investigated. What emerged was the fact that, similar to any teaching aid, is these tools are employed effectively they lead to higher levels of communication and collaboration amongst the learners. On the other hand the participants pointed out that such tools, beneficial as they might be, do not serve all types of purposes and that an educator needs to skillfully judge precisely which tool to employ for a specific pedagogy. Creativity was one of the frequently used descriptors when participants highlighted the benefits, while frustration and steep learning curve were predominantly used to highlight the challenges that such digital tools can create. Another term that was frequently used to describe the benefits of such digital tools was the freedom and flexibility that they offer, however this same term was used by some other participants to describe a disadvantage. They argued that some learners are threatened by

such openness and lack of direction or guidance. What emerges from the analyses of this node is the fact that caution needs to be applied when employing such tools to ensure that the learners are at the right cognitive level of the tool itself in a way that they can easily master it and fruitfully benefit from it without any major effort.

The third node produced much more open-ended results as participants proposed a plethora of recommendations, however it was clear that once participants were reluctant to make use of a tool that performed a similar functionality to a tool they had already mastered. Their recommendation highlighted the fact that an educator must employ a tool that s/he has already mastered her/himself, and rather than making use of a new unknown tool for the sake of novelty the educator should stick to what s/he is knowledgeable about. Additionally, given the number of tools available, a number of participants recommended that only a limited number of tools are employed that specifically perform a unique functionality not to confuse learners. Learners should be incrementally introduced to a tool allowing them ample time to let it sink in as well as enough time to venture, investigate and try the tool out in a safe environment. This recommendation given by a majority of the participants reflects their own experience with the tool as they struggled, enjoyed, and mastered the tool itself. Finally, the participants pointed out to ensure that the tool is strictly employed in line with a specific learning objective in mind rather than just simple used for the sake of novelty or originality. Such a recommendation brings us back to the original purpose of digital pedagogies and the educational rationale to employ tools or aids to facilitate the learning process and ameliorate the medium employed.

5. CONCLUSION

This empirical study as part of this research has shown that digital pedagogies are a complex and ever-changing entity that are necessarily part of the continuous professional development of all educators as new tools and techniques address the entire teaching spectrum. The potential of digital pedagogies has been highlighted by the feedback given by the participants while a number of point of caution have also been pointed out to ensure that such tools are appropriately employed with a clear educational purpose and in a safe pedagogical environment. Educators are required to continuously stay abreast of emerging tools and technologies ahead of their own students if possible cognizant that digital pedagogies in isolation do not guarantee an effective learning process, but that the educator's classical role of guiding, facilitating and leading is and will remain imperative.

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