

DESIGN AND IMPLEMENTATION OF A WEB-BASED SYSTEM TO SUPPORT COLLECTIVE REFLECTIVE PRACTICE

Alexios Brailas, Konstantinos Koskinas, & Giorgos Alexias, *Panteion University*

The objective of this paper is to describe the design case of a web-based system that aims to facilitate the collective reflective practice of a learning group in an academic setting. The technical infrastructure of the system is fully implemented using free web services, which requires minimum technical knowledge or expertise. A key technical component of the proposed system is a web mash-up hub node that filters and aggregates the relevant posts coming from the participating members' blogs. The overall design process, including the theoretical inspiration, the context, and the implementation, is presented in full detail. This design case can be utilized to inform and inspire other educators or reflective practitioners to design similar systems.

Alexios Brailas is a Postdoctoral Researcher in the Department of Psychology at Panteion University, Athens, Greece. Through his research, he strives to bring insights from complexity theory and practices from group psychotherapy to both formal and informal teaching.

Konstantinos Koskinas is a Professor in the Department of Psychology at Panteion University, Athens, Greece. He is the founder and director of the Virtual Reality, Internet Research and eLearning Laboratory.

Giorgos Alexias is an Associate Professor in the Department of Psychology at Panteion University, Athens, Greece. His research interests focus on the sociology of health and the sociology of the body.

Copyright © 2016 by the International Journal of Designs for Learning, a publication of the Association of Educational Communications and Technology. (AECT). Permission to make digital or hard copies of portions of this work for personal or classroom use is granted without fee provided that the copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page in print or the first screen in digital media. Copyrights for components of this work owned by others than IJDL or AECT must be honored. Abstracting with credit is permitted.

INTRODUCTION

In this paper, we present the design case of a blog aggregator web system that supports students' and teachers' group reflective practice. A design case is a 'thick' description of a real artifact or experience that has been intentionally designed and is situated in a specific context (Boling, 2010). A detailed description of the artifact's context should also be provided in a design case. The web system presented in our design case is technically based on a set of personal blogs, an aggregator hub website, and a cloud-based collectively created document or multimodal digital artifact. These technologies are interconnected and fine-tuned to support a blended (both face-to-face and online) process of reflective practice. The overall system is based on free web tools and services; programming expertise is not a prerequisite for its implementation. Therefore, it constitutes a highly sustainable design, which can be implemented by reflective practitioners with only basic technical skills and/or with minimal support from specialized IT staff.

Reflective practice can be a critical tool for peer learning and professional development, particularly in settings where people learn from their own experiences rather than from an official body of knowledge. The term "reflective practice" was first introduced by Donald Schön in his seminal book *The Reflective Practitioner* (1983). Schön's work was enthusiastically adopted by educators, as well as health professionals and other practitioners, who wanted to apply knowledge to practice and learn while being advised or supervised by peer professionals. Reflective practice can take place individually, as a form of self-evaluation, or collectively in peer group meetings. Such meetings can be face-to-face or virtual. In this paper, we demonstrate the architecture of a particular system based on face-to-face group reflective discussions, followed by online personal reflections. Face-to-face meetings can be replaced by online synchronous group discussions to meet the requirements of other learning or professional development groups. The detailed presentation of this design case can also be utilized as a blueprint guide for researchers, educators and other professionals in many fields who are interested in setting up a similar system. The

overall conceptual design of such a system is shown in Figure 1.

The proposed system was developed to support the reflective practice of a small learning group comprised of 25 participants that formed within an undergraduate course at Panteion University (Athens, Greece) during the spring semester of the 2014-15 academic year. In the following sections, we present in detail the theoretical conception and the technical implementation of this system, as well as the key design decisions we have taken. As a design case, the aim of this paper is to aid the dissemination of this kind

of knowledge (Boling, 2010). According to Smith (2010), the ultimate utility of a design case is determined by those who use it.

HOW IT ALL STARTED

This learning design was developed for a senior undergraduate course offered by our department (Psychology Department at Panteion University) on *Internet Culture*. The academic unit in charge for the delivery of this course is the *Virtual Reality, Internet Research and e-Learning Laboratory*, directed by Professor Konstantinos Koskinas who is also the principal instructor of this course. Alexios Brailas is a postdoc researcher in the same laboratory, and Associate Professor Giorgos Alexias acts as an academic advisor to many of the lab's projects. Alexios Brailas' postdoc research is in the field of educational psychology and group dynamics. Through his research, he strives to bring insights from complexity theory and practices from group psychotherapy to both formal and informal teaching. During January of 2015, approximately seven weeks before the official start day of the course (March 6, 2015), Alexios proposed to Konstantinos to undertake part of the instruction as Tutor Assistant in order to organize instruction around small group sessions and group work, while having the lecturing part substantially reduced. The idea was welcomed, and this is how the story of this design case began. The following section is written by Alexios Brailas, which describes the design work as he attempted to set the context for the intervention and prepare what later was proved to be an effective system to support a group's online reflective practice and course notes' collective creation.

Alexios Brailas is a postdoc researcher in the same laboratory, and Associate Professor Giorgos Alexias acts as an academic advisor to many of the lab's projects. Alexios Brailas' postdoc research is in the field of educational psychology and group dynamics. Through his research, he strives to bring insights from complexity theory and practices from group psychotherapy to both formal and informal teaching. During January of 2015, approximately seven weeks before the official start day of the course (March 6, 2015), Alexios proposed to Konstantinos to undertake part of the instruction as Tutor Assistant in order to organize instruction around small group sessions and group work, while having the lecturing part substantially reduced. The idea was welcomed, and this is how the story of this design case began. The following section is written by Alexios Brailas, which describes the design work as he attempted to set the context for the intervention and prepare what later was proved to be an effective system to support a group's online reflective practice and course notes' collective creation.

A BLENDED INSTRUCTIONAL DESIGN

In this design case, I was a new stakeholder and recent PhD graduate, equipped with plenty of new ideas and a strong desire to see my ideas applied in practice, which was supported by the trust of my former PhD supervisor, Konstantinos Koskinas. It was the first time I was granted part of the responsibility for this course, and this was precisely the challenge I was looking for. I wanted to put my previous research in education and group dynamics to meaningful practice—and this was my opportunity. This was also the first test for my pursuits: to check whether academic

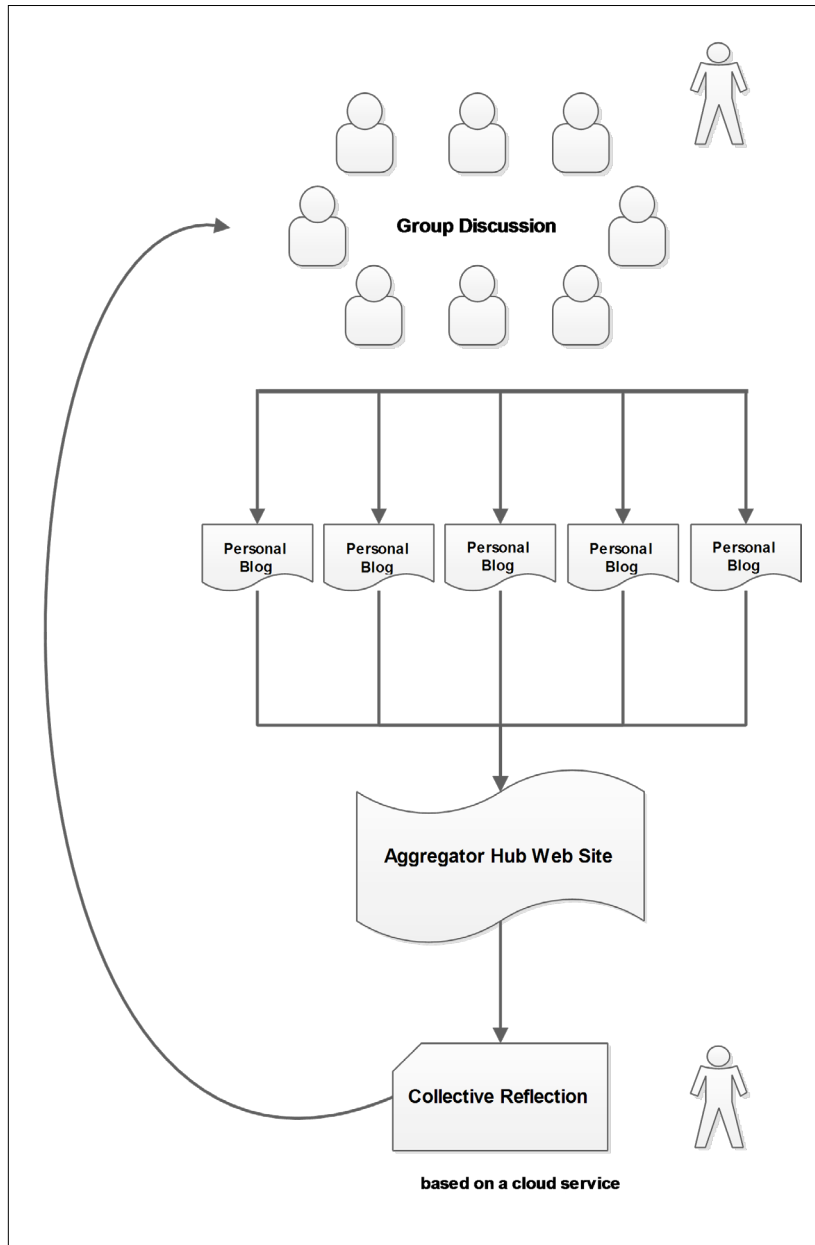


FIGURE 1. The conceptual design of a technology-supported, collective reflective practice system. The group's discussion takes place face-to-face, while personal blogging, post aggregation, and collective narrative essay writing take place online.

teaching, inspired by complexity theory and group psychotherapy practices, could be a feasible scenario.

Initially, I only had a vague idea in my head, often manifested in the conversations amongst Konstantinos, Giorgos, and myself, about what we should be looking for, that is, a system to support “bottom up” theory development by a group of students and their facilitator. This vague design idea was my gambit. As I began to envision how a course based on face-to-face small group sessions could be orchestrated and delivered—with the course’s substantive subject of study in my mind—I thought the learning process would benefit most from a reflective practice part. My initial vague idea became more concrete: a course model based on group work in face-to-face sessions, combined with online reflective practice. I further discussed my idea and conception with Konstantinos and Giorgos, which received their positive feedback and endorsement to continue with my initial design.

The rest of the story can be summarized as follows: (a) I wanted a real working system (there was no time left for a trial with a mere few weeks before the course start date); (b) I wanted it as soon as possible (in the few weeks remaining); and (c) I had no funding, so I had to implement it myself. I did not have a technical blueprint or a how-to manual at my disposal; I only had a now not-so-abstract plan to guide the design process. This proved to be somewhat stressful, but on the other hand, it afforded me creative freedom; I had to be creative yet effective at the same time. I think the coupling of these restrictive conditions catalyzed the creative inception and the rapid development of the described system. My efforts were now focused on how to implement the online reflection system. At this point, I got inspiration from the idea of automatically aggregating blog posts in a central web spot to act as a course hub that has been discussed in *Peeragogy*—a project led by Howard Rheingold and a team of online contributors (<http://www.peeragogy.org>). I also thought of the idea of using a WordPress platform to set up an aggregator hub for a course learning community, presented in a post by Jim Groom (2013) on his own blog (<http://www.bavatuesdays.com>). The idea of such a system appealed to all members of the research team. Unfortunately, it was impossible to find a step-by-step technical guide, or even an online tutorial on how to design and implement such a system. Due to the no-budget restraint, I decided that the blog aggregator component must be a *do-it-yourself* (DIY) project. Besides the technical challenge, this online reflective practice component had to

be functionally integrated into a greater blended learning framework; a pedagogical design influenced by group work and complex systems epistemology.

THE OVERALL ARCHITECTURE

The next distinct phase was to come with a more detailed design of the system’s architecture in the form of a flow chart diagram on paper (see Figure 2). By this time, I knew more precisely what I wanted and how I thought such a system would work. I acknowledged the idea that a group can produce theory (Cormier, 2010); a group demonstrates emergent properties, the byproduct of the member’s non-linear synergies. I realized that the substantive subject of study on this course (*Internet Culture*) was quite suitable for this kind of group-based inquiry. No textbook in this field is up-to-date; things are changing so rapidly globally that each newly published book would be virtually obsolete a few months after its debut. The social internet is a moving landscape (Boyd, 2014) and internet cultures are constantly redefined and renegotiated by our collective action. It seems there is

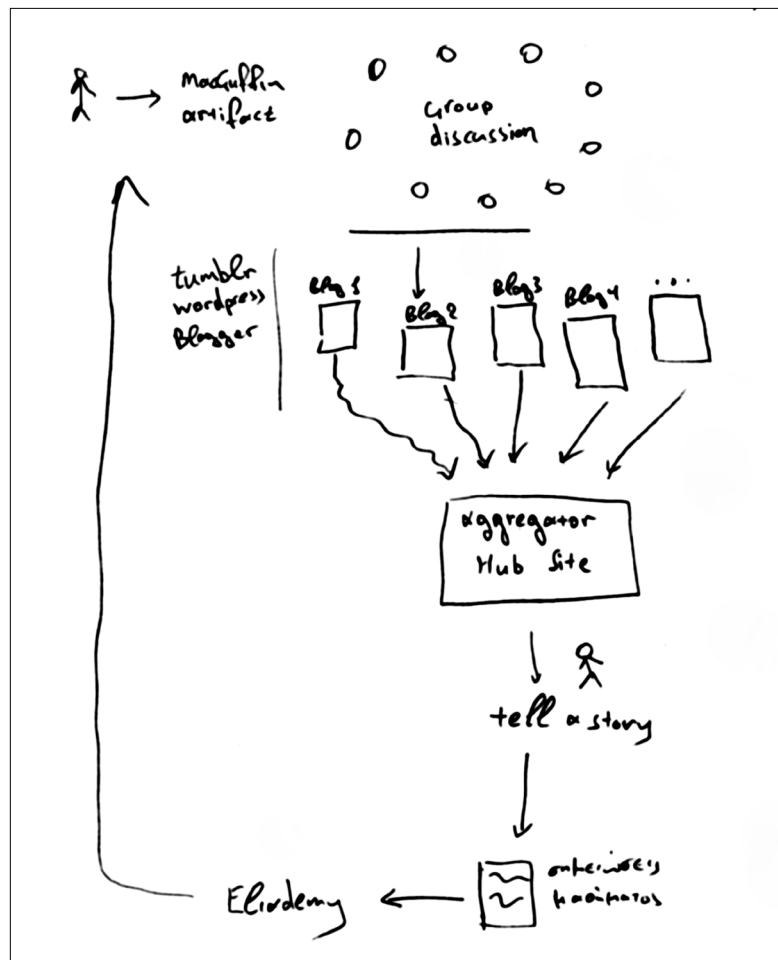


FIGURE 2. The initial (and seminal to this design case) handwritten conception of a pedagogical model based on face-to-face group work enhanced by online reflective practice.

no adequate theoretical model to describe the networked life of modern adolescents or young adults, and even if such a model were ever proposed, it would soon likely become outdated. Above all, I wanted to provide students not with an abundance of information about the course's subject, but with the necessary skills to be able to navigate successfully in the social media landscape, as well as the ability to interpret and understand the unknown. Today there is an urgent need for a new set of skills—a set of skills for humans to let them cope with the unexpected, with a liquid reality. That is why I wanted to create a bottom-up pedagogical model—an instructional design to support meaningful interaction and theory production by students working in small groups and reflecting about their networked life and social media experience. Moreover, I was looking for a networked way, through social media, to achieve this; the means of course delivery had to be compatible with its aim. I knew our destination and I knew the affordances I was looking for our journey to have.

For a group of students to become a coherent whole and to demonstrate emergent properties, it is necessary to allow for frequent and meaningful interaction—to practice doing things together in a group and to nurture concerted members' action. I knew how to achieve this in settings for group psychotherapy and psychological empowerment. I knew that what was needed was intensive face-to-face sessions of work in small groups, followed by a consummating plenary session. "But, wait a second; we live in a networked era, don't we?" I asked myself. Today there is no reason for a group to stop interacting after a face-to-face session; the group process initiated during the face-to-face meeting has to invent a way to continue online. There, in cyberspace, group work can co-create a very "tangible" artifact: the knowledge I wanted the group to produce. Knowledge in the form of collectively produced and edited course notes.

At this point, having a more concrete pedagogical model in my mind, I had to build the technical infrastructure—a blog aggregation system—without any budget or external technical support available. I had to move quickly and effectively, as there was simply no time to lose. There was an urgent need to make it work. However, although being pressed to implement this system before the beginning of the course, I knew it was a feasible goal; it should be something relatively easy to implement in a networked landscape with so many free Web 2.0 technologies available out there. It is true that no matter my stress levels or worries, every time I was devising the next missing piece in my design, I could not help myself from smiling with satisfaction. Being creative in the networked era is quite rewarding, maybe addictive even!

In the next sections, we describe the technical implementation and the rationale behind the blog aggregator component to support student's reflective practice online. We believe that this detailed description of the technical

implementation could be useful to other practitioners looking to understand our situated praxis and, perhaps, to build a similar system.

WHY IS SUCH A SYSTEM NEEDED?

In this section, we explain the rationale behind the key design decisions in developing and implementing this collective reflective practice system. Rich descriptions of the design moves constitute a quite valuable development narrative of the whole process (Howard, 2011).

Awareness of what the other group members are reflecting about their face-to-face sessions enhances the social aspect of the reflective practice; there is an intimate group audience for each member's reflection. However, frequently visiting every single participating blog to retrieve its content can take a long time and critical information could be mistakenly missed in such a disruptive web environment. Web feed technology such as RSS (Really Simple Syndication) allows blog creators to syndicate a web feed, thereby permitting other users to subscribe to it and receive a summary of the blog's recently added content (Abraham & Hassanien, 2012). Mixing a collection of web feeds and making them available in one web spot is known as aggregation (Ronchi, 2009). This aggregating web spot can be implemented by using a standalone software application running on a personal computer or by creating an independent aggregator site, also known as a mashup site. A *mashup site* is actually a website that encompasses content from other web sources to create a single web page displaying this new kind of content (Rainer & Cegielski, 2010). Maintaining the aggregated feed on a user's personal device gives the user the ability to personalize the feed. However, in this case, users have the core responsibility to maintain the feed and to cope with any inevitable technical problems. Mashing up the feed onto a new website ensures that the aggregated feed is always displayed properly, given that one person is held responsible for providing the technical knowledge and developing the required infrastructure. There are many web services that allow end users to remix information and create mashup sites without resorting to formal programming techniques (Yee, 2008). Mixing is never a neutral process just like the arrangement of flowers into a unique bouquet does not equal to the sum of the individual flowers' properties. A bouquet is a brand new complex formation; a complex system that has emergent properties that cannot be reduced to any combination of its constituents (Feldman, 2012).

A considerable amount of literature has been published on using personal or institutional blogs to facilitate reflective practice in various forms among the members of a group (Beale, 2007; Kajder & Parkes, 2012; Yang, 2009). These studies highlight the positive implications of using blogs as a medium to promote reflective practice in various settings and to build networks and communities of reflective practice.

Usually, in many educational settings, blog posts are graded by sophisticated systems, which have been developed to monitor students' progress (Gardner, 1990; Laanpere, Pata, Normak, & Põldoja, 2012). However, much of the research to date has been restricted to blog practices lacking in a mashup aggregator component. Many other proposed systems that use mashup aggregators are based on custom-made software solutions that have substantial financial costs to maintain and require dedicated technical support. So these technical solutions cannot be used to set up a sustainable (at least financially) reflective practice system. Groups that are interested in reflective practice are often informal communities of practice with minimal financial resources.

In many other proposed blogging systems, participants write their blog posts on a shared group's blog. In such a system, group members do not own their personal posts. A group administrator is responsible for maintaining the group's official blog. We believe that when a member posts a reflection on a group's web spot, this post should belong to its author. Otherwise, if the group's supporting organization—a formal or informal one—goes out of business, all the users' data could be lost, and this may not bring good motivation for someone to contribute a piece of work. In the new emerging social media reality, our active online participation and the digital artifacts we produce constitute our endorsements and students should not be deprived of them. That is another reason we moved away from a "walled garden" solution, such as traditional Learning Management Systems (LMS). In our design case, the participants control their blogging space; they can post anything they wish, and they can control when and which posts will be automatically pulled by the collective aggregator system. Posts can be streamed to other services simultaneously by using multiple hashtags, allowing authors to participate across many communities, not just one.

THE NETWORK OF PERSONAL WEB BLOGS

Following the face-to-face group interaction (as represented graphically in Figure 1), participants are asked to write down a reflective essay, or other reflective digital artifact, and publish it on their own blog using a unique, predefined hashtag. A *hashtag* is a special label that is used on social networks to make the search and retrieval of specific content easier. For the specific implementation we demonstrate here,

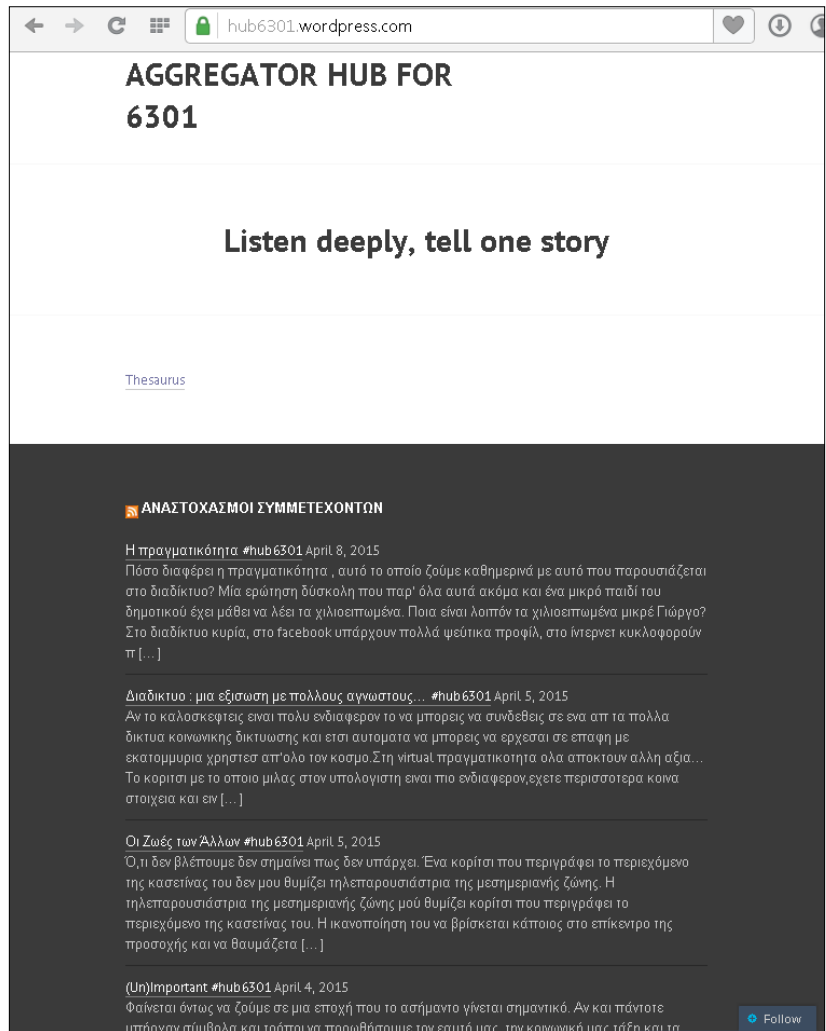


FIGURE 3. A simple aggregator hub implemented with WordPress (<http://www.hub6301.wordpress.com>). A participant's personal post is aggregated in the hub only if a predefined hashtag is used in the post's title by the author.

we used the hashtag #hub6301 (6301 was the code number of the specific academic course, so this was a meaningful hashtag to the participants). By using a special hashtag, it is possible to retrieve from a participant's personal blog feed only the posts that are labeled in this way and are therefore related to the specific reflective group process. Regarding the participants' personal blogs, these can be hosted on any blogging system, for example, WordPress, Tumblr, BlogSpot, or any other platform supporting RSS technology. RSS is a widely used web feed format. An RSS feed for a blog contains data such as the post's content and title, as well as metadata, such as the publication date and the author's nickname. A filtered RSS feed from every participating blog is what is finally retrieved by the aggregator hub, under the condition that hashtag #hub6301 is included in a post's title. Participants only need to know what the hashtag is and use it in their post's title (see Figure 3). The URL (web address) of each participating blog has to be communicated in advance to the person responsible for setting up the aggregator hub.

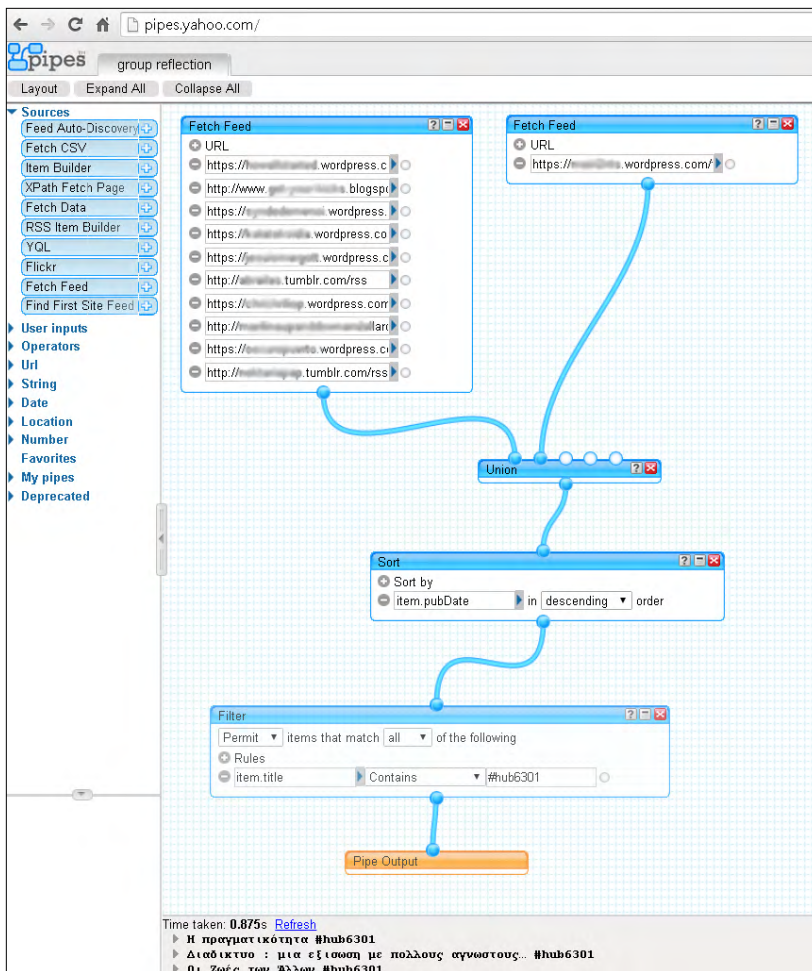


FIGURE 4. Using the Yahoo Pipes graphical editor window to remix individual web feeds that meet certain user-defined criteria.

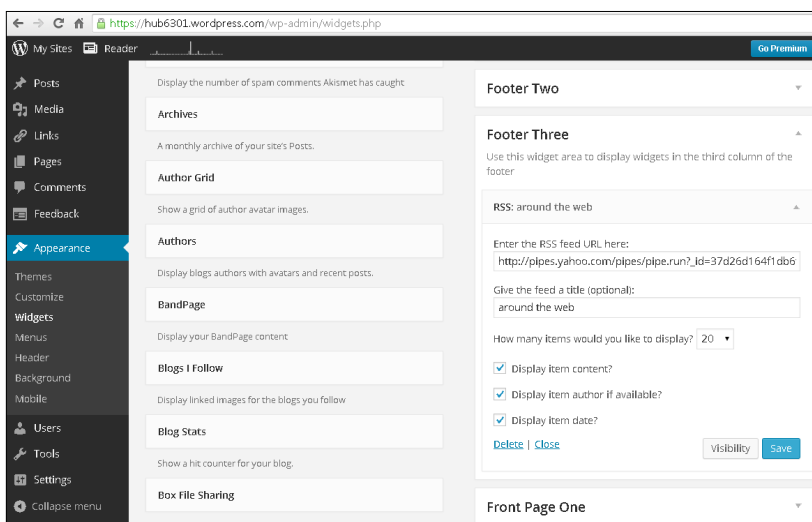


FIGURE 5. Using an RSS widget on a WordPress.com administration interface to show the combined RSS feed on a single blog page.

SETTING UP THE AGGREGATOR HUB

The first step to creating the aggregator hub is to integrate the individual blogs' RSS feeds into one single stream that contains the data and metadata for every post labeled by the predefined hashtag. By searching the web to find a suitable free solution to implement RSS feed aggregation, we discovered Yahoo Pipes by Yahoo, a service that we had never heard of before. Yahoo Pipes proved to be a convenient, user-friendly, reliable, and free service that provided us a graphical user interface (see Figure 4) for retrieving and mixing independent web feeds.

The RSS web address (URL) for a WordPress blog is the blog's address followed by /feed (i.e., hub6301.wordpress.com/feed). The RSS web address for a BlogSpot blog is the blog's address followed by /feeds/posts/default?alt=rss. The RSS web address for a Tumblr blog is the blog's address followed by /RSS (for other blogging platforms see their user documentation for specific and up to date directions).

Users of Yahoo Pipes were able to "pipe" RSS feeds from different blogs and mix them by setting up rules about what content will be finally retrieved. The design of the pipeline shown in Figure 4 is from top to bottom. On the left column, there is a set of available modules.

After finishing the interconnection and the adjustment of the modules, the pipeline was named and saved (a free Yahoo account was required). After running the pipeline, the combined feed was formed and its content could be retrieved in the unique URL provided. This URL could be easily shared among individuals. However, for a more user-friendly implementation, this combined web feed was streamed into another web blog—the aggregator hub site (in our case, <http://www.hub6301.wordpress.com>). Such an aggregator hub website can easily be constructed by utilizing a WordPress blog (or any other blog platform). Figure 5 shows an RSS widget used in a WordPress.com administration window to display the combined RSS feed. The free WordPress RSS widget can display up to 20 RSS entries, so the user has to click on the

feed name in order to follow the feed on Yahoo Pipes and to access all the available posts. Other commercial WordPress plugins can also be used to show the web feed in more elaborate ways. Also, other RSS mixing and filtering services could be used instead of Yahoo Pipes.

THE COLLECTIVELY PRODUCED DIGITAL ARTIFACT

In this section, we describe the collective production of a digital artifact—a multimodal manual of best practices or, in our design case, a collective meta-narrative that was used as the official course notes. Digital artifacts can easily be implemented on cloud-based, editable solutions such as Google Docs, Dropbox, Wikispaces, or any other similar Web 2.0 service, depending on the level of privacy or publicity that is required during this stage. In the present design case, Alexios undertook the responsibility of integrating the students' reflections into a coherent meta-narrative in a Google document. After the creation of this cloud document, the artifact was shared with the students for further editing. This collectively produced digital artifact was then used to initiate the next face-to-face course meeting, leading to a spiral practice of group work and collaborative artifact development. We think that this spiral course deployment, enhanced by students' interacting reflections, is closer to the conception of the whole classroom as a complex living system (Davis & Sumara, 2006; Ricca, 2012). In our design, the final digital artifact took the form of a collectively edited volume (see the cover in Figure 6) containing the weekly produced reflective chapters. This volume proved to be quite sophisticated and was finally utilized as the course's textbook (see <https://leanpub.com/culture> for the published edited volume).

FLAWS IN THE DESIGN

Initially, we thought that an internally managed automated aggregation system would be superior to a design based on a course blog managed by an external organization. In the proposed design, there is no need for an external administrator to maintain the central course blog. However, the proposed aggregator system imposed increased workload burden on the instructors' shoulders, especially for Alexios who undertook the main responsibility for supporting the web system.

We also undertook the task of training students on how to create personal blogs (a more demanding task in comparison to simply creating an account on a shared blog), and to explain what a hashtag is and how to use one. Most of the students created a blog for the very first time during our intervention; the teens' prior years of immersion in social media and Facebook proved to be inadequate in automatically



FIGURE 6. The cover of the produced artifact: an edited volume based on the students' reflections and their synthesis into a collective narrative. The cover was designed by student Christina Gkini, who was inspired by her personal experience during the course.

providing the necessary digital skills to cope effortlessly with this new task. Twitter is not utilized so much among Greek youth, so even the use of a hashtag was known only to a few students. Digital literacy about online privacy issues and coping with this area was also inadequate—instructors found themselves in the position of having to explain basic aspects of blog culture, pseudonym usage, and how to protect their privacy online. However, as the subject of the course in question was Internet culture and the networked life of modern teens, this was perhaps not a major concern.

Another flaw in the design that we realized during the implementation of the system was the workload imposed on Alexios due to the weekly task of integrating the students' reflections in a coherent meta-narrative. We discussed this point and concluded that although it is critical for the facilitator to read all participants' reflections carefully, this task could be overwhelming for an instructor as the number of individual contributions rises. A solution to this needed to be devised.

STUDENTS' EXPERIENCE OF THE DESIGN

In this design case, students undertook the responsibility to voluntarily write and publish, in their own blogs, a personal reflection about their immediately preceding lived experience during the face-to-face, in class, interaction. In this sense, individuals' contributions were manifestations of their group work process. We think of these contributions as the byproduct of members' synergies during the group's interaction. These complex in-group synergies finally become embodied actions (Gergen, 2009) manifested in the participants' blog posts. But how did students actually experience the overall process? During the last face-to-face session, students were invited to evaluate this course design and reflect on their overall lived experience. We provide here some representative excerpts from their final evaluative blog posts. The original blog posts were written in Greek and translated into English for the purpose of this paper.

Some students focused on the importance of being the *prosumers* (producers-consumers) of the official course notes:

"Knowledge was produced by all of us in every lesson. We were the creators and the co-authors of the course notes so we were motivated to study with pleasure what was the result of our collective endeavor" (Kalataksidia, 2015).

Other students focused on the very experience of trying to synthesize the participants' voices into a collective narrative:

"It was a course design that respected every student as a human being. One picture keeps coming to my mind every time we tried to discuss, to talk, to co-construct meaning altogether: a Pollock's painting where the creator fights to generate some constructive lines from an abstract synthesis" (Marilina, 2015).

Our initial intention as instructors was to develop a course based on the principles of complexity science. A useful metaphor for this kind of pedagogy is that of the rhizome: "A rhizomatic plant has no center and no defined boundary; rather, it is made up of a number of semi-independent nodes, each of which is capable of growing and spreading on its own, bounded only by the limits of its habitat" (Cormier, 2008, para. 4). In rhizomatic learning, *the community is the curriculum* (Cormier, 2010) and the presented design case supported this approach successfully.

Another student focused on the polyphonic orientation of this course as a result of its design:

"[This course] offered a better teaching model, a model that actively engaged students and created new conditions for the knowledge production and consumption. Behind this course's design and especially behind using personal blogs to reflect on every group's interaction lays this simple axiom: dear student, dear social actor, you have a voice (Logos); you have engaged in a face-to-face group process, now step back and reflect your experience on the topic we approached. You have a voice and your voice counts. And your voice was channeled at the web hub along with the voices of the other participants. And I found myself regularly refreshing the web page to check if there were new posts from my collaborators; to see what motivated the other participants, to see how they have experienced our group interaction. I wanted to know what the other participants were thinking of, because we gathered together every week and we produced something together, and I learned to respect and appreciate their voices. 'Listen deeply, tell one story' were the central slogan at the aggregator hub site. The course notes came up from the weekly synthesis of the participants' posts. It was like someone was telling you: your

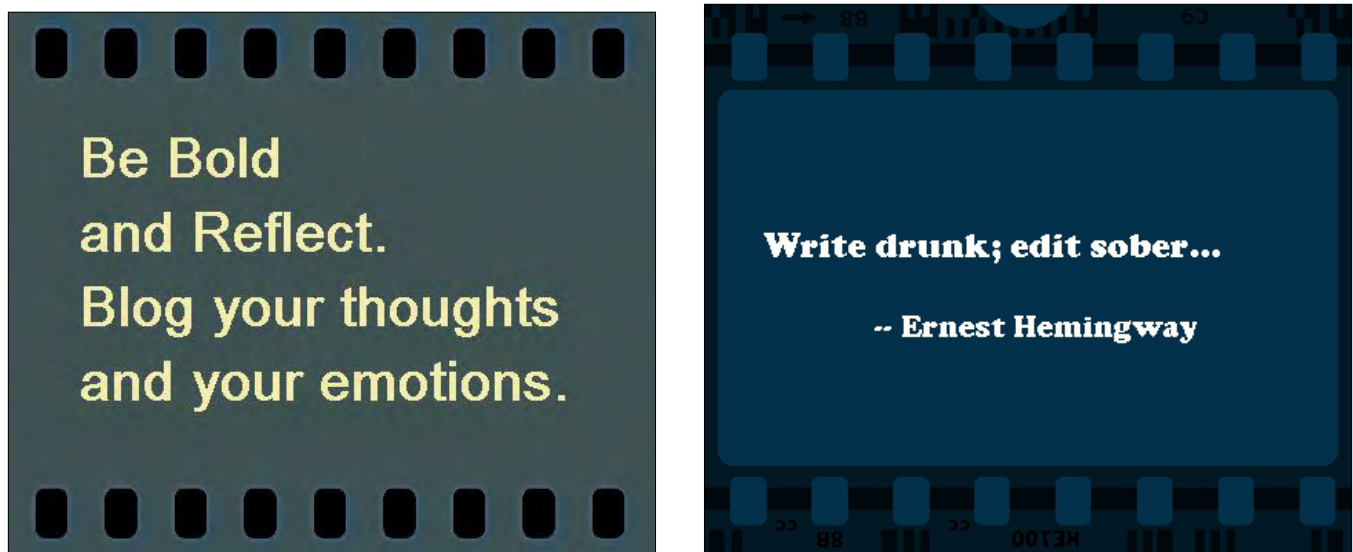


FIGURE 7. Students were prompted by the above images shown on <http://www.hub6301.wordpress.com> to be bold; they were encouraged to reflect without censoring themselves, in order for the unspoken to be spoken and realized.

voices can produce substantive subject knowledge" (Kicks, 2015).

FURTHER DISCUSSION

In this paper, we present the conceptual design, the technical architecture, and the implementation of a web-based system to support the collective reflective practice of a group. Our experience is that the proposed system, once technically set up, "works like a charm." This expression represents the designers' feelings when they implemented the system and realized that it was able to aggregate the participants' reflections in a timely and accurate manner. The overall system is financially and technically sustainable, as it is based on free web services and technically maintained by their providers. From the initiator, it does require some technical skills and basic social media literacy, such as what a web feed is and how to use Yahoo Pipes (or a similar service) to combine and filter blog feeds; also understanding what a hashtag is, how they are used, and how to set up an aggregator blog hub. However, advanced technical expertise is not required by the end users of this system. Furthermore, this design case can also be used as a technical guide for the future implementation of such a system. Participants only have to know (or be taught) how to keep a blog, write posts, and use predefined hashtags.

Social web tools are a constantly moving landscape, meaning that no free, or even paid, web-based solutions (like the one we propose here) can be guaranteed to work forever. The proposed system relies heavily on blog RSS feeds and the Yahoo Pipes web application, so if some of these services were to be discontinued in the future, alternatives solutions would be needed. This is actually the case with Pipes, as Yahoo terminated the service as of September 2015. However, there are many similar (both free and paid) services that can be utilized in a similar design to substitute Pipes' functionality.

The proposed design was based on our desire to help the unspoken be articulated and realized. Thus, we prompted students to be bold in their reflections, through giving directions in class and by placing the two slogan images shown in Figure 7 on the hub aggregator site (hub6301.wordpress.com). The dominant teaching culture in academia in Greece is lecturing, note-taking, and memorizing. We wanted to convey the message, "Hey! It is good to reflect on your subject, and your reflections are valuable, so do not hesitate to reflect and speak your mind; be as critical as you feel". To avoid any inhibitions and to protect students' privacy, we prompted them to blog their reflections by using pseudonyms. Persistence, visibility, spreadability, and searchability are some key social media affordances (Boyd, 2014) that we think educators should have in mind when designing blended reflective systems.

In the proposed system, the participants own their personal blog space, and it is up to them to maintain their blog posts for as long as they want or to delete them after the collective reflective process concludes; therefore, the whole system is quite versatile. The collected narrative in the form of the cloud-based document or digital artifact has to be made when the reflections are "on air." We think that this design resembles more the function of a living system (Agazarian & Gantt, 2000; Prigogine & Stengers, 1997) and we celebrate the possibility of a change in the aggregator's hub feed after the termination of the collective group process.

Group process in the form of a focused discussion or any other collective activity can take place in a face-to-face setting. The proposed architecture was conceived, implemented, and tested to facilitate a face-to-face learning group interaction. However, group interaction could take place online by utilizing social media tools and/or teleconference systems. Personal blogs and the proposed aggregator hub are public spaces. As Rheingold and Weeks (2012) point out, "In the world of digitally networked publics, online participation – if you know how to do it – can translate into real power. Participation, however, is a kind of power that only works if you share it with others" (p. 112). If the participant's reflection contains sensitive information, like in the case of psychiatric practitioners, an alternative technical infrastructure should be developed. In any case, the group's reflections in the proposed system should contain information that is safe to be shared online. This can be clearly stated in a group policy, and participants should be advised not to share online any sensitive, professional information.

Reflective practice or any other group process is, by definition, always situated. The proposed system was designed and developed with a specific implementation in mind and reflects the researchers' educational and professional practice and needs. So this system may or may not be suitable for other educators and professionals. According to Boling (2010), sharing rigorous design cases has the potential to offer critical teaching and learning opportunities for many other practitioners. Therefore, in this paper, we demonstrate the technical infrastructure in detail and the epistemological rationale behind it in order to help other practitioners, in any other context, to utilize the system or adapt it to meet their own pedagogical or professional development needs.

The Hub6301 aggregator site created a sense of co-creation with others in that a student could experience the group's reflective context; a participant could situate his/her own reflection in the group's wider reflective virtual space by not only interacting with the others in the preceding face-to-face session but also by seeing and experiencing the process of other people's reflections. Thus, the aggregator web spot was furthering the group work online and fostering a sense of working together in a community of practice to collectively produce a digital artifact. In the described system, the

initial meaningful face-to-face session ensured an overall effective blended learning design.

Concluding this paper, we feel the need to share our conviction that writing authentically a design case is quite a transformative experience. Firstly, because it helps us—as practitioners—better understand our practice by focusing on details that otherwise, under the pressure of the daily routine, would have been neglected or forgotten. Secondly, because by documenting our practice, we can review it later—even after a year—and realize how and why our present professional practice evolved so much and became better informed. It is this focus on the process, not on the outcome, that matters.

REFERENCES

- Abraham, A., & Hassanien, A. E. (2012). *Computational social networks: Tools, perspectives and applications*. Haildeberg: Springer.
- Agazarian, Y., & Gantt, S. P. (2000). *Autobiography of a theory: Developing the theory of living human systems and its systems-centered practice*. London: Jessica Kingsley.
- Beale, R. (2007). Blogs, reflective practice and student-centered learning. *Proceedings of the 21st British HCI Group Annual Conference on People and Computers: HCI... but not as we know it* (Vol. 2, pp. 3–6). University of Lancaster, United Kingdom: British Computer Society.
- Boling, E. (2010). The need for design cases: Disseminating design knowledge. *International Journal of Designs for Learning*, 1(1), 1–8.
- Boyd, D. (2014). *It's complicated: The social lives of networked teens*. USA: Yale University Press.
- Cormier, D. (2008). Rhizomatic education: Community as curriculum. *Innovate: Journal of Online Education*, 4(5), Article 2.
- Cormier, D. (2010). Community as curriculum. In D. Araya & M. A. Peters (Eds.), *Education in the creative economy: Knowledge and learning in the age of innovation* (pp. 511–524). New York, NY: Peter Lang.
- Davis, B., & Sumara, D. J. (2006). *Complexity and education: Inquiries into learning, teaching, and research*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Feldman, D. P. (2012). *Chaos and fractals: An elementary introduction*. UK: Oxford University Press.
- Gardner, H. (1990). *Art education and human development*. Getty Center for Education in the Arts.
- Gergen, K. J. (2009). *Relational being: Beyond self and community*. New York, NY: Oxford University Press.
- Groom, J. (2013, August 14). *Building with Howard: Creating a learning environment with open source tools Pt 1* | bavatuesdays. Retrieved from <http://bavatuesdays.com/building-with-howard-creating-a-learning-environment-with-open-source-tools-pt-1/>.
- Howard, C. D. (2011). Writing and rewriting the instructional design case: A view from two sides. *International Journal of Designs for Learning*, 2(1), 40–55.
- Kajder, S., & Parkes, K. (2012). Examining preservice teachers' reflective practice within and across multimodal writing environments. *Journal of Technology and Teacher Education*, 20(3), 229–249.
- Kalataksidia. (2015, June 12). An end is always a new start #hub6301 [Web log post]. Retrieved from <https://kalataksidia.wordpress.com/2015/06/12/an-end-is-always-a-new-start#hub6301/>.
- Kicks. (2015, May 23). Wrap #hub6301 [Web log post]. Retrieved from <http://get-your-kicks.blogspot.gr/2015/05/wrap-hub6301.html>
- Laanpere, M., Pata, K., Normak, P., & Põldoja, H. (2012). Pedagogy-driven design of digital learning ecosystems: The case study of Dippler. In E. Popescu, Q. Li, R. Klamma, H. Leung, & M. Specht (Eds.), *Advances in web-based learning - ICWL 2012: Vol. 7558*. (pp. 307–317). Springer Berlin Heidelberg.
- Marilina. (2015, May 29). #hub6301 Closure [Web log post]. Retrieved from <http://marilinaupanddownandallaround.tumblr.com/post/120183962715/hub6301-closure>
- Prigogine, I., & Stengers, I. (1997). *The end of certainty. Time, chaos, and the new laws of nature*. New York: Free Press.
- Rainer, R. K., & Cegielski, C. G. (2010). *Introduction to information systems: Enabling and transforming business*. John Wiley & Sons.
- Rheingold, H., & Weeks, A. (2012). *Net smart: How to thrive online*. MIT Press.
- Ricca, B. (2012). Beyond teaching methods: A complexity approach. *Complicity: An International Journal of Complexity and Education*, 9(2), 31–51.
- Ronchi, A. M. (2009). *eCulture: Cultural content in the digital age*. Springer.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. USA: Basic Books.
- Smith, K. M. (2010). Producing the rigorous design case. *International Journal of Designs for Learning*, 1(1), 9–20.
- Yang, S.-H. (2009). Using Blogs to Enhance Critical Reflection and Community of Practice. *Journal of Educational Technology & Society*, 12(2), 11–21.
- Yee, R. (2008). *Pro Web 2.0 mashups: Remixing data and web services*. Apress.