DIGITAL CURATION AS LEARNING ACTIVITY

Rivki Gadot, Ilya Levin

School of Education, Tel Aviv University (ISRAEL)
rivkaga@openu.ac.il, ilia1@post.tau.ac.il

Abstract

Social media is traditionally defined as a plurality of Web applications supporting creating and exchange of user-generated content. In this paper, we propose a more general understanding to this phenomenon. We consider the Social media as a cultural phenomenon, enhancing interpersonal communication and changing the nature of relationship between an individual and a society. Web 2.0, that is a technological basis of social media, provides possible forms of network activity such as social networks, blogs, forums, wikis, etc. Digital curation is one of the most innovative types of the social media. The curation is a specific form of blogging, in which one receives an input stream of data generated according to a predefined set of keywords, and then carries out his/her own filtering by selecting messages around specific topic, which in the curator's opinion are of interest and are "worthy" to be included in his/her personal "curation blog". The result of "individual curation" is a curated stream of content. Different curated streams may interact, thus forming meaningful networks. In turn, management of the curated streams *of* different users may be called meta-curation. A meta-curator may direct the streams in a desired direction. In our paper, this model is proposed for new learning activities where students created curated streams and a teacher performs meta-curation, for example, according to the aim of a lesson. The curation phenomenon is a natural result of the evolution of learning activities in the classroom.
Indeed: a) in a traditional class characteristic for industrial society, the learning process goes from observation to forming the content, then to an oral and written statement of the content in a form of presentation or composition; b) in a post-industrial class, the process goes from learning materials mostly found on the web*,* and web surfing to analysis and storing the content, and finally leads to the curation*.* We conduct our study in a group of MA students' participating in a research seminar. Scoop (http://www.scoop.it/) is used as a curation tool. Each of participants curates his research topic. He/she selects, collects, tags, comments and shares materials enriching the topic. At the end of the course, students summarize their curation experience in a form of written report.
The study consists of two stages. At the first stage, we follow the participants' curation topics in order to understand how their personal identities affect their work. The second stage includes observations of the class discussions regarding the curation activity and analysis of students' believes about the curation process. The paper provides our preliminary results that allow estimating the curation as a tool with great potential in education.

Keywords: social media, digital curation, personal identity online, data intensive science.

1 SOCIAL MEDIA

Social Media (SM) is a term used to define the tools and technologies, which emphasize the social aspect of the network as a channel of communication, sharing, expression and creativity [1]. SM is traditionally defined as a plurality of Web applications supporting the creating and exchange of user-generated content.

SM is intended to be a media built by humans for their own social needs, which means that the media is not intended for passing information managed by various entities, but for passing individual's information. In simple words, each person can bring his/her story to the network. In SM, the news reported by individuals often appear more quickly than those from professional communication entities.

In this paper, we give the SM phenomenon a more general, and even more spiritual understanding than it is presently accepted. We consider SM as a cultural phenomenon, enhancing interpersonal communication and changing the nature of relationship between an individual and a society. SM deals with constructing of a new type of collective consciousness in the society by creation of *knowledge communities* and supporting such factors as *crowd sourcing* and *self-regulation*.

The contemporary teaching process accompanied by the intensive entry of SM to classrooms takes place under conditions of the following three phenomena: *interactivity, sociality and data intensive science learning*. We will understand these terms as follows:

Interactivity - in the sense of mediating between people using and Influenced by their personal identity as it is formed in cyberspace, and defined as Personal Identity Online (PIO).

Sociality - in the sense of communities which are being raised around certain areas and performed a new way of forming social consciousness which is the value laden of SM.

Data intensive learning - in the sense of syndication (mash-up) and combining data from various web sites.

In the age of data growing faster than technology, social tools and Web 2.0 environments allow the learner to adopt research and creative positions without overlooking the social dimension [2]. As school is a mirror image of society and education should move forward and adapt social and cultural trends that occur in the world [3], we need to create a new post-industrial class at Web 2.0 era, which is Education 2.0.

2 PERSONAL IDENTITY ONLINE

PIO is the way of choosing how to present oneself as a personality in cyberspace. The concept of PIO personifies a specific characteristic of an individual's behavior in a network environment, which manifests itself in the form of a unique opportunity to form and exhibit the individual's identity differently than it is done in reality [4]. Personality is something that belongs to a person, a model that develops in his/her head, his/her individual identity and collective consciousness, which have evolved in certain places: society, family, culture.

In contemporary life, the division between online and offline is being erased [5], web-life is strongly entering normal life and greatly affects personality formation. The line between a real person (or the ''offline'' one) and his projection onto social networking sites (the ''online'' self) is becoming blurred and the most intimate thing that we can have - our own persons and our own selves - are being affected significantly by the technologies [6].

Self perception of an individual in the post-industrial society not only may change, but is already changing, and not only cognitively but also through behavior. An individual may formulate and often formulates his identity in a cyberspace differently than in real world. Each person may formulate his *infosphere* during his life, by presenting knowledge about himself that he himself produced, his thoughts and his memories. All mentioned above is actually the PIO. Many people are constructing their own alternate personas online; even social networking media, which are assumed to be the place where one reveals oneself to others, are also being used in such a way as to present entirely new personae to the public [6]. Some people prefer using their real names while acting online, while others prefer to be anonymous, identifying themselves by means of pseudonyms that reveal varying degrees of personally identifiable information [7].

S. Papert [8] noted that personalization of the learning process is strongly connected with expressing and forming the learner's personal identity. From the educational point of view, the meaning of PIO comprises: a) subjectivity of knowledge - in the meaning of actively using personal knowledge that exists in one's mind, instead of using only/exclusively the commonly accepted objective resources of knowledge; b) personal knowledge and a personalized curriculum - instead of using a pre-structured, standard curriculum.

S. Papert puts emphasis on the intimacy of the educational process; he mentions that the personal component has always been to him not only an essential component of learning environments, but also an exclusive one. Levin and Kojukhov [4] noticed that pure virtual micro-worlds, when representing a highly personal learning environment, are often devoid of the most important component of education - the social component.

In our point of view, in order to adjust the constructionist approach to Education 2.0 we should integrate the personal/intimate aspect along with the social aspect.

The argument today is that an intellectual develops himself not only as a result of the person's ability to concentrate, perform self-education (as the liberals say**),** but also as a result of building a micro-world for that education, while this micro-world is created as a social activity.

3 DATA INTENSIVE SCIENCE

“Since at least Newton’s laws of motion in the 17th century, scientists have recognized experimental and theoretical science as the basic research paradigms for understanding nature. In recent decades, computer simulations have become an essential third paradigm... As simulations and experiments yield ever more data, a fourth paradigm is emerging, consisting of the techniques and technologies needed to perform data-intensive science” [9].

Nowadays, while the society becomes more virtual, for example by allowing access to data and knowledge almost without limitations, becomes more simulation-based and virtualization-based, there are changes also in the educational process. The learning becomes more individual where non-formality and creativity may dominate; the exponential growth of data consumed by an individual brings a fourth, data-intensive paradigm, which is the Data Intensive Science (DIS).

In the "coming" postindustrial society, information becomes the center of society as opposed to the "stepping aside" modern society that was an industry-intensive society. The nature of the post-industrial society, in terms of information, is not that "a society with a lot of information", the emphasis should be on the domination of communication. A post-modern person is more someone who would participate in a broad spectrum of data communications, rather than a person having wide and deep knowledge.

A computer becomes a social-nature tool instead of a technological-nature tool it was before. The post-industrial society is going back to de-reification, in some aspects returning again to spirituality instead of materialism. While the objective materialists say that material things come before the spirit, we see that people communicating in the post-industrial period make things abstract so that they lose their concreteness. Due to the information technology development, there is a great amount of online content, which enables an ordinary individual to use it. For example, the individual may not only be exposed to obtain any public research results, but may also get some raw material data before processing to perform the research himself, or to make an alternative research.

Today we are witnesses of the fact that Web 2.0 is a media that produces new knowledge, and that a social network is incredibly powerful tool for "upgrading" the humankind. Information networks play an important part in re-deployment of human behavior; a social network is an important tool for strengthening a human. After all, the capitalism has brought personalization, openness and partnership along with virtualization; today the human advancement in knowledge lies in cooperation [10]. The essence of a virtual society is openness that contributes to promotion of the world society. Part of the knowledge a personality acquires remains at a spiritual level of tacit knowledge, infosphere. That was always in the margin in previous centuries, while today we have the opportunity to take advantage of the personal knowledge to intellectually advance the world's population (In other words – to increase the collective knowledge and to improve life of the society). There is no miracle in that the collective mind may work much more efficiently than the mind of a single average person. Appearance of fast computer networks was an epistemological turning point in the development of collective intelligence [11].

4 DIGITAL CURATION

Our research has occurred in the area affected by the three phenomena mentioned above. S. Papert initiated the idea that personal micro-worlds would replace the standard classroom-based education. We suppose, that the personalization of the micro-worlds is insufficient for effective educational process, and that construction of a curriculum still should be considered. However, it should be a novel type of curriculum. An answer to that may be a new action called Digital curation.

Digital curation (DC) or content curation - is an innovative phenomenon from the field of social computing which includes widespread kinds of network behavior. DC is the selection, preservation, maintenance, collection and archiving of digital assets (Wikipedia). “Curation is a special form of blogging, in which students receive an input stream of data generated in accordance with a predefined set of keywords (tags), and then carry out their own filtering (with supervision) by selecting the messages (data), which in the student's opinion, are of interest and are "worthy" of being included in their personal "curation blog". We believe that DC as a learning activity combines the three phenomena mentioned earlier: Social Media (SM), Personal Identity Online (PIO), Data Intensive Science (DIS). Actually, students build their own personal curriculum by applying their PIO, using in their own way the great amount of data available on the Web (by applying DIS) during a significant social activity (by using SM).

In the era where the amount of information possessed in the network grows at the exponential rate, the digital curator has a great job. As in museums, where curators are responsible for organizing exhibitions according to a central idea, the content curator is responsible to choose the best content on a given topic. The content curator acts at his discretion, by applying his personal perspective; selects a presentation form for the selected content; cleverly appends the selected content to the rest of the “exhibition” created.

Any curator serves as a judge, the importance of his work is a function of his comprehension, judgment and discretion over the curation process. At the end, the curator introduces the final product that should become a treasure, and this is to reflect his ability to meaningfully integrate his knowledge and his ability to create "his story" on the theme.

However, contrary to the museum curator, the digital curator works in a social environment and constructs his knowledge in a process of combining social interaction, peer learning, knowledge sharing, and reflection and peer review.

5 METHODOLOGY

We consider the curation as an excellent educational activity in the postindustrial class, which perfectly corresponds to the present stage of social media. In a conventional graduate seminar class, reading and documenting research papers is the main course requirement. Usually students perform a small-scale research, participate in a class colloquium, give an oral presentation and submit a final work. We assume that all the above activities are irrelevant in a social media era. Intensive using the “copy-paste” action decreases the value of documenting; outstanding “cosmetic” features of the presentation software turn the learning to the advertising. Fortunately, Web 2.0 opens great opportunities to improve the learning process. Instead of the reading, documenting and presenting data, students curate the content; their teacher becomes the meta-curator.

5.1 Participants

The participants of our study were two groups of graduate students. Group 1 (G1, n1=35) was a group of Science, Mathematics and Technology Education (M.A.) students, each participating in a research seminar. Group 2 (G2, n2=14) was a group of Business and Management (M.B.A) students who were attending an advanced course. The students of each group were requested to do their works according to their course’s requirements.

5.2 Instruments and Procedure

Scoop (http://www.scoop.it/) was used as a curation tool (a generator of a curation stream) by the students of both groups. They had to select, collect, tag, comment and share materials enriching a topic chosen by them. Each student of Group 1 (G1) was requested to choose a topic for his research and to curate his topic so as to build his personal curriculum to the topic. The students were allowed to submit their final seminar work in pairs, but the curation project had to be done individually. The curation project for G1 was chosen as an alternative to a conventional oral presentation they were usually required to give at the seminar. The G1 students got specific instructions about what they had to do in their curation work. They had to curate the content from the curation stream generated by Scoop, from other Internet sources they found by themselves and from academic journals.

The students of Group 2 (G2) were given a paper directing their projects. The teacher selected three main subjects from the paper. The students were divided into three groups and the students of each group had to curate their topic according to the article, while focusing on the group’s specific subject. The curation project for G2 was an alternative to a wiki project that was given to students of this course in previous semesters.

The students of both groups received instructions about the curation in general and about using the Scoop in particular. We told them how to create an account, how to create a topic, curate and maintain the topic. The students could choose whether they wanted to identify themselves by using their real names, or just by using a nickname. The students also got instructions about what they were demanded to do while curating, such as: to diversify their resources, to use academic resources in addition to other ones, to write *their* point of view while curating any item, to tag it, to use social tools to share knowledge with others, etc.

During the semester we held discussions in classes about the topics' content and about the procedure. At the end of the curation project, the students of both groups had to summarize their curation experience in the form of a written report, which actually presents the sum and the analysis of the personal curriculum to the selected topic.

5.3 Method

There are three phenomena that, according to our hypothesis, have to be expressed in the curation process: Personal Identity Online (PIO), Data Intensive Science (DIS) and Social Media (SM). The analysis of the students' curation activity was divided into three domains corresponding to the three mentioned phenomena. The present study is a preliminary research. Meanwhile**,** we have defined a number of the main activities connected to the curation process. The aim of the preliminary research is to estimate the perspective of the curation as a learning activity.

The variables are sorted by PIO, DIS, SM as follows:

Personal Identity Online

Operation
Frequency of searching and gathering information (entries per week)
Matching of the items to the subject
Quality of sorting and filtering information
Tagging (average number of tags per item)
Display of personal perspective
Combination and integration in the existing information
New product quality
Number of followers
Percentage of items that have been re-scooped
Diversity of resources (blogs, academic papers, TED, etc.)

Digital Intensive Science

Operation
Frequency of searching and gathering information (entries per week)
Matching of the items to the subject
Quality of sorting and filtering the information
Tagging (average number of tags per item)
New product quality
Diversity of resources (blogs, academic papers, TED, etc.)

Social Media

operation
Tagging (average number of tags per item)
Rating by the site
Number of visitors
Number of followers
Number of followings
Number of responses made on items
Diversity of resources (blogs, academic papers, TED, etc.)

The study consists of two stages. At the first stage, we followed the participants' curation actions and analyzed their work according to the variables mentioned above. We tried to find out which of these parameters are most important and how we can classify the students in accordance with their curation activities.

The second stage of the study includes observations of the class discussions and of the written report regarding the curation activity, in order to analyze the students' beliefs about the curation process and about the change that occurred in their attitudes during their curation activity.

5.4 Results and discussion

As mentioned above, the analysis of the students' curation process as a learning activity was divided into three domains: Personal Identity Online (PIO), Data Intensive Science (DIS) and Social Media (SM).

5.4.1 Personal Identity online during curation activity

The content curation appeared to show itself as a spiritual act. The students reported that they enjoyed to curate information about subjects they were interested in and picked up by themselves; that they were doing it more willingly than if we (teachers) would give them the curation topics. It should also be emphasized that since the students' work in G1 was completely independent in terms of the content, the process was more productive and the learning seemed to be more significant as the students were in the center and they had to deal themselves with complexity of the subject.

A number of different types of behavior were mentioned during the students' curation process. The students can be divided into four groups in accordance with these types:

- The first group comprises the students who prefer to use multiple resources and personalize the obtained content. These students rarely look for information of other curators and also rarely share the information.
- The second group of students prefers to use a limited number of resources and personalize the obtained content. The students of this group prefer the sites and the information resources that were familiar to them before, and didn't look elsewhere. They rarely followed other curators' topics and rarely shared the content.
- The third group of students used multiple resources of information, which was followed by the information socialization and not personalization. Students of this group usually find the content in a variety of resources and, as a rule, use co-curators and information sharing for this purpose.
- The fourth group of students used few resources of information, and put emphasis on socialization activities. Students in this group contacted colleagues and curators and often

used social tools, but most of the materials were curated from these few resources and not from external resources or from the curation stream.

The curation activity entails an aspect of personal exposure. Some of the knowledge acquired by individuals during their lives stay on a spiritual level and remain at the level of tacit knowledge. We expect this knowledge to be reflected as well as influenced in the curation process. Selecting the contents, putting them together, publishing them and in addition giving to the content a personal aspect of the student's intellectual point of view is a kind of giving the world permission to watch your intellectual personality.

In light of the above, the students can be classified according to the following two criteria:

Openness or readiness for exposure. The majority of students from both groups (G1 and G2) used their full names during the curating while the minority did not identify themselves.

The role of the PIO in the behavior. Degree of influence of the PIO in the personal curation process, may be expressed by:

- The style of expression of a personal opinion during publishing.
- The style of commenting the curated content of other curators.
- The frequency of tagging.
- The level of sharing and following others.
- The level of connecting with outside curators.

5.4.2 Role of Data Intensive Science in curation activity

Personal knowledge of the students is developed in an academic environment that was not built in advance and therefore should contain redundancy. Integration of diverse resources of knowledge into the educational sphere, for example - written resources, communication resources, experts' opinions and cultural products - was an important parameter while analyzing the students' curation topics. The redundancy added an extra meaning to forming a combination of subjective resources with objective resources and to the understanding that knowledge was not complete and its distribution was not only given to experts. In these circumstances, the students outlined a way of learning that was appropriate for them. Another important point is that the teachers' role in the research was to help the students to navigate their way, rather than to provide knowledge to the students directly. In our preliminary research the students curated and created different outcomes by different ways (and also belonging to different association groups as detailed in the previous section), even when the subjects were somehow defined. Students testified that the experience deepened their understanding of the critical importance in selecting information resources and that the process improved their meta-cognitive abilities.

There was a great discussion in the class about the distinction between selection vs. curation and we realized that we have to sharpen this point. We ascribe a great meaning to the curation as to a powerful activity that produces a treasure if the curator understands his role. In particular, the curator's role is selecting wisely the best items in the era of explosive growth in data, putting the information in coherence, so as to allow his audience to rely on his curation. Analysis of the students' work has shown that the students who understood the meaning of curation produced better outcomes, although the perfect way for implementing this idea is still far away.

5.4.3 Curation Activity as Social Media in Classroom

Social computing provides tools that empower the constructivist learning process. It expands the process of collaborative learning and emphasizes the mutuality between the construction process of each student and the cooperation and social relations created in the learning community. The learning community may consist of participating people who are far away in space and time.

Many researchers have found that the students we teach today are so-called "digital natives"; they have different patterns of work and different learning preferences than older students have, that students of this generation have social motivation for learning, they want to impress each other and join forces to help the group tasks, therefore the combination of social networking and education is necessary [12], [13]. Still, we have found that there is a strong correlation between the motivation to the learning in general and to the using social tools in the learning process - and that it's not all about technology. Preliminary examination of our findings indicated that the contribution of socialization increased the quality of products more than the contribution of diversifies of resources. In addition,

there is a direct proportion between the level of personal activity of students - that is the level of the contribution of their personality to the process - and their social sharing. Perhaps, this factor could explain the students' motivation level that is an important factor in terms of contribution to the process and the product quality. Although this is a preliminary research, it is possible to estimate from the findings, that the greatest importance in terms of the contribution to the quality of the curation process has the use of social media tools and the internal desire/motivation of the curator to acquire knowledge through the process. The goal of the successful students was to learn out from self-motivation and to try sharing their infosphere among their knowledge community in order to improve their learning.

6 CONCLUSIONS

We live in a world where three basic phenomena: Social Media, Personal Identity Online and Data Intensive Science has acquired great importance. Students have been suggested to act in an innovative learning environment based on the digital curation, one of the most innovative types of the social media that combines personalization and socialization of educational process. The proposed environment allows a student, by using the curation activity, to develop his own contemporary subject content, in other words, to develop a specific curriculum as a learning activity.

Our preliminary study allows concluding that all three of the mentioned above phenomena exist in the curation activity and can be identified in the way the students work. Moreover, we classified skills characterizing the Digital Curation process, which skills correspond to the three basic phenomena.

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