

Participatory Design of the Participatory Culture: Students' Projections of e-Learning 2.0

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Abstract. The participatory culture of Web 2.0 and the implicit empowerment of the learners have not been yet associated with participatory design projects that involve learners in the design and development of the new mediating tools. In this paper, we examine students' projections of Web 2.0 in higher education. Ninety seven undergraduate students participated in 20 design sessions exploiting two needs' elicitation techniques with the aim of envisioning of a course website that meets their learning particularities, that incorporates and exploits their new technological habits and which can be harmoniously situated in the daily routine of a modern, active student. 583 needs were produced and their abstract categorization is presented. Students proved that they had refined views about the elements that can render successful the next wave of e-learning applications and provided directions that can help designers and researchers in developing more informed designs. Students are the main agents of educational change and, hence, they deserve a more active and contributive role in the knowledge society.

Keywords: Web 2.0, elearning 2.0, participatory design, participatory culture, learning management systems.

1 Introduction

Only recently, formal research on Web 2.0 in higher education has started to get published and there is no evidence that the promised revolution has been unlocked. Relevant studies concentrate on specific technologies such as podcasts, tagging, blogs (e.g. [1],[2],[3]) while holistic approaches that embrace the pedagogy transformation, are either non-existent or rare. Simplistic hypotheses about the discrepancies between a slow and cumbersome university and the spontaneous and ever-evolving Web 2.0 [4], and between the stereotypical labeling of students as "digital natives" and the ascertained lack of the required computer literacy, call for a more thorough and systematic investigation of the emerging opportunities and alternatives, along with their requirements and effects.

The introduction of Web 2.0 technologies requires a significant shift in students' and learners' practices and, we should not forget that change is not an instantaneous

incident but a complex and subjective learning/unlearning process for all concerned [5]. A “culture shock or skills crisis” may take place when “old world” educators are forced to introduce novel approaches such as networking, blogging, podcasting, etc. with which they may lack experience and confidence [6]. Hence, a pragmatic e-learning 2.0 should be concerned not solely with affordances but also with the inter-crosses between stakeholders’ expectations, motivations and skills.

Interestingly, the participatory culture of Web 2.0 and the implicit empowerment of the learners have not been associated with participatory design projects that involve learners in the design and development of the new mediating tools. Students’ input, until recently, has been constrained to the evaluation of prototypes or priorities, and the assessment of satisfaction and attitudes and there are no studies focused in exposing their thoughts and desires from a design perspective. However, students do have high expectations of how learning should take place and which technologies and learning environments best meet their needs [7]. Given the dominance of constructivist and participatory approaches to learning, keeping students out of the design of the new educational platforms creates a paradox: while we seek active involvement in learning, we decrease students’ freedom to make decisions about their own learning [8].

Several participatory design methods involve students directly in the software development, based on the assumption that “as a result of their extensive experience with common educational tasks, [students] (1) are able to easily recall, state and elaborate on their prior problems and needs, (2) have unconsciously or deliberately thought of and formed solutions and proposals concerning those educational processes, (3) are willing to collaborate with their colleagues on engineering joint solutions to their problems and, consequently, (4) may produce numerous diverse ideas for the construction of prototypes in a short amount of time” [9]. Students’ willingness to lead a process of re-conceptualizing existing pedagogies in the light of new opportunities and engaging in the co-formulation of their future has been documented in several case studies [8, 9].

By adopting the view that educational transformation must involve the concerned stakeholders and not be imposed upon them, we aimed at eliciting students’ proposals for the design of an ideal course web-site. Our main objectives were to

- a) portray students’ notion of the “ideal course website”,
- b) reveal their projections of Web 2.0 in their learning,
- c) examine their suggestions and priorities concerning the required learning affordances,
- d) provide a more holistic student-initiated perspective of priorities and power relationships before bringing in questions about current pedagogies and institutions.

We believe that the resulting knowledge can help designers and researchers in their efforts to develop more informed designs, which will positively influence student engagement with learning and its outcomes.

2 Methodology

We followed the participatory design framework of the We!Design methodology [9] which designates that educational requirements can be extracted by conducting

iterations of concise and highly-structured collaborative design sessions with different students. The iterations ensure the representativeness of the students' needs while their short duration renders them attractive to many students without significantly disturbing their primary educational obligations. We conducted 20 sessions with the participation of 97 undergraduate students (41 male and 56 female) studying in a Greek Technological Educational Institution. Students were on the third or fourth year of study (with a mean age of 22.8 years old), fulfilled the methodology's requirements for intense computer experience, were engaged in social networking, and Web 2.0 technologies, and had extensive educational experience in tertiary courses and corresponding LMS. Hence, it was expected that they had refined predispositions towards the weaknesses and the opportunities of institutional e-learning services. Each design session lasted for approximately 2 hours and 30 minutes and was comprised of four to six students and two coordinators who guided the students throughout the design process and provided support when needed. The design sessions included two phases: the introductory phase and the needs' elicitation phase. Two different approaches were employed for the elicitation of students' needs. The first technique was applied in twelve sessions while the second was applied in eight sessions.

A video camera captured the design sessions' setting in order to provide a detailed documentation of the whole process. After each session, students were asked to evaluate the final list of needs in terms of the perceived significance for the learning process and their innovativeness in a 5-point Likert scale (1-5) and assess the design process and the coordinators influence. Students, in another context, also completed a computer experience questionnaire.

2.1 Introductory Phase

At the beginning, a detailed description of the design problem was presented, namely, the envisioning of a course website that meets students' learning particularities, that incorporates and exploits their new technological habits (e.g. social networking) and which can be harmoniously situated in the daily routine of a modern, active student. Students were then asked to play the role of a scriptwriter and develop their own fictional character – we use the term “design alter egos” – for whom they would be asked to create scenarios during the rest of the design process. The process started with the selection of a photograph from a set of photographs carefully collected from cultural magazines. The participants were then asked to shape their design alter ego's physiological, sociological and psychological traits through a process of introspection, recollection and organization of personal experiences, and, at the same time, reflection on other user's attitudes and characteristics, and document them using a detailed predesigned form. The characters should (a) refer to a student, preferably close to their age, with explicit learning interests and (b) be someone with whom they can either relate to or simply be able to talk about. When the students completed the creation of their design alter egos, they presented them to the rest of the group. The design alter ego concept was introduced in order to liberate students from the fear of straightforwardly exposing themselves and to offer a mediating artifact to think for and with.

2.2 Needs' Elicitation Technique I

Five sequential activities were conducted: (a) Students were provided with a set of textual and visual stimuli, in the form of nouns, verbs, questions and photographs regarding the diverse contexts where their design alter egos could spend time during the course of a day (e.g. “in the morning, in the afternoon, at night” or “alone, with my roommate” etc.), together with exemplary imagery that included photographs of a lecture room, a student’s room etc. They were then asked to create short scenarios in respect to the specified contexts and recall existing problems and needs. (b) In the next activity, students focused on their fictional character’s personality traits and behaviors, and searched for well-situated needs, directly linked back to their psychological characteristics. Relevant textual stimuli was provided (e.g. “When would she use her favorite motto while using the course website?” etc.). (c) Next, students were asked to situate their design alter ego in an advanced technology context. Textual stimuli in the form of questions (e.g. “What kind of opportunities do Web2.0 technologies offer in the design of the course website for your design alter ego?”) was provided. (d) Afterwards, students were asked to look for features or services that might be helpful in open-source or commercial LMS. A set of printouts depicting existing course websites were given to them. Students evaluated known solutions through their design alter ego’s perspective and incorporated them (or not) into the needs pool. (e) During the last activity, students were shown a 5-minute video comprised of segments from well-known Sci-Fi movies and were asked to envision the ways in which the educational system or the social scenery might change and how the new status quo could affect the requirements of the corresponding course website.

2.3 Needs' Elicitation Technique II

The second approach was structured as a board game. The main elements of the game were a round board, pawns and dices, one for each participating student. The board was divided in 20 slices, each one accompanied by a description card. Each slice referred to different exploration activity designated to assist students in creating scenarios. Students were given points whenever they managed to fulfill what was asked of them and the number of points related to the number of needs they recorded. The slices were organized in seven categories: (1) *The learning category* (4 positions) which provided different sets of verbs (e.g. learn, understand, explain etc.) and nouns (e.g. lecture, assessment etc.) extracted from learning theory books and aiming at reinforcing the essence of learning. (2) *The time category* (3 positions), which presented to the students different periods of time in design alter ego’s daily routine: morning, afternoon and night. (3) *The context category* (3 positions), which provided images of three distinct contexts where their agent might live: school/university, home-students’ rooms, recreational spaces (coffee shops, clubs, etc.). (4) *The technology category* (3 positions), which asked students to envision the ways in which upcoming technological innovations could affect their design-alter-ego’s needs. The cards presented either verbs (e.g. change, foresee, imagine etc.) or questions regarding the use of novel technology products in the classroom (e.g. Tablet PCs, interactive whiteboards etc.). (5) *The divergent category* (2 positions) consisted of two creativity techniques. The first one asked students to imagine that the course website was

replaced by a human agent and then try to think of ways in which this agent would act to fulfill their design alter ego's needs and requirements. The second technique was similar but students were asked to imagine that the course website was transferred to another medium such as cinema, theater, radio etc. (6) *The existing solutions category* (2 positions) in which existing LMS were presented. (7) *The extras category* (3 positions) which allowed students to use cards from whichever category they wanted while being rewarded double points for each scenario proposed.

In both techniques, students, after being presented with the tasks, thought alone at first and presented and discussed their scenarios afterwards elaborating their view on their significance.

3 Results

3.1 Students and the Process

The participants could be considered as a representative sample of computer literate students since they used computers for an average of 5 hours per day, shared equally this time between academic work and personal interests and have been using computers for 6,52 years. Their most frequent computer tasks were listening to music, e-mailing, social networking, synchronous communication with their friends (text-voice), seeking for entertainment material (YouTube, etc.), watching movies, reading news on the internet, searching for consumer goods and playing games.

Students were excited with their participation and evaluated very positively both the products of the design sessions and the process. They characterized the resulting needs of their session as “innovative”, “interesting”, and “complete” and the design process as “satisfying”, “unexpectedly enjoyable”, and “efficient”. They also underlined the friendly, collaborative and creative atmosphere that prevailed throughout the sessions. Without any significant statistical differences in the perceived satisfaction and effectiveness, the two different techniques produced similar needs that converged to the categories analyzed later in the paper.

3.2 Needs

Students produced 583 distinct needs (duplicates in each session were removed). The suggested needs were initially organized based on their content, and similar needs were grouped and rephrased in order to form a set of discrete categories. These categories are presented in Table 1. The columns correspond to the total number of proposed needs, the percentage of needs in each category that were considered to be innovative (their mean assessment was greater than 4), and the mean perceived significance of the needs in each category.

Course Syllabus: Students underlined the need for a better contextualization of the domain into their world, their professional and academic ambitions. They asked for the integration of the course description with further educational prospects (post-graduate studies, opportunities for diploma theses, etc.), artistic work (films, literature, etc.) which could stimulate the pursuit of the philosophical roots and pragmatic consequences of the subject matter, and with a detailed portrayal of the skills they

would acquire (even showing videos of workers practicing in industry or other institutions). Two non-typical needs were identified: an estimated study load chart, namely, an informal calendar of the anticipated load of students during the semester in order to be able to better organize their priorities; and a frequent strategic learning mistakes list which could help them avoid common misunderstandings. Students seemed to look for informal views and empirical hints from their professors that could inform their decision making processes.

Table 1. List of proposed needs

<i>Needs Categories</i>	<i>#</i>	<i>I</i>	<i>S</i>
Course Description	44	23%	3,85
News and Updates	59	19%	4,02
Communication	59	41%	3,99
Content Delivery	173	52%	3,89
Participation	28	43%	3,75
Networking	46	49%	3,51
Projects	58	33%	3,96
Exams	24	37%	4,38
Course assessment	14	36%	4,00
Usability	65	42%	3,69
Entertainment	6	17%	2,21
Secretarial integration	7	29%	4,03
<i>Total</i>	<i>583</i>	<i>40%</i>	<i>3,9</i>

News and Updates: Students suggested typical news and updates services including information feeds in the form of emails, SMS and RSS. However, the most unanticipated requirement was the pursue of a wider variety of information services; students considered as self-evident that the course website should function as an informational portal for the subject matter by providing industry and research news (extra-curricular info about developments, discoveries, new software, press releases, etc.), political and environmental news (new laws, policies, research roadmaps) and related activities that take place in the academic environment or the city they live (seminars, conferences, lectures, competitions). Students essentially asked for the opportunity to scent the idiosyncratic characteristics of the domain through information services that could give them more chances for participation and learning.

Communication: Students proposed typical services of synchronous and asynchronous communication with their peers and their professors. The acknowledgement of others e-presence was requested in all sessions and for all stakeholders. They sought for a way of submitting public questions to the instructor in order to force him answer with immediacy and developing an open knowledge base. They wanted to exploit the transparency of the medium in order to render it as a regulative channel that binds teachers and learners.

Contents and presentation: This category gathered the majority of students' needs (31% of the total needs), providing validation of the high value students attribute to online learning resources. More specifically:

A) They proposed live broadcasting of lectures and the provision of the respective recorded versions. They also asked for podcasts which could be played offline when

walking or exercising. In two sessions, the format of documentaries was suggested as an intriguing form of presenting the learning material.

B) They asked for two types of summaries, one which should describe the issues that would be discussed in upcoming lectures, and one which should address the key elements of each prior lecture. Multiple formats were proposed for these summaries as well (e.g. textual, podcasts, vodcasts etc.).

C) They requested extensive supportive material for each lecture. They mostly referred to video-presentations from the workplace (e.g. for an instructional theory course, students asked for video recordings of classroom lessons that convey the studied concepts). They even asked for live connections and teleconferencing with corporations, industries, schools, etc.

D) They pinpointed the value of practicing the acquired knowledge through simulation and modeling software. They envisioned electrical circuit simulators or instructional planners and seemed puzzled about their absence in existing websites. Game-like simulations were also discussed in combination with rewards system for the students with the best performances.

E) They requested historic/background information for the subject domain, its evolution, and its projections in the future, along with information about the most important figures that determined its development. A similar proposal concerned the presentation of videos in the form of “as today”.

F) They underlined the significance of study material beyond the scope of the course that could support those who might want to tackle more with the topic (literature, instructions, links, articles, advanced projects and cases).

G) Students acknowledged that most subject domains demand the use of one or more software applications. Hence, they asked for a space dedicated to alternative software, guidelines and updates. They acknowledged that the process of learning about software is one of the most complicate problems they confront every day.

H) They asked for psychometric and learning style questionnaires which could help them detect by themselves their unique characteristics and develop their study strategies.

I) Finally, they proposed the creation of a dictionary in the form of a wiki that could prove to be a valuable source for peer-to-peer learning.

E) Course co-formulation: Students were willing to create shareable resources such as class notes, bookmarks, and links to relative articles. Additionally, they asserted a role in shaping the course by selecting and voting their preferred way of teaching, taking the responsibility to provide a topic of interest as the theme of a lecture that would be elaborated by the instructor, organizing mentoring sessions with the teacher or ex-colleagues, initiating extracurricular student projects relevant to the domain with no control from the instructor, and finally, by voting on student initiated requests, such as the change of the exams dates. Students did not want to control or direct the core of the learning process but asked for further opportunities for involvement and participation in the decision making processes.

F) Course networking: Students anticipated multiple networking opportunities. They wanted the web course site to belong in a network of similar courses of different universities, a network with explicit possibilities for sharing resources and which could exceed the existing organizational and computational infrastructures. They expected a

variety of video presentations, notes and cases studies coming from different instructors, search services that index all relevant resources, and plentiful and innovative communication/cooperation opportunities. They claimed that the opportunity to communicate with other professors seemed especially attractive.

They also asked for extensive networking opportunities with professionals as sources of authentic information. Students exhibited a genuine interest about the respective labor market, and proposed the offering of employment ads relative to the course domain, as a way of gaining a deeper understanding of the labor market orientations and assessing the contents of the course from a different perspective.

Students asked for the integration of their identity in existing social networking sites, such as Facebook®, with their course profile as a mechanism for familiarizing with their fellow students. Students alternatively suggested the creation of local social networks in course level, with the presentation of personal information for each student and feedback about his behavior on the website. Students wanted to socialize more with their colleagues in a way similar to that exploited in existing social networks. They asked for similar networking opportunities with ex-students who had successfully attended the course or even graduated from the department, so as to discuss and share their views about the value of the course knowledge.

They were interested to learn more about their instructors asking for their biography, their close associates, their publications, and so on. In a way, they were asking to become their friends and exceed the prescribed walls of formality inherent in their relationship. Many of them had already requested to become friends with those professors who had active accounts in social networking sites.

G) Projects: Students extracted needs related to the typical tasks of managing projects, and put emphasis in the creation of a project pool. Some students asked for personal video presentation of the projects so as to make them more personal and attractive. Many needs concerned group work which, according to students, should be better supported by integrated project workspaces. They wanted to have the choice to manage their groups' synthesis and illustrated a tool which could enable them to select teammates from an available "market". They hinted that their social relationships do not allow them to participate in teams as flexibly as they wished.

H) Exams: The students stressed the importance of a question bank with exemplary answers. They expected to view electronically their grades and to study teacher's feedback on their answers in order to learn from their mistakes. They also wanted to be able to start an e-argumentation in case of dispute.

I) Course assessment: Students wanted to be able to evaluate both the instructor and the course. They differentiated their approach by proposing informal evaluations during the semester which would have a direct effect on the course's progression. Other forms of evaluation proposed included a regular column of complaints, a form for improvements suggestions, and an anonymous blog devoted to assessment. Students also asked for the establishment of an online session dedicated to discussions about the course and proposals for its improvement. They wanted to be able to co-formulate the course and adapt it to their needs and interests. They also said that they were willing to video-record informal assessments which could be useful for other students before selecting the course.

K) Usability and HCI: Students asked for notifications of changes on the website content, for a customizable user interface, and accessibility tools for students with special needs. They emphasized the need for simplicity in the interface and criticized several usability issues of existing LMS. They indicated the need for a client application that could download automatically the website's learning material, allowing them to work offline while retaining the same web interface. Students also asked for mashup flexibility either in the form of incorporating a concise version of the course site to other portals or by providing the possibility of including mashups of other applications into the course website (such as email, news feeds etc.). The students pursued the unification of their information channels with the course's updates as a motivation for closer attendance of the corresponding activity. They also asked for a personal space which would host their profile pages, and proposed the implementation of a personal calendar and a notes folder.

4 Discussion

Students did not seem eager to challenge the dominant paradigm of Learning Management Systems, an observation which is in agreement with research results concerning Web 2.0 tools that appear to extent, rather to challenge, current pedagogies. Their proposals were in a close relation to the participatory culture [10] and pedagogy 2.0 [6] where there are greater opportunities to: (a) initiate and influence curriculum (they wanted to propose lecture subjects, organize mentoring sessions, negotiate procedures and learning directions, etc.), (b) produce and share learning material as authors (they were willing to initiate extracurricular projects, produce video-assessments for the course, share their projects, links, etc.), (c) connect to the world as a whole (they asked for networking opportunities with instructors, fellow students, professionals, other courses, students of the same course in different departments, professionals, labor market, existing social networking sites), and (d) create a community of practice among teachers, learners and professionals in order to familiarize with professional practices and exchange ideas, products and interests. They blamed the isolating experience of much text-based traditional education by asking for multiple forms of presenting the course contents [6] and focused on a better contextualization of all domain knowledge in real life.

However, overall students tried to avoid the initiative of learning. They did not emphasize self-direction and focused mainly on improving existing practices of self-studying pre-organized material. Despite the opposing references, they did not concentrate on learning experiences that are short and opportunistic. They kept their learning and personal spaces apart and did not challenge the role of the academic institution, nor its fundamental organization. Students pinpointed inter-university constellations as means towards improving dramatically the quality and the quantity of the courses' contents and the opportunities of networking. They attributed to the instructors the role of authoritative sources of information, a secure intermediate layer between them and the available web resources.

Our study demonstrated that students had refined views and ideas about the elements that can render successful the next wave of e-learning applications. Thus, it would be safe to claim that the participatory culture of e-learning 2.0 must be

combined with participatory efforts for co-designing its characteristics with the students, in an open, democratic, empowering atmosphere that can also address change management prerequisites. Students' visions of education either concerning an LMS, a note-taking tool or an assessment application are fundamental for the harmonious integration and exploitation of educational technology in everyday learners' life. Students deserve a more active role in co-formulating their future in a truly participative knowledge society which promotes contribution and involvement, highlights change management and not abrupt interventions and comes in opposition to homogenization and passivity of the learners and learning environments [8].

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