

Challenges of ‘Students as Producers’ in web 2.0: A reflective account

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Abstract: In reaction to recent calls for Higher Education institutions to invite students to shape and manage their own educational experiences (McLoughlin & Lee, 2007, 2008), increasing numbers of initiatives are engaging students as partners and co-producers of curriculum content. Positioning students as co-producers has great potential to enable them to innovate, share and form communities of interest and networks (Boyd, 2007). Despite enthusiasm for the use of participatory pedagogies, there is little research to show that educational practice is undergoing transformational changes due to these emerging trends (Crook et al., 2008). This article draws on qualitative interviewing to explore the experiences of students involved in Pedagogy 2.0 at a UK university. This was in the form of students creating multimedia content to be shared with peers. Findings suggest that alongside the pedagogical and technological components to be considered, additional monitoring of student attitude and motivation to use Web 2.0 tools for educational purposes is required. The paper also provides suggestions that may help teachers who plan to use similar pedagogies in their classroom.

I. Introduction.

Higher Education (HE) has been undergoing a paradigm shift away from teacher-centered instruction to student-centered learning (Laurillard, 2002) whereby learners construct knowledge for themselves and take more active roles in shaping and leading their own educational experiences (Holmes, Tangney, FitzGibbon, Savage, & Meehan, 2001). Increasingly, universities have started to engage their students as partners in contributing to curriculum design, delivery of learning resources, and researching different aspects of learning and teaching (e.g., Birmingham City University, Students as Academic Partners; University of Exeter, Students as Change Agents; University of Lincoln, Student as Producer). Such initiatives embody the view of learning as knowledge creation (Paavola & Hakkarainen, 2005), which contends that students benefit greatly from constructing knowledge for themselves, for each other, and for subsequent groups of students as a result of interacting with the learning environment and with their peers (Holmes et al., 2001; Neary & Winn, 2009). By becoming partners in creating learning environments, students are able to gain valuable graduate attributes and capabilities that may prepare them for careers and lifelong learning (Committee of Inquiry, 2009). These initiatives seem to influence positively the student experience, culture, and nature of the relationship

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between students and the academic community within which they learn (McLoughlin & Lee, 2008).

Responding to calls for creating student-centered learning environments, many educators harness Web 2.0 applications to empower learners to take more control of their learning processes through producing content for their learning community and exposing learning materials for re-use by others (Anderson, 2007; Cochrane, 2010). For the purpose of this paper, Web 2.0 is defined as an emerging set of web-based communication tools such as web-based communities, hosted services, web applications, social-networking sites, video-sharing sites, wikis, and blogs (Cappelletti, 2010). The appropriation of these pedagogies in online environments has been termed Pedagogy 2.0, which incorporates various networks and resources individuals engage with during knowledge construction, sharing understanding and contributing to joint knowledge creation (McLoughlin et al., 2007).

Despite enthusiasm for the use of Pedagogy 2.0, there is little evidence that educational practice is truly undergoing transformation due to the use of these participatory pedagogies (Crook et al., 2008; Hamid, Chang, & Kurnia, 2009; Kim, Hong, Bonk, & Lim, 2011; Palaigeorgiou, Triantafyllakos, & Tsinakos, 2011). In his critical review, Selwyn (2007) cautions that more careful consideration and rigorous research are required when adopting Web 2.0 technologies in educational settings. Other evidence suggests that the intersection of digital technology and education can be marked by a myriad of issues and tensions (Anderson, 2007; Cochrane, 2010), which is the major focus of the present paper.

II. Literature Review.

Pedagogy 2.0 is seen to hold great potential to transform classrooms into “interactive, participatory, adapting, living organisms of learning and generating content” (Rosen & Nelson, 2008, p.222). Recent contributions to the development of Pedagogy 2.0 have suggested that new learning environments are in line with the view of learning as knowledge creation (McLoughlin & Lee, 2007, 2008). The key concept is that Pedagogy 2.0 provides venues for connections between ideas, learners, communities, and information networks, supported by online environments tailored to learners’ personal needs and goals (Cappelletti, 2010). Accordingly, students can easily create multimedia content, share information, and contribute individually and in groups to collective intelligence (McLoughlin & Lee, 2008; Cochrane, 2010). This view of learning claims that students progress significantly more when working cooperatively and sharing ideas with others than when working in isolation (Vygotsky, 1978). For example, social interaction can lead to advanced cognitive development and promote higher academic achievement than individual learning activities (Johnson & Johnson, 1991). As a result of these new learning environments, a new “prod-user” identity (Brown, 2010) is emerging, characterizing students as co-producers of knowledge rather than merely consumers of information.

Despite growing enthusiasm for new technologies in HE, existing empirical evidence of the implementation of Pedagogy 2.0 is ambiguous. On the one hand, literature suggests generally positive results about students’ perceptions and enjoyment of using Web 2.0 tools in learning. With their integration into assessment, students valued the digital technology beyond the novelty factor (Lee, Chan, & McLoughlin, 2006; Cochrane, 2005, 2010). These studies claim that students gain a better understanding of subject knowledge and develop transferable skills while using Web 2.0 tools. On the other hand, there is evidence of rather mediocre and compromised

use of Web 2.0 tools (Gouseti, 2010). For instance, some studies (Cann, Calvert, Masse, & Moffat, 2006; Cole, 2009; Kerawalla, Minocha, Kirkup, & Conole, 2009) reported that using digital technology as part of subject assessment was not generally popular with or well-received by students. Authors cited a number of factors explaining the low engagement with Web 2.0 applications: mismatch with student expectations; heavily loaded timetable; extent to which student groups were integrated into the overall structure of academic courses; unattractive course design; insufficient support provision. As such, the implementation of Pedagogy 2.0 in formal education is not always successful and occasionally, fails to generate active student participation.

The literature review on the use of Web 2.0 in education has identified a range of issues and tensions in Pedagogy 2.0 classrooms. One key problem is limited knowledge some educators have about Web 2.0 (Grosbeck, 2009). A wide number of educators remain skeptical or disapproving of Web 2.0 implementations (Gouseti, 2010). Some writers go as far as to question the ideology of Web 2.0 which they claim has not been seriously evaluated, resulting in the failure of Pedagogy 2.0 (Williamson, 2009). Generally, Pedagogy 2.0 is considered to be insufficiently understood and valued by educators, and is perceived as too difficult to implement in education (Cochrane, 2010) due to the lack of clear solutions to well-understood problems (Ravenscroft, 2009).

Another aspect that appears to influence the successful implementation of Web 2.0 tools is the level of students' digital literacy skills needed to operate in an online environment (Rosen & Nelson, 2008; Beetham, McGill, & Littlejohn, 2009). Recent research has cautioned against Prensky's (2001) premise of 'digital natives' that today's learners are comfortable using Web 2.0 applications (Kennedy et al., 2007; Crook et al., 2008; Rosen & Nelson, 2008). Not all students seem to be as familiar with contemporary technology as is commonly believed (Rosen & Nelson, 2008), with few students employing Web 2.0 for content creation. Furthermore, evidence suggests that students proficient with video games, internet, and mobile phones did not readily transfer these digital skills to other applications to support their learning (Rosen & Nelson, 2008; Grosbeck, 2009). Accordingly, students seem to draw a distinctive line between fun and study, a view challenging those who assume that students learn through the same devices as those that entertain them (Hurlburt, 2008). Additionally, research shows that many students appear to lack the competence to navigate, locate authoritative sources of information, and select relevant sources from the abundance of information available (Windham, 2005; Katz & Macklin, 2007).

Another challenge to the uptake of Pedagogy 2.0 is the artificial social environment that some Web 2.0 tools (e.g. class blogosphere, online boards) entail. Although these applications allow students to interact and provide feedback for each other, Hurlburt (2008) argues that it does not follow that students will actively engage in sharing, commenting, and collaboration. She suggests that these environments do not share the spontaneous nature of other social networking applications, seriously undermining student engagement. Moreover, issues such as trust, quality, and safety, related to online settings seem to be crucial to the integration of Web 2.0 tools (Selwyn, 2006; Brown, 2010). Neglect of these important aspects was shown to make learners feel uncomfortable and reluctant to post their thoughts and comments on student-produced multimedia content (Hurlburt, 2008). Equally important is the assessment dimension; attempts to create active learning environments mediated by technology can fail when coursework is not closely aligned with assessment and does not count towards the final grade (Cann et al., 2006; Cochrane, 2010).

As suggested, Pedagogy 2.0 classrooms can be volatile and challenging environments (Hemmi, Bayne, & Land, 2009) due to a range of issues and tensions. Questions arise as to

whether the implementation of Pedagogy 2.0 is worth the effort. This paper is concerned with a research project the aim of which was to establish the ways and extent to which the process of involving students as producers of multimedia curriculum content enhanced their understanding of subject knowledge and broader life skills. We describe phase one of the project which sought to identify benefits and challenges experienced by four practitioners and their students of using Web 2.0 tools to create multimedia curriculum content, leading to tentative recommendations for future implementations of Pedagogy 2.0 in phase two of this study.

III. Methodology.

A. Background and participants.

This paper is based on the work of four lecturers who incorporated digital technology into their curriculum designs. The mini-studies were conducted with students previously enrolled on Computing, Accounting and Early Childhood Studies (ECS) at Plymouth University. The lecturers undertook a number of mini-studies during the academic year 2010/11, each concerned with past implementations of Pedagogy 2.0 in a different subject discipline. The aim of this project was twofold. On the one hand, lecturers intended to explore students' experiences of producing multimedia curriculum content as part of their learning. On the other hand, the emerging findings of these interdisciplinary mini-studies were fed forward into a larger-scale project on Pedagogy 2.0 in the following academic year. All four subjects included some form of Pedagogy 2.0 but varied in terms of structure, assessment, and type of exercises used for producing multimedia content.

Second year students enrolled on ECS were invited to attend a one-week study trip to the Gambia, which was a voluntary component of their course. As not all students were able to participate, staff members proposed creating a blog and resource portal where students could upload reflections gathered whilst on the study trip to be shared with the wider student body. Students were offered the choice of using either flip cameras, dictaphones or keeping a journal/diary to document their experiences abroad. For the year under consideration, 15 students participated in the overseas placements.

The Computing curriculum included elements of face-to-face learning (e.g. seminars, practical sessions); eLearning, implemented via the Moodle Virtual Learning Environment (VLE); and project-based learning. Students developed the coursework based on a case study from a local industry partner. This coursework was assessed by the lecturer as well as by peers. The lecturer's assessment contributed 80% to the overall grade, the peer assessment the remaining 20%. Pedagogical principles which underpinned the delivery of the subject were derived from social and communal constructivism (Vygotsky, 1978; Holmes et al., 2001) with elements of chaotic learning, i.e. learning which is playful, exploratory, collaborative and non-linear (Schoenborn & Rees, in press). Fifty 2nd-year students had to develop an I.T. model for an industry contact who was actively involved in the delivery of the subject. Students were required to conduct independent research and group work, create content in the form of wikis uploaded to the Moodle VLE, and run seminars for each other. The lecturer provided substantial support and continuous formative feedback on overall structure and resources.

Finally, one hundred and seventeen 2nd-year students on the Accounting course were asked to produce wikis and podcasts as part of their coursework assessment. The podcast assignment required students to work in pairs, creating a three-minute podcast designed as a

revision resource. Wikis were used in two assignments. In the first, student groups of four created a wiki page and presented this resource to the whole class. In the second, students used a wiki to work collaboratively on a chosen topic. This activity involved a peer assessment exercise with students reviewing work on the wiki pages and providing feedback on each other's work via the wiki.

B. Data Collection Procedures.

The mini-studies examined a number of previous evaluations of student satisfaction with curriculum design and more specifically, with the exercises of producing multimedia curriculum content. Furthermore, primary data was collected by a qualitative interviewing technique to explore students' perceptions of using Web 2.0 tools, and challenges they encountered while producing multimedia content. This paper mainly focuses on the experiences of students-as-producers, elicited through qualitative interviewing. Some of the data emerging from the evaluations of student satisfaction are discussed elsewhere (Schoenborn & Rees, in press). The rationale for using interviews is based on their potential for collecting rich data on participants' perceptions, attitudes, and the meanings that underpin their lives and behaviors (Gray, 2004). Kvale (2007, p.7) states that the "interview is a construction site for knowledge," which enabled interviewers to capture students' views and experiences of producing multimedia content and to identify the issues and challenges students had encountered. The one-hour semi-structured interviews focused on discussing what helped or didn't help students to produce the multimedia content. The themes explored through open questions were forms of assessment; the process of learning; the technology; and areas for improvement.

An invitation to participate in interviews was circulated to all students after submission of the module assignments and completion of the course. The timing of this may partly explain the low response rate as many students had already left the campus and might not have had access to their university emails. Altogether, five students volunteered across three subjects: two from Accounting, two from ECS, one from Computing. While the small sample size represents a limitation of this study, being unrepresentative of the student population, the key aim was to explore the experiences of individual students and to gather first-hand accounts, making this a useful exploratory study. By referring extensively to the pedagogical theory (e.g., Vygotsky, 1978; Laurillard, 2002; McLoughlin & Lee, 2008), we endeavored to generate important discussions around Pedagogy 2.0 and to derive practical ideas for enhancing teaching and learning in the Pedagogy 2.0 classroom.

C. Data Analysis.

All recordings were fully transcribed and analyzed using NVivo software. To ensure anonymity, pseudonyms were used. Thematic content analysis was employed to analyze interview transcripts. From this perspective, the textual data was coded and rearranged into topics that were progressively integrated into higher order themes, via processes of de-contextualization and re-contextualization (Howitt & Cramer, 2007). The emerging themes were then applied to all the interview texts in order to classify and compare the important themes and to make inferences (Merriam, 1998).

IV. Findings and Discussion.

Findings suggest that students derived a number of affective, social, and cognitive benefits from producing multimedia content. Data capturing the perceived affective benefits include: experience of “enjoyment” and “satisfaction” with producing wikis, podcasts and/or audio content.

I really enjoyed the fact that there were small amounts of assessments constantly and especially in term one all the quizzes and homework I really enjoyed the online learning.
(Alexandra, Accounting)

Alexandra explained that producing “quizzes, the online tasks, the wikis” “all ma[de] it more interesting rather than being talked to for an hour”. Henry (Computing) indicated that the assignments provided him with great opportunities for taking control over his learning and re-using the student-produced resources.

He also emphasized that producing multimedia content might have “helped everybody” and instilled “a sense of accomplishment” into students. These students clearly appear to enjoy adopting the role of co-producer of curriculum content, which was a novel, enjoyable and rewarding experience. These and similar findings from other studies (e.g., Lee et al., 2006; Cochrane, 2010) suggest that Pedagogy 2.0 can have positive effects on the motivation of learners and is worth considering.

However, data encompassing the affective dimensions of learning suggests that using Web 2.0 tools to produce curriculum content can be fraught with apprehension and animosity. Anecdotal evidence indicates that not all students favor participatory approaches to teaching and learning. For instance, Henry (Computing) noted that his colleagues seemed to prefer the transmission approaches to participatory pedagogies, which might have affected the effort and time these students had invested in the completion of the given tasks. According to Henry, some students believed that they “shouldn’t have to go out and produce the course materials. The course materials should be given to [them].” Besides, students taking Accounting regarded lecturers as the only trustworthy authority to provide feedback and were reluctant to provide and receive peer feedback on student-produced multimedia content. As one student put it:

I think that if I was to be paying nearly seven thousand pounds in fees I don’t expect someone else paying seven thousand pounds in fees to be assessing me. I would want the University to be doing that. (Alexandra, Accounting)

Comments like “shouldn’t the lecturer be the person marking” were made by these two students. Clearly, there remain students who expect lecturers to deliver all of the subject content and provide credible feedback on their academic performance.

Despite the overall enjoyment of using digital technology in learning, instances remain of students enrolled on these programs being apprehensive about using some of the Web 2.0 tools. For instance, students taking ECS appeared to be reluctant to use digital technology to record and share their learning experiences from overseas placements. Of fifteen students, six used the flip-cameras, only two returning the footage, compromising the development of multimedia resources (Campbell-Barr, Huggins, & Wheeler, 2011). Furthermore, findings suggest that students don’t always recognize the value of using specific Web 2.0 applications in learning. For instance, Alexandra reported that while producing the wikis was beneficial to her learning, producing the podcast did not help her with understanding the subject topics. Likewise, John spoke of creating podcasts as an entertaining exercise which required him “to speak into a microphone” rather than engaging with learning. Students seemingly displayed contrasting levels

of satisfaction with Web 2.0 applications. This is consistent with other studies (Cann et al., 2006; Cole, 2009) confirming that students do not always find the use of digital technology in learning worthwhile. Notwithstanding, levels of student engagement with Web 2.0 tools may also be attributed to reasons such as poorly designed courses and associated support (Cole, 2009).

This study produced some encouraging evidence for those practitioners who use or plan to implement Pedagogy 2.0 in their courses. As the semester progressed, some students started to recognize the value of the participatory activities and came to appreciate them by the end of the academic year. This was due to students' increasing understanding of the benefits and alignment with the assessments.

We just did it [podcasts] to tick a box probably. To be fair even though it still forced us to do some research, but because it's like general information, we didn't believe this will be needed in the exam. [...] We were saying was useful in the end (John, Accounting).

This resonates with findings emerging from evaluation forms given to students enrolled on Computing, which suggested that a larger number of students expressed satisfaction with the course design at the end of the year than at the outset of the program. As Trowler, Saunders, and Knight (2003) point out, change takes time and subtle persistence. Consistent with literature on student academic performance (Prosser & Trigwell, 1999; Ellis & Calvo, 2004), our study demonstrates that students' attitude, expectations and perceptions of Pedagogy 2.0 were crucial to its success. Student apprehension can affect their engagement with novel learning environments and academic performance. According to Selwyn (2007), it is crucial to enter into dialogue with students prior to implementing such innovations to avoid students' resentment of Web 2.0 technology. Other examples of good practice enhancing students' attitudes and motivation towards Web 2.0 tools will be presented in the next section.

Data conveying perceived social benefits highlight the opportunities Web 2.0 applications provide for networking, collaborating and collegial interactions. Students taking ECS reported enjoying working in pairs, which offered a constructive collaborative environment in which they were able to collaborate and fulfill the assignments successfully. Some students spoke of creating study groups to work collaboratively on other assignments so as they "would all try and learn together" (Alexandra, Accounting). This is in line with the findings that emerged from the evaluation forms completed by computing students, which showed that those students who provide positive responses about team work, also tend to provide more positive responses overall.

However, collaboration and co-production of knowledge in groups was no easy task; findings indicate that working in groups to produce multimedia content was one of the biggest challenges, occasionally undermining student engagement with Web 2.0 tools. Although literature shows that small-group work holds great potential to stimulate deeper engagement and learning with subject content through processes of interaction and situated actions (Vygotsky, 1978; Johnson, Johnson, & Smith, 1991; Light, Cox, & Calkins, 2009), not all five students were satisfied with this experience. For collaborative learning groups to be successful, students need to make a paradigm shift from the traditional model - students have often been conditioned since junior school to acquire knowledge from teachers who are considered as key transmitters of knowledge (Johnson & Johnson, 1991). Challenging elements of group work experienced by participants included: reconciliation of conflicting timetables, unequal distribution of roles and contribution, and conciliation of emerging tensions. Some students spoke of adopting authoritative approaches to working in groups to ensure that everyone eventually fulfilled their duties:

...it boiled down to me threatening him a month before the hand in “this goes up by the time I come back from x; otherwise, you’re in trouble.” (Henry, Computing)

Another problem experienced by students related to group dynamics. Some groups appeared to be unable to resolve their differences as they “didn’t get out of the storming phase and producing something actually became an issue for them” (Henry, Computing). Therefore, group dynamics was seen to affect the quality of the produced materials and respectively their academic performance.

I spoke to some of my course mates and they had different groups and apparently the combination of people within the group influenced their mark quite dramatically. (John, Accounting)

Equally important was group size. Students taking the Accounting course noted that the group size of four subverted the group dynamics and success. The distribution and quality of contribution in big groups was perceived as unequal, which generated a feeling of frustration and dissatisfaction. As Alexandra explained: “it was just a frustrating process and it felt like I was wasting a lot of my time fixing other people’s slackness”. These suggestions challenge the existing literature that argues that smaller groups of three or four are the optimal size, in which participants are guaranteed to have opportunity to contribute equally (Light et al., 2009) and avoid the free-rider phenomenon, in which one or two students contribute less to the task yet take credit for the work (Wang & Burton, 2010). Arguably these experiences may be considered as powerful stimuli to learning as students were exposed to different conflicts that needed addressing (Anderson & Boud, 1996), yet they were not always equipped to handle them. As a result of these apparent issues, three participants reported occasionally experiencing negative affective states such as frustration, disappointment, and decreased motivation. Comments like “most of the time I wanted to smack certain members of the group” and “for me it [group work] just didn’t work” were fairly common among participants. These negative emotions may have affected the collaboration activities and in turn led to differences in their perceptions of usefulness and actual use of Web 2.0 tools. Similarly to findings of the study by Naismith, Lee, and Pilkington (2011), this study found that groups working collaboratively on producing multimedia content were often ineffective, failing to generate collaborative actions. Although these issues are characteristic of other learning contexts, for Pedagogy 2.0 to work successfully, lecturers ought to address the nature of academic emotions students may experience when working in groups on producing multimedia content. Otherwise, intense negative emotions, like anxiety, frustration and insecurity may affect student learning and lead to lower performance (Astin, 1984).

Data capturing cognitive benefits suggest that all participants developed understanding of subject knowledge by gaining alternative perspectives on the main topics. Exercises in producing multimedia content helped some students to revise their work in preparation for final examinations.

This [wiki] was useful definitely because again it was part of the exam so we practiced a lot with it and we had to use some resources and we had to use some books like the best way of analyzing balance and the reports and yes it was good. (John, Accounting)

Findings also indicate that students acquired valuable technological skills. As it turned out, not all research participants were familiar with using digital technology to produce wikis and podcasts and operating flip-cameras. Only one student seemed to be comfortable with using these tools, stating that “technology [was] pretty straightforward, everybody can use it and everybody knows how to use it” (John, Accounting). Other students “were very reluctant to use

it [Web 2.0 tools] initially” (Jane, ECS). Jane and June (ECS) felt that not all students were fully aware of the flip-cameras’ functionality, which might have restricted their engagement with recording experiences during their placements abroad. Consequently, students less knowledgeable about digital technology learnt how to use them during the course supported by the lecturer and relevant documentation.

Furthermore, positioning students as producers and reviewers of each others’ content enabled them to enhance their critical thinking skills. For instance, as part of the Computing and Accounting study areas, students were required to provide feedback on some of the multimedia content. Thus, they articulated evaluative judgments about the quality of the learning materials, which led them to either re-use or discard resources in light of perceived quality. Similar comments to: “there was fourteen reports and if you see a poor piece of work you just take only a little bit of that” and “wiki you can prove quantity but there were gaps in the quality, there were holes” were articulated by several students.

Overall, our study reveals limited re-use of student-produced materials. In contrast to literature indicating re-use of learning materials as a distinguishing feature of Pedagogy 2.0, most students in this study reported only little re-use of content in their learning and/or in preparation for final examination. The data analysis suggests that the main barrier to re-using student-produced content was lack of trust in the quality of such content. The three students with access to student-produced materials were critical of its quality and “didn’t trust the input from the other students”, being concerned that “if [they] listened to other people and they’d done wrong” then they would have produced mediocre work. This seems an under-researched area, requiring further attention to identify ways to stimulate the re-use of student-produced curriculum content.

Another barrier to the re-use of student-produced materials was the timing of activities. For instance, Henry (Computing) believed that the assessment episodes of student-produced content were untimely, because “there were people who left everything to the end and that interfered with the other groups as they didn’t have access to their wiki stuff.” Students perceived the tasks of producing multimedia content as more effective when they aligned closely with the final examination. As one student explained:

That worked really well having it [wiki] where it was and I think if we had had it any earlier it would have been forgotten by the time you come to the exam, but in the exam it was almost... it was so fresh still. (Alexandra, Accounting)

In contrast, the tasks set up at the outset of the academic year were perceived as less influential for the preparation of the final assignment. Furthermore, the lack of navigational tools (interface) posed serious challenges when navigating through the sheer volume of documents. John felt overwhelmed: “I just sometimes thought, my goodness where do I have to start? At the end of the day you are just losing track.” Alexandra added: “It wasn’t flowing, it wasn’t you know it was all quite bitty and you had to jump between the report into the different sections and I found that quite frustrating.” This resonates with Naismith et al. (2011), who suggest that some students are unwilling to use wikis to design learning resources because of an insufficiently intuitive interface for linking files. These findings imply the necessity for a user-friendly approach to organizing the student-produced content to ensure that Web 2.0 tools encourage and facilitate student learning rather than puzzle them.

Our study shows therefore that the implementation of Pedagogy 2.0 can be a complex process holding both great benefits and challenges.

V. Implications for Pedagogy 2.0.

Regular research group meetings allowed lecturers to discuss and to explore their own observations and perceptions as well as previous evaluations of student satisfaction. Above results complemented with the lecturers' reflections on the overall process have important implications for Pedagogy 2.0. These suggestions are well substantiated by the literature on pedagogy in Higher Education and digital education (Vygotsky, 1978; Cochrane, 2010).

A. Reshaping students' attitude and motivation.

Our study argues for reshaping students' attitudes and perceptions of participatory pedagogies. Harnessing and incorporating Pedagogy 2.0 into HE requires a shift in the culture of students from being passive recipients of learning to active agents managing their own educational experiences. As other educationists (e.g., Vygotsky, 1978; Holmes et al., 2001; Laurillard, 2002), we believe that students need to develop a strong sense of responsibility for their own learning and regard their program as a collaborative venture with their teachers and peers. By positioning students as partners or co-producers in the delivery of education, students can gain skills valued by employers (e.g. digital skills, team work, communication, problem-solving skills) and a sense of accomplishment, whilst institutions can benefit from new perspectives and resources. This shift is possible only if students are supported throughout this process, gradually developing skills and strategies by providing appropriate assistance or 'scaffolding' to ensure they develop a sense of worth and trust in their abilities. This aligns with Vygotsky's thinking on the *zone of proximal development* (ZPD) and with Brown, Collins, and Duguid's (1989) *cognitive apprenticeship model* that proposes three distinctive stages "model," "coach," and "fade" to assist novices' learning.

Reshaping students' attitudes to and perceptions of participatory pedagogies is closely related to the level of motivation and academic emotions students experience in learning. Bruinsma (2004) states that apart from cognitive factors, motivation and emotion significantly influence educational outcomes. Students need to become aware of the importance of participatory tasks in order to generate positive emotional responses and produce valuable multimedia content. Students in this study, who saw value in creating content either because of the high-stakes (assessment) or task similarities to those in real-life professional situations, were more likely to invest effort and time in achieving the learning outcomes and, importantly, displayed satisfaction with this approach to learning. This study contends therefore that for Pedagogy 2.0 to be successful in formal education, great attention should be paid to methods for motivating and engaging students as co-producers of curriculum.

Possible ways to encourage this culture shift emerging from the study:

- Fostering a culture of collaboration and co-construction where students value each others' views;
- Illustrating the potential of participatory pedagogies by including views of alumni and industry;
- Transparent integration of participatory pedagogies into course criteria and assessment;
- Gradually increasing the extent of student involvement underpinned by continuous support and feedback (based on the principles of ZPD);
- Introducing students to Web 2.0 tools through the use of demos, guidelines,

- examples;
- Using an incentive system (e.g. competitions, award ceremonies, student conferences on outcomes and/or products);
 - Well-timed tasks and assessment episodes;
 - Using authentic tasks (e.g. case studies provided by industry contacts);
 - Providing guidelines and exemplars of previous years' student-produced multimedia content;
 - Modeling group work.

B. Strengthening the re-use of student-produced materials.

This study emphasizes the importance of encouraging students to re-use student-produced materials. Research participants tended not to re-use the produced resources in learning and in preparation for the final examination.

Further suggestions emerging from this study:

- Development of user-friendly navigation tools and interface;
- In-session opportunities for sharing student-produced content;
- Modeling the re-use of produced materials in learning;
- Regular feedback from lecturers and peers on the quality of student-produced materials;
- Use of social recommendation mechanisms (e.g. rating systems of uploaded information).

These recommendations add to the body of research (Collis & Moonen, 2008; Cochrane, 2010) exploring the critical success factors in incorporating Pedagogy 2.0 in teaching and learning.

VI. Conclusions.

This study suggests that students derived a series of benefits from engaging with Web 2.0 tools to create multimedia content. However, the active learning practices mediated by Web 2.0 tools were not without challenges and issues. There is a serious concern that 'techno-centric' assumptions could obscure the fact that many students may not be capable, willing, or entirely comfortable using Web 2.0 applications in their learning, as shown by the disappointing outcome of the experiments in the ECS course. It is imperative not to assume that the incorporation of digital technology supports the process of knowledge construction, sharing, understanding, and joint knowledge creation (McLoughlin et al., 2007) and automatically leads to active student engagement. Instructing students to produce multimedia content in an online environment may not in fact generate collaborative activities, active participation, understanding and re-use of learning resources. Essentially, the study calls for a judicious approach to implementing Pedagogy 2.0 if it is to be successful. Efforts should be made to introduce students to Web 2.0 tools and participatory pedagogies and to assist them through the process of creating and re-using learning resources with a focus on monitoring student attitude and motivation to use Web 2.0 tools for educational purposes.

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