

DEVELOPING A WEB 2.0 PEDAGOGY TO ENGAGE THE NET GENERATION LEARNER IN A COMMUNITY FOR LEARNING IN HIGHER EDUCATION

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Abstract The widespread availability of technologies, such as laptops and mobile phones, and the increasing adoption of Web 2.0 technologies (e.g. wiki, blogs and podcasts), suggests that Web 2.0 as a powerful educational tool has come of age, providing challenges as well as exciting opportunities to meet the individual needs of an increasingly diverse range of learners. Since this work began over five years ago, Web 2.0 technologies have been incorporated into institutional resources across different managed and virtual environments, and opportunities for funding across the HE sector has been made available in an effort to provide 'the best possible learning experience' for our students. This paper presents a Web 2.0 pedagogical model which is underpinned by social constructivism and the principles of 'good teaching and learning practice'. This model continues to be used across a number of subject disciplines in Higher Education. The model is presented and its impact on the learner experience over a number of years is measured. Evidence of the impact on the learning experience is provided from the results of a pre and post test questionnaire which was distributed prior to and shortly after application of the model. *The results indicate the technology's benefits and its barriers-to-use.* To test for significant differences in the questionnaire responses a Wilcoxon Signed- Rank test was performed. In addition, content analysis was carried out using the learners' own reflections as documented in their blogs, thus providing insights into the perception of their learning experience, and validating the findings from the pre- and post test questionnaire results. This paper will add to the debate on the learner experience using web 2.0 technologies, collaborative learning and assessment underpinned by social constructivist theory.

Introduction

The underlying conceptual framework is deeply rooted in educator's experiences of using a blended social constructivist approach; the blended approach combines technologies outside of the classroom with face-to-face class-based activities (Doolan, 2008). This blended approach brings together a rich educational experience based on a collection from readings on social constructivism as the foundation for the use of technology to support pedagogical practice developing a deep awareness and appreciation of what can happen when merging the two; leaving behind footprints in innovate educational practices. The social constructivist approach engages learners' collectively and collaboratively through assessed individual and group based learning activities to construct, and share knowledge through interactions (Vygotsky, 1978), and by forming relationships with others based upon the foundation that learning is a social activity (Wenger, 1997).

This study continues to be a work in progress with practice and findings presented over five years. In the first year of the study a wiki was used in practice to provide further opportunities for collaborative learning and assessment. Moreover, the building of a community of learning (Doolan, 2006; Paloff, & Pratt, 1999) whilst at the same time helping create a sense of belonging

to that community amongst second year learners studying on a computing course Following this the intention was to explore how best to accommodate our current learners who are technology savvy whilst at the same time support collaborative learning and assessment (Doolan, 2007). In each year of the study a wiki has been used to act a as catalyst for learners to share co-constructed resources during collaborative learning and assessment inter and intra groups. The design and practice remains deeply grounded in the social constructivist theory (Vygotsky, 1978).

This paper presents an overview of the statistical impact following the introduction at that time; of providing learner choice in using new emerging web 2.0 technologies: podcast (audio) and video (Jumpcut) in addition to the required use of a wiki. An overview of the findings from learner blogs is presented the qualitative data findings are explored in (Doolan, 2006 & 2007). As in previous years the rationale for use remained the same. Learners used Jumpcut a video editing tool to produce video and podcasts to produce audio recordings as outcomes from their collaborative based assessment activities. These in itself were not assessed rather were used in driving curriculum objectives in particular the assessed learning outcomes of knowledge and understanding of subject content.

In summary the audio and video was developed by the tutor and uploaded onto a wiki to provide support for learners whilst completing the core learning activity given the other learning activities were dependent on its completion. The assessed report consisted of solutions to five sets of learning activities and included: the core activity: eliciting and documenting requirements to build computer software. This was required to be completed as all other learning activities were dependent on its completion. The learning activities were set taking into consideration that active student engagement requires the chosen activities to be shared equally within and across a learner group whilst using a collaborative learning approach (Doolan, 2007; 2008; Doolan et al, 2006), with an emphasis on learning by doing and an emphasis on understanding and a deep approach to learning (Biggs, 2003). Moreover, the activities in this study were set to support the personalised learning concept (Doolan, 2008, DFES, 2005) and learner autonomy (DFES, 2005). Whilst at the same time empower learners to create their own dynamic learning environments, and create their own learning outcomes collaboratively. It was also important that learners take control of their own learning activities and be motivated to feel ownership for their learning whilst working and relating to others.

Therefore, the collaborative assessment activities were chosen specifically to be shared and jointly owned within each group and shared across groups. Learners were provided with different case studies intended to minimize the possibility of plagiarism whilst providing learners with a wealth of resources via the wiki at the same time nurturing a culture of resource sharing using the wiki. The case studies provided were intended to represent as near as possible a “real world” industrial experience (Kolb, 1984).

Pedagogical model

This section provides an overview of the pedagogical model developed over the past five years of this work. The **Social Learning and Assessment using Technology in Education (SLATE)** (Doolan, 2010) strategies used in this study extend the seven principles of good practice in undergraduate education as outlined in table 1 (Chickering and Gamson, 1987). The principles are as follows:

- | Principle | Good Practice |
|------------------|--|
| 1. | ...encourages contact between learners and faculty |
| 2. | ...develops reciprocity and cooperation among learners |
| 3. | ...uses active learning techniques |
| 4. | ...gives prompt feedback |
| 5. | ...emphasises time on task |
| 6. | ...communicates high expectations |
| 7. | ...respects diverse talents and ways of learning |

SLATE strategies	Principles
<i>Relationship with students and teaching philosophy ... Approach Taken...</i>	1, 2, 3, 4, 6, 7
<i>Encourage students to produce learning resources...</i>	2, 3, 4, 7
<i>Learning Activities / Tasks... Active Learner engagement Learner and Tutor generated content – deep learning approach</i>	2, 3, 4, 5,6,7
<i>Technology – co-author, collaborate... Structure-Public area open to all learners and private group areas</i>	2, 7
<i>Establishing the culture, Preparing students... Setting and communicating clear directions / expectations</i>	1, 2, 6, 7
<i>Communicating clear directions / expectations Clear boundaries i.e. trust, respect, share, scholarly practice...</i>	1, 2, 4, 7
<i>Supporting social presence, Nurturing student relationships</i>	1, 2, 6, 7

Table 1: SLATE strategies

The SLATE strategies provide a context for the tutor to consider both in the design and implementation process when introducing the use of technology such as a wiki, and podcast with learners, and identifies what this means in “good “practice when using the SLATE model (Doolan, 2010).

Questionnaire design

A Questionnaire comprised of 50 questions was used to gain an understanding of learner attitudes both before and after using technology including a wiki to support collaborative learning and collaborative assessment. The questionnaire was designed using an EDPAC form which

automates the process enabling an Optimal Mark Reader to read the data, which was then imported into Excel for analysis. This procedure was familiar to the tutor and learners in this study as this is the standard form used by the university to obtain student feedback at the end of each module.

Attitude was measured using a Likert scale and for each statement learners rate their attitude on a continuum from Strongly Agree, Agree, No View, to Disagree, or Strongly Disagree.

The statements were grouped together under headings as a series of questions in categories in sequence, each being concerned with a different category: Questions 1 – 8 related to population data and is not included in this study. Question 9 to 13 inclusive were categorised as “Group-work” to measure the experience of working collaboratively, Question 14 to 17 was categorized as, “Group-work Assessment” to measure the experience of working collaboratively whilst undertaking the collaborative assessment “Question 18 to 25 was categorized as “Learning Resources” was intended as an attitudinal measure to ascertain the impact of the learning resources provided by the tutor for example; the planning and preparation activities, the materials and templates provided etc. And the category “Wiki and StudyNet” relates to questions 26 to 42 and was intended to measure attitudes to the use a wiki farm linked to the institutional resources and finally “Collaborative Learning Technologies” related to the use for question 4 up to and including question 50.

The order of questions was based on the logic of the study and to aid respondents providing guidance for completion in addition to instructions included in the questionnaire to help in completing the total number of 50 questions.

The questionnaires were completed by respondents in a scheduled lecture where learners were provided with detailed instructions on an overhead slide on how to complete the questionnaire. In addition to the instructions provided in advance of the lecture and documented on the questionnaire. Learners were informed that they have the right to opt out of the research process at any stage. The approach of lecture completion was taken to avoid data contamination through copying, talking, or asking questions however; there is no guarantee that this was indeed the case.

Analysing the responses

In a repeated measures design, 60 students participating on the computing course of which 44 (73%) responded to both the pre test and post test questionnaires. However, on some occasions not all questions were answered and this n value is reflected in the individual results.

The questions were stated in the form of statements to which the student could reply in different degrees of agreement.

The responses A to E for each of the questions were coded as follows: A (“Strongly Agree”) = 4, B (“Agree”) = 2, C (“Neutral”) = 0, D (“Disagree”) = -2, E (“Strongly Disagree”) = -4.

The questions were classified as belonging to the categories “I. Group-work”(Q9 - 13), “II. Group-work Assessment” (Q14 - 17), “III. Learning Resources” Q18 - 25), “IV. Wiki and StudyNet” (Q26 - 42) and “V. Collaborative Learning technologies” (Q43-57).

Because of the ordinal measurement scale of the responses, a Wilcoxon Signed-Rank test was performed on the ordinal data for each of the 49 questions to determine whether or not there was a difference in response between the pre test and post test condition.

To establish significant differences in the frequency of replies between the response classes A – E, chi-square tests were carried out for each of the 50 questions. To ensure sufficiently occupied classes, A, B and D, E were lumped to form the classes “Agree” (A + B), “Neutral” (C) and “Disagree” (C + D).

Spearman Rank correlation tests were done (separately for pre- and post conditions) between the responses belonging to the same question category to find out which statements were regarded as equivalent by the subjects.

In view of the large number of tests, it should be noted that a number of significant results could have occurred by chance alone and care should be taken when interpreting such a large number of results. I therefore used an experiment-wise error rate of $\alpha = 0.001$ after Hochberg’s improved “Bonferroni” procedure (Hochberg, Y. 1988). In place of the customary significance level of 5%.

The results

The results of the Wilcoxon tests demonstrate although the majority of students 38 pre test responses, and 36 post test responses evoked significance differences in response frequency between “Agree”, “Neutral” and “Disagree” showing a clear bias towards “Agree”, the students changed their opinion after the collaborative working experience on the collaborative assessment whilst using technology only for four statements as follows:

Question 9: “I feel happy to work in group assignments” (Figure 1)

Results from pre and post test questionnaires showed a less positive attitude towards working in group assignments, following the group based assignment.

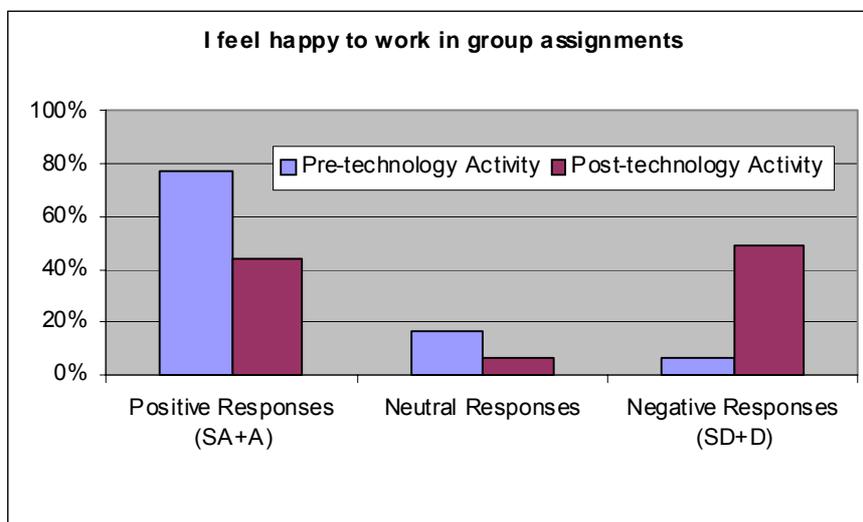


Figure 1. Distribution of responses to question 9 of the “Group-work” category.

Pre-test: $\chi^2 = 38.77$, $df = 2$, $p < 0.001$; Post-test: $\chi^2 = 13.58$, $df = 2$, $p = 0.001$

Question 31 “Being able to edit others work supported my learning” (Figure 2)

Participants had a more positive attitude towards being able to edit others work using the Wiki after using the social media for the group based assessment.

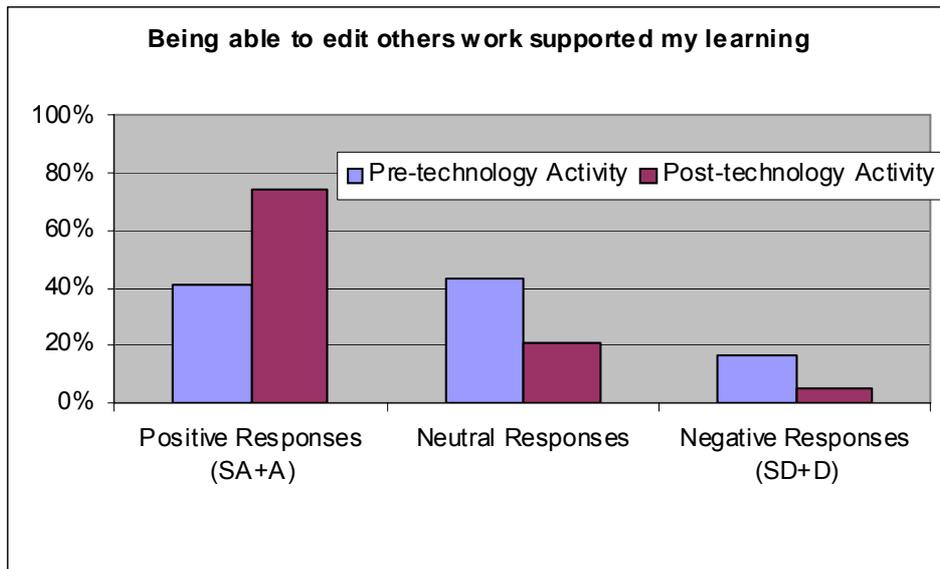


Figure 2. Distribution of responses to question 31 of the “Wiki and StudyNet” category.

Pre-test: $\chi^2 = 6.05$, $df = 2$, $p = 0.05$ (NS) ; Post-test: $\chi^2 = 34.37$, $df = 2$, $p < 0.001$

Question 35. “In the online learning environment I felt in control of my own learning” (Figure 3)

After the experience learners felt no longer in control of their learning however, they felt that online learning environment did help them to feel a sense of belonging to their individual group following the collaborative experience and the group based assessment.

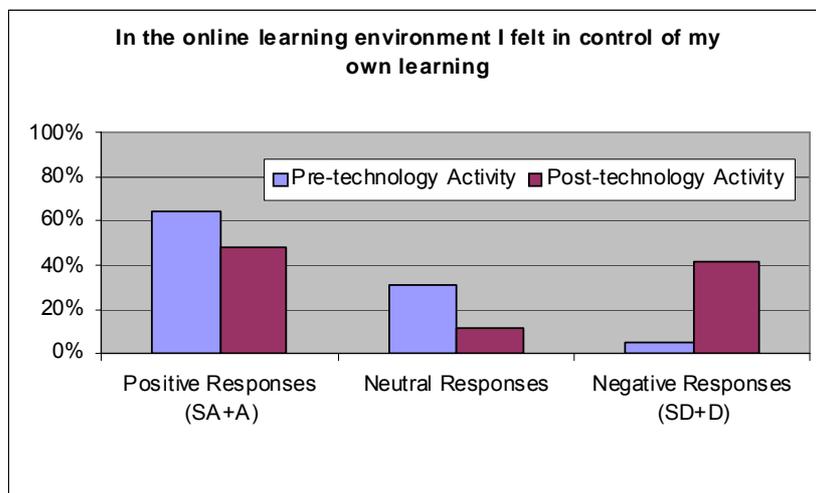


Figure 3. Distribution of responses to question 35 of the “Wiki and StudyNet” category.

Pre-test: $\chi^2 = 22.43$, $df = 2$, $p < 0.001$; Post-test: $\chi^2 = 9.86$, $df = 2$, $p = 0.007$ (NS)

Question 41. “I would like my tutor to intervene in my group work” (Figure 4)

Results from pre and post test questionnaires showed a less positive attitude towards the tutor intervening in their group work, following the group based assessment.

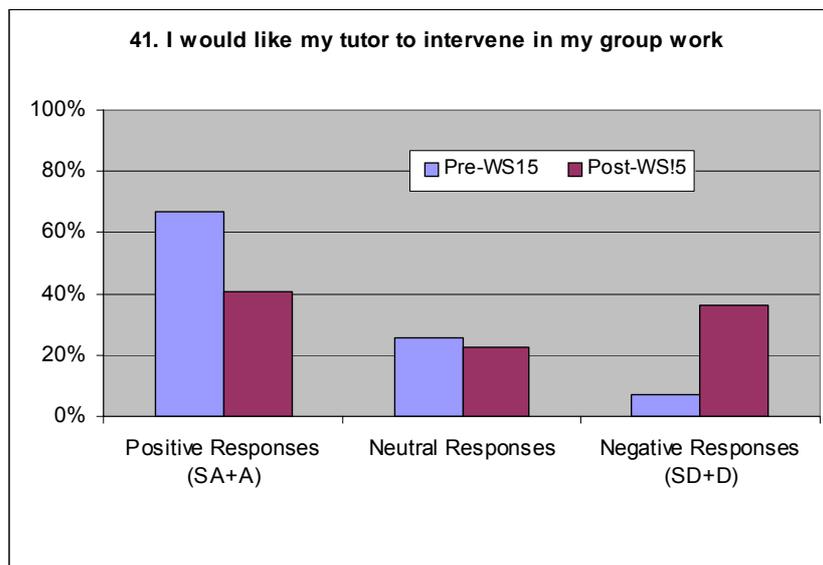


Figure 4. Distribution of responses to question 41 of the “Wiki and StudyNet” category.

Pre-test: $\chi^2 = 23.28$, $df = 2$, $p < 0.001$; Post-test: $\chi^2 = 2.36$, $df = 2$, $p = 0.31$ (NS)

Summary of findings

After using a wiki for collaborative learning and having completed the collaborative assessment learners were more positive after the experience than their perception prior to that experience. It was evident from the reflective blogs that learners valued the opportunity to structure their own learning. The wiki nurtured this as it has no fixed structure and provides pages that can be constructed and authored by any user; with access rights. The learners found the ability to structure and edit their peers was beneficial after the establishment of social rules and norms.

Learners were unhappy to work on group assignments following the collaborative learning and assessment experience which took place in groups of three and four. This may be correlated with the findings that significantly learners would like to see their tutor intervene in the group work. In the reflective blogs learners experienced problems with group members who failed to participate and contribute equally to the assessment. However, this was taken into consideration during the design of the learning activities in this study given that the half were required to be completed collaboratively the remainder; a group commitment and the reflective blog were individual assessed activities. It is evident from the blogs that learners failed to recognise this although it was clearly documented on the assignment specification in paper format and on the wiki.

There was an overwhelming majority of students who felt out of control of their learning having completed the collaborative learning and assessment activities using the web 2.0 technologies. This needs further exploration and alignment with other findings in the literature. However, the changes in the study this year and as presented in this paper provided students with the use of more technologies than in the previous year.

Although so far in-conclusive, initial evidence points to too much technology use and providing choice on a second year course may be problematic in learners engaged in collaborative learning and assessment and lead to learners' loss of control over their learning.

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University of Hertfordshire. In addition to, acting as a research assistant, consultant and undertaking a MSc in Computer Science.

Biography

Martina A. Doolan is a National Teaching Fellow, Institutional Teaching Fellow, Blended Learning associate and a Principal Lecturer at the University of Hertfordshire. Martina was awarded a National Teaching Fellowship 2007 for her work. Her current interests include and are not limited to: Web 2.0 Social Software, Group/Collaborative/Social learning and Assessment, curriculum design using Social Constructivist approaches to education.

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