

## Team Enhanced Creativity: An approach to Designing User-Centred Reusable Learning Objects

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This paper describes a case study that illustrates Team Enhanced Creativity (TEC), an approach to the design of high quality, interactive, multimedia reusable learning objects (RLOs). TEC was developed by the authors, who are based at the London Metropolitan University 'branch' of the UK's national Centre for Excellence in Teaching and Learning in Reusable Learning Objects (<http://www.rlo-cetl.ac.uk/>); London Metropolitan University is the lead site, in partnership with the Universities of Cambridge and Nottingham. Our approach is heavily influenced by approaches to user-centred and participative design. The TEC approach enables teaching staff, multimedia developers and students to become involved in an iterative and highly creative process of reusable learning object design, implementation and evaluation. In this paper we will, (i) outline the background problem related to TEC, (ii) describe 6 stages of TEC using examples of the RLOs that were developed and the evaluation data that was generated, and (iii) conclude by looking at the lessons learnt and by commenting on the wider applicability of TEC.

**Keywords:** Educational Multimedia, Learning objects and repositories, active & interactive learning, advanced uses of multimedia, user-centered design methodologies.

### Introduction

The Centre for Excellence in Teaching and Learning (CETL) in Reusable Learning Objects (<http://www.rlo-cetl.ac.uk/>) is being funded by HEFCE to develop a range of multimedia learning objects that can be stored in repositories, accessed over the Web, and integrated into course delivery. London Metropolitan University is the lead site, in partnership with the Universities of Cambridge and Nottingham.

This paper makes use of a case study to illustrate how the user can be put at the very centre of educational design activities. But why put learners or users at the centre of design? Well, we cannot assume that we know how to design systems (like RLOs) that match the cognitive capacities of users or indeed that align smoothly within the social and organisational settings in which the system will be used. Evidence that this is problematic can be seen in that many current implementations of technologies have not been successful because these factors have not been incorporated in their design [1]. More research is needed that attempts to better match systems development with user needs. With RLOs we have the added requirement of placing pedagogy at the heart of our concerns [2] and the need to deal with different types of users (students and teachers).

Team Enhanced Creativity (TEC) is an approach to the design of RLOs developed by the team. Our approach is partly based on Boyle's [3] notion of decoupling and cohesion but is also heavily influenced by notions of user-centered and participative design [4]. The TEC approach feeds into the wider CETL Development Methodology: 'An Agile method for developing reusable learning objects' by Boyle et al. [5]. Our approach to RLO development is heavily influenced by approaches to user-centred and participative design. This approach enables teaching staff, multimedia developers and students to become in-

volved in an iterative and highly creative process of reusable learning object design, implementation and evaluation.

The paper will (i) outline the background problems that led to the development of the TEC approach (ii) describe the TEC approach, (iii) illustrate the effectiveness of our approach through user evaluation data, and (iv) conclude by commenting on the wider applicability of TEC. Below we now provide a brief elaboration of important aspects of TEC.

### **Background problems that led to the development of the TEC approach**

London Metropolitan University expresses commitment to widening participation. This agenda can lead to challenges for those teaching a diverse student body. Around two-thirds of the students are mature learners, often with English as a second language. Having a high proportion of mature learners changes the typical learning dynamic, as the students very often attend for lectures only. The informal learning that takes place on a more residential campus where students are present for more of their time is missing at our University. Research by Pheiffer et al. [6] showed that by week eleven of their first semester, only 19% of year one students had joined a student society and only 44% had attended a social event at the University. The students experience financial hardship, and many are trying to combine full time study with nearly full time work, with an average of 15 working hours per week. The University has invested in providing open-access computer study suites, so that online materials that can be accessed by all students, not just those able to afford internet access. However, gate entry data (i.e. the physical access point to the university where students must present their swipe cards) indicates that many students attend University for their teaching only, and at the times students would want to access the computer study suites, peak hour pressure limits their access.

Our initial learning project with RLOs built on the redesign of a core module taken by all new business and marketing students, in essence a 'study skills' module. Students were based at two geographically separate locations, and due to a merger, staff at the different sites had very different experiences of teaching year one students, thus significant cultural and managerial differences existed within the department. Research on the previous student cohorts [6, 7] indicated that many of the students shared the characteristics of being unreflective, lacking motivation, being surface learners and unengaged with the learning process. Fear and a lack of self-confidence have a real impact on the student learning experience, and inhibit that learning. The unequal power relations of educational discourse can very easily reinforce negative self-perceptions [8]. Thus, the challenge was to design an interesting and innovative course, to support the classroom teaching and meet the learning needs of in excess of 1000 new students, and support staff across the department in delivering a high quality module, with a consistent student experience on both sites.

The course redesign looked to engage both staff and students in a more meaningful learning dialogue. In traditional campus based Universities it is recognised that one factor for student success is that students are physically present, and that therefore one way of encouraging student involvement is to attract them to spend more time on campus. Our students could not be expected to be on campus physically due to their multitude of commitments and the tight room resource of an inner city University, but it may be possible for them to engage with University life virtually. Collis & Moonen [9] explore the meaning of the term virtual as applied to University life, and within this paper, virtual applies in terms of mobility, where a student can stay at home (or another location of choice) to access materials.

The Quickstart project is the name given to the pre-RLO CETL project (<http://learning.londonmet.ac.uk/bssmquickstart>) that was developed as a series of online multi-media tasks, was designed to lead the student triads through the processes of familiarisation with the expectations of becoming an academic learner. The subsequent evaluation shows patterns of exceptional student

activity 24 hours a day, and also there is clear evidence of activity in the evening and at weekends, when teaching staff and IT rooms are not available on University premises. The field notes give a glimpse of the student experience where students are making friends, exploring a museum together and attending classes. The small group presentations, undertaken mid-semester were reported by staff to be of significantly better quality than those of previous intakes. Anxiety levels remain high for these students. The researcher and staff notice that “reassurance” is a key requirement from students, albeit not clearly articulated. Arguably, this project provides some tentative evidence that by assisting students to erode the time and space barriers between their multi-faceted lives; they will start to engage with the learning process [10].

### **Team Enhanced Creativity (TEC)**

Thus, the success of ‘Quickstart’ with the new student intake set the parameters for the RLO-CETL work, which set out to engage new undergraduate, non-traditional students by integrating a rich series of multi-media learning objects within a teaching and learning strategy. The team decided to follow the trend of the Quickstart approach by focusing on study skills. The study skills RLOs were developed through a process of both tutor and student involvement in the briefing process, followed by close liaison between other team members such as the multimedia developer, manager, the peer evaluator and colleagues from partner institutions, etc.

TEC involves 6 phases, which may overlap with one another. The users in our case study were 70 first year students that joined the University to study Marketing, and have a core ‘Studying Marketing’ module in their first semester. Throughout the TEC phases, the tutor had to adapt to multiple roles of tutor, designer, evaluator and user. The materials developed can be viewed on the module website: <http://learning.north.londonmet.ac.uk/bssmstudy/p540.htm>

Stage 1 – Agree contract. Teams are formed around each RLO (some of which were thematically linked). The contract makes clear roles and responsibilities, delivery dates, outputs and includes the requirement to sign up for a Creative Commons agreement that makes the RLOs ‘free for World’. The dangers of IPR and Copyright are pointed out.

Stage 2 – Ensure Head of Department is ‘on board’. Without the support of HoDs the creativity will, in our view, not lead to sustainable institutional change.

Stage 3 – Brainstorming at Wolfson Reward week in Cambridge, June 2005 (a meeting of all project partners and RLO developers). Students are given bursaries to attend these sessions and become engaged in the design process. For example, the whole approach to the Referencing RLO that was mapped out was based on a significant student observation that students don't reference “because they [the students] think that tutors will think they don't know enough ... and it will lower their grades...”

Stage 4 – Ongoing team meetings back at the University. The team moved from note taking at meetings to iterative prototyping; i.e. discussions around a mock-up of an RLO. The specification for an RLO would be refined and grow as a result of these discussions. Once a working prototype is ready, a peer reviewer external to the team is appointed to give ‘scholarly’ feedback as a subject expert that is ‘trusted’ by the team.

Stage 5 – Formative Evaluation of the RLOs - Incorporating student and tutor (user) feedback into the design. When a prototype was ready it was put on the website and students were asked to give feedback. All module tutors and seminar tutors (around 40) were also emailed to ask for feedback. Once any changes have been made as a result of evaluation then the peer reviewer appointed in stage 4 performs a final ‘health check’; once passed this second review the RLO is considered ‘delivered’ and is handed

over to a named person at each site to upload into the RLO CETL repository. Thus all RLOs are deposited in the RLO-CETL repository (Intralibrary) using appropriate e-learning standards (UK LOM CORE). In 2007 the RLO-CETL repository will be opened to the public view with the invitation to reuse and repurpose our RLOs under a Creative Commons Licence.

Stage 6 – Summative Evaluation of the RLOs was conducted using the RLO-CETL Evaluation Toolkit, which has been devised and used by the partner institutions. The results were very positive.

TEC is currently being used to develop RLOs in other subject areas and hence appears to have wider applicability. Over 40 RLOs have been developed at London Metropolitan University using TEC and more are in the design stage. An example of one of these RLOs is an interactive resource to help students with reflective writing. It includes theory on reflective writing and learning cycles, a quiz on learning styles, and has video clips of students talking about their experiences of completing reflective writing projects. This RLO and others can be seen at: <http://www.rlo-cetl.ac.uk/rlos.htm>.

## Evaluation

Evaluation of the RLOs is carried out by the local evaluator at the relevant partner site, using the tools developed in the RLO-CETL Evaluation Toolkit. A minimum set of tools has been specified, that includes a student questionnaire, field notes, tutor's forms and a technology and deployment audit.

In the results from the student questionnaire, overall the students have given very positive ratings to the learning objects and have made positive and interesting qualitative comments. The student feedback indicates that there are no particular problems with using the learning objects to be addressed. The purpose or objectives were clear, they were easy to navigate, and they introduced new concepts and language clearly. All the students bar one would recommend them to another person with similar learning needs. All of the students bar two would like more of these learning objects in other modules. With respect to learning from the learning objects, students agreed that their content was appropriate, the learning objects were well integrated with other parts of the module, they were pitched at the right level, and students enjoyed being able to learn on their own.

Students rated the importance of a number of attributes of the learning objects: 60% thought the visual components were important, 67% audio/commentary, 100% interactivity, 80% assessment/self-test exercises, 100% access anytime, 93% access anywhere and 93% working at my own speed. Interactivity, and the fact that they could access the learning objects at any time, from anywhere and work at their own speed were particularly important to the students.

8 very positive comments were given in the open-ended questions:

1. They are very interesting and easy to use and do.
2. I don't think I would change anything. Everything fits perfectly.
3. I enjoyed the learning objects very much.
4. For me it's just perfect. I really can't think of anything better!!!
5. I think they are great, no need of improving.
6. I was completely content with everything. I even improved my IT knowledge.
7. Very good learning tool that helped me a lot.
8. Is really good that you can access information online! It improves learning very much!!

It is envisaged that these RLOs, having now been tested and evaluated will become fully integrated into the teaching and learning strategy for the module across the department in October 2006 (around 1200 students and across two geographic locations).

In order to delve into the issues that emerged from the above feedback two students were interviewed:

A major consideration in inviting students to participate in this project centred on issues as to who to invite. The CETL manager made it very clear that excellence in the student was the main requirement, but how was this to be measured or otherwise judged? There were many students that would benefit from participation in the project, but finally it was decided that two students would be approached, one male, one female, both of whom the tutors felt would be able to 'hold their own' in terms of acting as student advisors to the project. Tenni et al [11] talking about the researcher as auto biographer, suggest that a willingness "to see, confront and discover oneself in one's practice and to learn from this is at the core of this work and central to the creation of good data". This proved to be excellent advice, as our two students were extremely vocal and critical about the role of the tutors on the project. It was also rather difficult to hear that despite ones' best efforts, one was patronising - as this extract from an interview with one of two students involved in follow-up interviews shows:

"There was an element of expectancy of performances on students...and you all referred to us as "the students" and to each other by name."

Extract from interview with Student A

## Conclusion

On a pragmatic note, the following lessons have been learnt from the first iteration of TEC, and we need to tighten up on some aspects of the development process, without stifling the creativity of the team.

- The development of the RLOs was 'just in time delivery' and a decision was made that the development should stop two weeks before delivery. This will be hard for tutors in that tutors are a critical group and tend to want to refine RLOs well past the official cut off point.
- Final quality assurance (proof reading etc) by people external to the project should take place. The final week should be devoted to testing in target classroom. Make sure that any technical requirements such as Flash 8 players are available in all classrooms.
- In the future development of RLOs, the tutor (who acted as a 'mini-project' leader) has decided that she would brief her team differently, for example get agreed indicative deadlines, get staff to feedback 'officially' through the project team, and not to start an RLO without an exact time/date of the student group who would evaluate it. This information needs to be available and kept up-to-date and communicated to the wider team so that evaluation can be planned and organised in an effective and timely manner.
- The project agreement form needs to include all team members' signatures and sign up to concept of reuse and repurposing (i.e. Creative Commons).

In terms of the generality of our approach we are convinced that including the students and staff in the design process is a key to our innovation and success. Both students involved in our follow-up interviews said they got involved in the project because they believed in the principle of the student voice and the project as a whole. It is often hard to deconstruct what lies behind rhetoric of student involvement and student centeredness. Indeed, we would observe that there are aspects of the structure and process where there are clear conflicts between equality and enabling the student voice. The work of the CETL so far supports the view that we need to move away from a designer driven model of the development of learning technologies. A sharper focus needs to be taken from the outset to the use of learning technologies in the communities for which they are designed. With this view in mind the CETL is moving from 'use' and onto reuse, with RLOs crossing Departmental and indeed Institutional boundaries. The challenge for future work will be track the effectiveness of this reuse and to move away from the default and unproductive attitude of expectancy when including student users in the design process.

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