

Design, Development and Evaluation of Collaboratively Developed Open Educational Resources for the Post-Primary Classroom

Introduction

Despite the attempts to integrate ICT across the curriculum of all post-primary education systems in the developed world there remains low levels of use (McGarr, 2009). One of the major reasons for this low level of use is the availability of curriculum relevant software. In recent years the availability of high quality authoring tools has provided opportunities for the low-cost development of highly reusable curricular relevant materials. The increasing use of educational repositories can now facilitate the wide-scale distribution of these resources. This has the potential to radically reconceptualise use of ICT across the curriculum in Irish schools, particularly in the Humanities area, an area that has not traditionally incorporated ICT (Ertmer, 1999; Ringstaff and Kelley, 2002; Baek, Jung and Kim, 2008).

The Study

The research aimed to develop curricular specific courseware for the teaching of poetry at Junior Certificate level in Irish post-primary schools. It aimed to capture the collaborative design and development process used in the development of the courseware and describe and evaluate the implementation of the resource by teachers in different educational contexts.

The research employed a case study approach as it was seen as the most suitable methodological approach to capture the richness of the design and implementation of the resource. The resource was developed in collaboration with six practicing teachers and implemented in three different schools in very different classroom settings. Through the use of semi-structured teachers interviews, student questionnaires and classroom observations the research methodology employed aimed to capture the richness of the experience from the participants' perspective.

In conducting this research study, one of the primary aims was to understand how learning objects could be used to engage students and enhance their learning experience. This research intends to examine how students could use technology to critically engage with an online resource and construct a personal learning experience which could then be applied to other areas of their daily lives where they are required to engage with online resources. This study will also explore how one RLO could be used across multiple settings. In order to do this a study was planned which would follow the fundamental components of case study research. This study drew on both quantitative and qualitative data collection methods such as observations, online surveys, and focus group interviews, online discussion fora and LMS event logs.

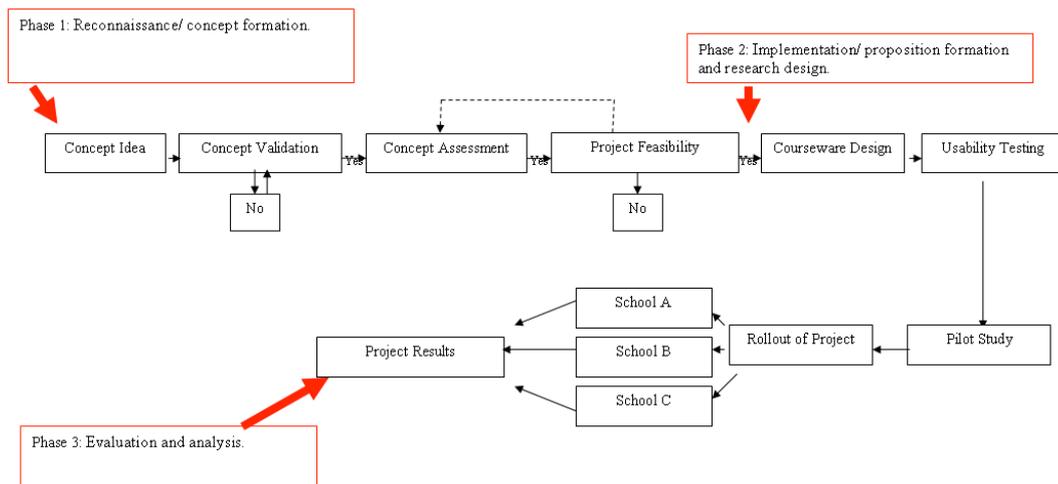


Fig 1: Visual representation of the study

The research found that despite the low levels of ICT use in schools the participating teachers were enthusiastic users of the resource. While it was evident that the students had limited experience of using ICT in schools they nonetheless enjoyed the experience and appeared to benefit from use of the resource. The research also found that the resource was highly reusable and was interpreted and used by teachers in different ways to best suit their needs and the needs of their students.

As with all learning resources educational software has a multitude of uses in the classroom context. At a very basic level any educational resource can enhance the role of the teacher whereas on the opposite end of this spectrum educational resources can have a much more significant and fundamental change to the teaching /learning environment (Laurillard, 2009; Boyle 2003) . On completion of the learning resource it was envisaged that the RLO developed in this study could be used in two quite different ways:

1. As primarily a teacher resource used to enhance the role of the teacher as the imparter of knowledge. In this context, the teacher, using a projector, may direct learners through the resource and the activities on screen.
2. The second type of use is where the students would use the resource completely autonomously with little/no direction from the teacher.

Results

Having completed the case studies for this research a second dimension emerged. While software can be used to enhance the role of the teacher or liberate the learner to become more independent, autonomous and self-directed there is a second intersecting dimension which involves whether the software is used as it is intended and designed or whether the teacher subverts and adapts elements of the resource to suit their educational needs. What is important in this aspect is that these needs may be teacher centred or student centred. The diagram below highlights these intersecting dimensions and is a very useful visual representation of the various possible uses of the resource developed for this study.

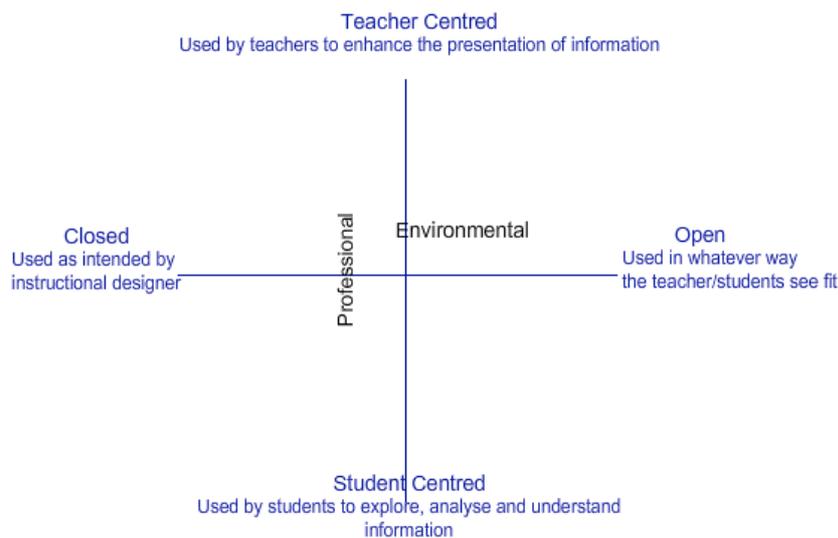


Fig 2 Visual representation of the nature of use of learning objects in the classroom

The type of use may be categorised into quadrants: open, closed, teacher-centred and student-centred. It is interesting that these very different types of use are all catered for by one learning resource. If anything is to demonstrate the crucial role of the teacher to the classroom it is this. How the object is used rests primarily with the choice of teaching strategy that the individual teacher engages in. It is not, as some mistakenly believe, the software that determines the pedagogical use in the classroom.

Upper right quadrant: teacher centred and open.

The upper right quadrant describes a use that is teacher-centred, open flexible use – but what is meant by this and how could one describe the nature of use in this quadrant? The teacher will direct how the resource will be used. The teacher may decide to use individual aspects of the RLO with class and may not use others. Therefore a teacher may decide to draw students’ attention to the audio material or a photograph of the poet but they may decide not to use other elements such as any the activity material available. In this scenario students have little or no level of opportunity for autonomous use. The student progresses through each of the screens in the manner and pace that the teacher dictates.

Upper left quadrant: teacher centred and closed.

The upper left quadrant describes a type of use that is quite mechanical. This type of use is teacher-centred but closed rigid use. In this scenario the power is again primarily with teacher and the student is more passive. The teacher will direct how the resource will be used. However, this type of use tends to be quite linear in nature. The teacher will go through all of the on screen elements before progressing to the next screen. Students have no opportunity for autonomous use. The teacher may nominate students to read aloud from the screen. The teacher dictates the pace at which students progress through each of the screens. The students may write the answers to the questions in their copybooks. Annacotty College experienced this type

of use. As the class was a weaker support group they needed the teacher to take more of a role in their use of the resource. Where students encountered new vocabulary or where some element needed further explanation the class were able to ask the teacher without drawing negative attention to themselves. This type of use tends to occur in a classroom where the focus is more didactic Callan (1997) and Mackey (1998).

Lower right quadrant: open and student centred

The lower right quadrant describes a use that is both student-centred and open. This type of use is quite flexible and is for creative users. This type of use occurred at St. Mary's where the students used the RLO for the TL21 project. In this instance the students were able to adapt elements from the resource for their own project work. In this type of use the teacher may assign a task but students are allowed to carry it out at their own pace. The teacher may not provide any direction for how the resource will be used. The student progresses through each of the screens autonomously. The students may write the answers to the questions in their copybooks or they may chat among themselves to discuss the possible answers. This scenario sees students engaging in self-directed learning where the power lies primarily with the student. In this environment the students seemed to greatly enjoy personalising their learning experience.

Lower left quadrant closed and student centred

The lower left quadrant describes a use that is student-centred but closed. The teacher will direct how the resource will be used. This type of use may be described as off the shelf learning. Students have a lot of opportunity for autonomous use. The pace at which students progress through each of the screens can be negotiated so that it is either student led or teacher led. Cedar Hill used the learning resource in this manner. While they had homework tasks assigned to their use of the resource how they used the resource was completely at their own discretion. These students also had the additional facility of the VLE. Their learning experience was very positive and their teacher also reported that he was confident that learning had taken place in a very positive manner. There are many advocates of this type of autonomous learning in the existing literature. Many have identified the benefits of such an environment eg Kupetz and Ziegenmeyer (2006) as discussed in the literature review.

Conclusion

There is a body of work to be found in the literature endorsing each of these types of uses. Each type of use certainly has merit and it is up to individual teachers to decide which type of use works best for them. One of the most important things to note from the experience of this study is that ICT can be made as flexible or as fixed as an individual teacher is comfortable with. This echoes Cuban's theory where technology may be seen as an amplifier for the existing classroom activities (Cuban, 2001). The lower right quadrant where the type of use is both student-centred and open is arguable the most ideal learning environment for the student. Control of the learning process is handed over to students. What are the contributing factors that will promote this type of use being adopted over other types of use? Arguably, the most influential factors on type of use are environmental and professional. If we see environmental factors as lying along the horizontal axis and professional factors lying on the vertical axis then it is possible to identify what the barriers to the most ideal

type of use are and what measures can be put in place to address them. The SETT framework (Zabala, 1995) considers four elements when considering the use of assistive technology with students: Student, Environment Tasks and Tools. As the classroom grows more diverse and students may not be streamed until later in the school years this framework should not be limited to the area of assistive technology but can be seen in any classroom environment which adapts technology. How a teacher rates their own techno-pedagogical competence determines how the resource will be used. This is their competence to use technology for pedagogical reasons, competence to integrate technology in teaching

Although outside of the scope of this paper the findings of this research suggest that the framework used in the collaborative development of the resource has enhanced the reusable nature of the object and that future resources should employ a similar collaborative approach. The research also suggests that the reusability of the resource is dependent of the curricular and pedagogical coherence of the learning object. The research raises a number of issues for the development of such tailor-made solutions and highlights opportunities for future developers.

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