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ARE INSTRUCTIONAL DESIGNERS WORTH THE MONEY? ENCOURAGING FLEXIBILITY IN DESIGN

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Abstract

The paper describes the role of the Instructional Designer in the development of an education resource that was produced against a background of challenging design requirements (conflicting purposes and different target audiences). It is argued, and illustrated, that the key activities normally undertaken by the instructional designer can assist in the resolution of conflicting design requirements, resulting in a flexible resource that is considered acceptable and usable by a range of users/learners.

Keywords

Instructional Design, Flexible Design, Virtual Field Trip

Introduction

This paper describes how a series of conflicting design requirements can be overcome with a strong focus on instructional design. A typical multi-media project team, comprising content providers, programmers, graphic designers, project manager, instructional designer and evaluator was set up to develop a CDROM-based educational resource. The outcome of that development has been viewed as a success by all participants and by people outside of the project. The project achieved its goals in terms of a product, but it was also successful in terms of the process. It is the reflection on the product and the relationship with the process which is discussed here.

The paper begins by introducing the project and its challenges, followed by a review of the traditional Instructional Design (ID) models in the development process. It then looks more closely at the involvement of the instructional designer in this project and the tangible and intangible benefits of that involvement.

The development of a CDROM-based teaching/learning resource for volcanology

The Department of Earth Sciences at the University of Waikato's School of Science and Technology offers a number of courses which take advantage of fieldwork techniques in order to enhance students' understanding of the geological processes. A field trip to the Tongariro Volcanic Area is a compulsory element of the third year undergraduate Volcanology course, and brings together all the elements taught in this course. The observations made by students during this trip are referred to in subsequent lectures and laboratory sessions. The trip is perceived as being of high educational value, although the lecturers were aware of the limitations of setting up and running the physical field trip, e.g. travel time, cost, the physical abilities of the students and complicating factors such as the weather.

Taking into account the above factors, the Department of Earth Sciences lecturers have been gathering research materials and resources which could be made available to students to help them become familiar with this volcanic area without necessarily having to physically undertake the field trip. This includes a series of photographic images and 360 degree panoramas of the most significant stops on the trip and a portfolio of research relating to the geographical area and the subject domain. However, this collection of

materials was only that, volume without structure, not in itself capable of giving students a 'full', or close approximation to the experience of the field trip.

The Department identified a need to support students' development of knowledge in the domain. Ideally, the resource would also provide a comprehensive learning resource that would integrate the field trip paradigm with subject material relating to the geological processes which shaped the Tongariro Volcanic Area and thereby support the learning objectives of the undergraduate course in Volcanology. While the CDROM could potentially replace the field trip, if it was cancelled due to poor weather conditions, it was envisaged that this resource would be mainly used in the preparatory phase before the trip, and after the trip as a consolidation resource.

The Instructional Design (ID) challenges

Multiple purposes:

While the educational purpose was the rationale presented to the development group at the start, a range of other motives were expressed by the major stakeholders. The initial intention was not, therefore, viewed by all stakeholders as one of developing a purely teaching resource. From academic management and elearning strategy points of view the resource could provide: (1) A means of promoting the subject matter and the research capabilities of the staff in that area by pulling together and presenting the research strands of volcanology. (2) An enhancement to the capability of the Department to offer the Volcanology course online to distance students. The lecturers on the other hand felt that producing a resource which showcased the results of their research into the Tongariro area could be of long term value not just to their students, but to the New Zealand public, tourists and the international scientific research community.

Multiple target groups:

The material for the resource was available as different media forms, such as photographic panoramas, text, still images, video-clips, maps etc. The content providers approached the multi-media development team with the idea to make these resources available to different audiences e.g. undergraduate students, research community, secondary schools, general public and tourists, using the metaphor of the field trip. The solution of dealing with different audiences by simply shifting the responsibility for identifying and presenting relevant information entirely onto the user by simply making this material 'available' on a CDROM as a repository of information is not one that that development team believed was acceptable. Having no structure and no guidance in such resources means that people's ability to find relevant information is limited, their exploration is much reduced as is their level of satisfaction. The question for the development team was, how to find an appropriate guidance system that meets as much of the requirements of these different target groups as possible.

Integration into curriculum

In terms of the integration of the resource into the well-established curriculum this is a problem commonly encountered where an existing educational programme has been operating for some years. The support resource can take some time to become integrated. In the case of this resource, that problem could be compounded by the potential scale of use of the resource in the course activities. The degree of effect would be dependent on its construction and how the various content sources could be combined. If the resource could support many of the major aspects of the course, it could have a disruptive or energising effect on the teachers and the students.

In summary, the three main challenges for the Instructional Design were: (1) Multiple stakeholders with different purposes of the resource. (2) Multiple potential audiences for the same resource. (3) The integration of this new resource into the existing curriculum.

The role of the Instructional Designer

The design process usually starts with a learning requirements analysis: "design begins with the identification of the goals of learning" (Gagné & Merrill, 1990). In order to facilitate the achievement of

these learning goals, instructional designers need to identify a target audience for the educational systems or resources being developed and find out the relevant learner characteristics, such as the learners' prior knowledge, skills, experience, interest in the topic, learner attitude and the level of intellectual skills and cognitive abilities which are required to gain an understanding of the topic (Richey, 2000). It is these learner characteristics which should influence the selection and design of instructional strategies.

While a number of traditional instructional design models exist, such as Instructional Transaction Theory (Merrill, 1999), and Elaboration Theory (Reigeluth & Stein, 1983), Tripp (1994) argues that today's instructional designers tend to work in a less structured way and often use a mixture of systematic approaches with opportunistic tactics and spontaneous responses to take advantage of situations that "yield unexpected insights into the problem" (Tripp, 1994).

ID approach used in this project: focus, flexibility and scaffold

As outlined above, there were three major design challenges faced in this project. In the experience of the development team, there often needs to be some overarching philosophy that will identify the key decision points in the design process and the consequences of the decisions taken. Therefore, the strategy adopted to face the problem of making the resource suitable for different user groups and a variety of purposes was (1) focus on one target group and one purpose, (2) structure the material in as flexible as possible a way in order to allow all other potential user groups to access it according to their needs and (3) provide scaffolding.

Focus on one target group and one purpose:

A common approach enabling different user groups to access the same material in different ways is to use login functions. However, because of different usage depending on its purpose (e.g. usage in a computer lab; on a stand-alone machine, on a point of interest in a visitor centre etc.) this was not an option. The instructional designer, therefore, reviewed the source material and looked at how it could be used as an undergraduate teaching resource, thereby identifying and specifying a distinct user group. The students do not form a 'compromise' group. They cannot be viewed as being the 'average' of the differences in knowledge of volcanology between members of the public and the international volcanology research community. However, the instructional designer looked very carefully at strategies for these other groups that would provide bridges or scaffolding to help them make the transition between subject areas and levels of knowledge. This proved to be a key feature in resolving the conflicts around multiple users and multiple usage.

Flexible access:

The real life field trip component of the course had recognised educational objectives including, providing a context within which to place the volcanology subject matter, developing the professional skills awareness for practicing volcanologists and providing a real life experience of handling, viewing and interpreting field data. The purpose of the field trip, as a virtual entity, was a somewhat vague notion until the instructional designer identified, using a framework for viewing content in terms of pedagogical aims, how the material provided by the content developers could be packaged into a virtual field trip format and what the inter-relationships would be between the field trip and the volcanology subject matter. The resource comprises a virtual field trip that can take people through the region in a way that links directly to the volcanology involved. The field trip can stand alone within the resource if the aim is to look at an overview of the land and its features, to gain some knowledge of how to interpret the visual information and to understand it from different viewpoints and methods of visualisation (e.g. map forms, photographs, overlays). The volcanology area can also be used as a standalone element within the package, presenting the research material in the language that researchers in the field understand.

Provide scaffolding and bridges:

The supplementary functions such as the index and glossary provide some of the knowledge bridging mechanisms. The scaffolding function provides different users with the means of interpreting the package content and were given a stronger position in the package by the instructional designer than the content providers. The resulting organization of the material, the navigation methods through it and the formats in

which the material was presented, resulted in a resource that had sound pedagogical underpinnings and is a good learning/teaching resource but also one which can also be used as a ‘showpiece’.

Conclusions and recommendations

The development of the “Volcanology of the Tongariro Crossing” CDROM (Price et al., 2003) provided a useful and interesting vehicle by which it was possible to analyse the role of the instructional designer in the team. The role of instructional designer is a bridging role in many respects, but in the case of this project it became a much more significant driver of the design process and design product. The result of having a strong instructional design presence has been to introduce greater flexibility in the design, rather than constraining it, something which went against the initial assumptions made by the team.
The expectation of multiple uses and a range of audiences with varying degrees of knowledge and interest in the subject matter was a major complicating aspect of the design process, yet focusing on the instructional design elements helped clear this ‘foggy’ picture. The processes of focussing on one target and one purpose, allowing flexible access to content and supplying scaffold elements employed by the instructional designer in this project, provided the mechanisms for resolving the conflicting requirements for multiple users and multiple uses.

The only area in which the instructional designer was not able to effect a solution was that of integrating the resource into the curriculum. This was partly a practical issue, where the resource was ready when it was required, not before. A longer lead in time would have enabled staff to redevelop the course with it in mind. It was also an issue relating to the time and effort required to look at how to meld the course objectives and the resource objectives into a more seamless package.

The success of the product is a testimony to the flexibility of its design. It meets the educational needs of the primary user group (preliminary evaluations show it to be both acceptable and deemed to be of educational value by the students), but it also fulfils its role as a showpiece and as a resource for the general public. Distribution contracts with an agency involved in tourism has resulted in the resource being made available to the general public. Another contract involves using the resource for the secondary education market both for professional development of staff and for use in schools. The resource has, therefore, met its aims to be multi purpose and multi user. The experience of developing this resource reinforces the value of the instructional designer and of incorporating sound instructional design principles in the design process.

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