

Teamwork: The Key to Mapping Creativity in Multimedia Development

Sue McNamara, Kaya Prpric, Sharon Fitzgerald, Rosemary Viete, Rosamund Winter, Julie Pallant
*Faculty of Education,
Monash University
Sue.McNamara@Education.monash.edu.au*

Abstract

This paper describes the project management and design process models used in a project which aims to develop multimedia materials for use in the teaching of educational research skills to post-graduate researchers. Specifically the project focuses on processes and skills in the formulation and conduct of educational research such as the definition of the topic area, literature searching, the organization, storage and manipulation of data and the preparation of theses and reports.

The project management model uses a collaborative environment within which each member of the team undertakes a multitude of roles including those of developer, subject and technical expert, critical friend, end user and validator. Informed loosely by the notions of chaos and fuzzy thinking, and derived from a constructivist perspective, the development process model is an iterative research one, which parallels the thinking concerned with the practices of educational research.

This paper presents some insights into this approach to development and describes some lessons learned.

Keywords

project management, educational research, project organization, collaborative projects, creativity, teamwork

1. Introduction

The education community in Australia is beginning to investigate the potential of multimedia for education and training from a teaching / learning perspective. Grants such as those from the Committee for the Advancement of University Teaching (CAUT) are gradually encouraging the exploration of various media, alternate delivery mechanisms and strategies which will enhance instructional methodologies and approaches. Two major and critical components of such developments are project management and the design process.

Various management models are being employed in the generation of computer-based multimedia instructional materials including the individual or single person development and the more group-based models. Similarly, design models range from the more traditional behaviourist approach to those based on constructivist thinking and practices. The project management approach discussed in this paper is one of a problem-solving collaborative model, the basis of the design approach being a research model, derived loosely from the ideas of chaos and set in a constructivist context. Teamwork formed the foundation and connective link between the management and design processes of the project and has proved instrumental in tapping creativity to produce the information landscape in the materials.

Creativity in multimedia development may be defined as the blending of the pedagogies of teaching and learning with the structures and requirements of a technology environment. In the development of the interface, the information space, and the interaction strategies the qualities of teamwork (i.e., the shared ideas, positive, constructive critique and contributions from like minded and different perceptual and learning styles provide a rich encounter—both for the developer and as a result, for the learner. In an earlier paper McNamara (1991) discussed the place of individual imagination and creativity in instructional design. In the current project teamwork formed the instrument of ‘mapping’ which enabled the harnessing of the creative talents and contributions of a number of individuals with a wealth of expertise, experience and ideas to be incorporated into the materials development—and the eventual product.

Mapping refers to the manner in which the contributions of the various team members were integrated into the concept. In the context of mapping ‘the purpose of a team is not goal attainment, but goal alignment’ (De Marco and Lister, 1987, p. 123). To weave an analogy from these authors, the creativity of the project was the result of the *growth* of a productive team (rather than the *building* of a team) in which ideas were germinated, components were planted, the masterplan was nurtured and weeded, the final product being the multimedia package (perhaps analogous to the floral display), which will hopefully experience further growth and development. A brief description of the context of the project and the resultant materials illustrates the manner in which teamwork can be used to map creativity within the management and design architecture.

2. In the beginning

The rationale for the development of the materials was based on the growing emphasis on the conduct of research in education. As administrative, social and economic change impacts on the structure and practices of education and educational institutions, academics, teachers, trainers and others in the educational community are faced with the need for research skills. Concurrently, technological developments of the so called information age are dynamically changing the manner in which we access and use information, and in turn the thinking and information requirements of educational research. Ironically perhaps there is a growing body of computer-based research tools which can be applied to educational research; however, there appears to be no computer-based instructional materials which inform researchers of the potential use and functions of these tools. Further it appears that little work has been done with regard to the development of *instructional* materials for use in courses relating to educational research. Student demand for knowledge and understanding of research processes and electronic tools which can be applied to research is growing at an exponential rate and it would seem that this need cannot be met under current practices.

The research process and the vast array of tools and resources can be somewhat daunting for those undertaking research for the first time, for the occasional researcher or for the researcher investigating unfamiliar territory, paradigm or methodology. The need for electronic and information literacy skills places an extra dimension on the training of educational researchers as they acquire the knowledge and skills associated with the various paradigms and methodologies of educational research. Difficult to teach by traditional methods, the processes of research and electronic manipulation of information, particularly as they relate to an information age, are critical abilities for all educational researchers. The package which forms the focus of this project aims to complement courses in educational methodology and provide materials which can be utilized in a flexible environment to provide technological skills for research.

The particular course from which some of the ideas for this project were originally derived is an introductory course in educational research methodology (Rowley, 1994). The subject deals with the various methods, components and processes of educational research and attracts a large number of students. Several of the components of the course deal with the use of computer-based systems

and applications for educational research. Because of the large number of students and limited resources, students are usually given an introductory overview of these systems where possible and must then pursue skills in using the systems on their own. Students usually proceed from the course to develop and undertake their own research and, often at this stage, would hope to revisit the tools they have viewed previously, wishing to use them in their own contexts—as research tools. Given the assumptions of a generic profile of the educational researcher, the development of the materials, which we have called as a working title **Research Traveller**, becomes even more opportune.

3. The Traveller

Participants in post graduate degrees in education are primarily part-time, mature-age individuals studying within the constraints of family and professional commitments, to whom the requirements of research development, and the components of research practices such as defining the purpose, design and methodology of a study, literature searching, gaining state of the art information about their subjects and data analysis may prove extremely difficult. As a consequence of the part-time nature of their studies they have limited time and thus limited access to resources and specialist assistance. Further, the number of participants having the added constraint of English as a second language grows as the number of overseas students studying in Australian tertiary institutions continues to increase.

In conjunction with these constraints a large number of students entering post-graduate courses and degrees (adult, part-time participants) have little if any computer-related experience. Most have seen the infiltration of computers in their workplace, but have been on the periphery of actual involvement. Whilst a growing number are gradually becoming familiar with the application of wordprocessing most have minimal awareness of possible applications or functions of computers beyond this for educational research.

The learning requirements of each individual may differ markedly, as does their preference for particular research approaches and methodologies. Hedberg (1995, p. 2) refers to Säljö (1979) in listing the concepts of learning as indicated in a study of adult learners. Briefly he maintains that learning may be perceived as

- memorising or storing information;
- a quantitative increase in knowledge;
- the acquisition of facts, skills and methods that can be retained and used as necessary;
- making sense or abstracting meaning;
- interpreting and understanding reality in a different way; and
- comprehending the world by reinterpreting knowledge.

Although coursework studies introduce students to the concepts of research and the various components of technology which might be applicable to research, the current learning theories of constructivism (which form an underpinning of the **Research Traveller** materials) suggest the need for flexible mechanisms which will allow the researcher to acquire their research knowledge and skills through exploration in their own time, at their own pace, with variable requirements of feedback and support, and accessing as much or as little information as they need in a repetitive fashion if required. The traditional classroom environment can offer only some of these facilities for learning. Computer-based materials may thus offer an alternative.

Ramsden (1992) offers a further consideration of the profile of the research traveller in his discussions of deep and surface learning. Again, whilst the assumptions of learning theorists such as Gagne have provided general guidance in the more traditional platforms of instruction, and have provided ready associations between the instructional features of technology and instructional events (Wallace, 1995, Webster, 1995) traditional rotational design models (e.g. information-activity-response-consequence-information) do not always provide appropriate structures and flexibility in relation to the problem solving contexts of educational research. Hence the functions and practices of event driven design would seem more appropriate to the explorations of research processes, skills and tools and to the context of a constructivist approach. The above considerations reflect those which formed one of two concerns of the design model and initiated creative responses in addressing the characteristics of the traveller. The journey of research formed the second consideration.

4. The Journey

The research journey is envisaged in this project as one which is unique to each individual, but which shares a number of processes. Hence the components detailed in figure 1 form the major exploratory paths of the journey.

Both the process of research and the design processes of this particular project reflect an iterative transition, the focus moving forward and backwards between the internal conceptualization of research and the more external resources which are visited in the process of conducting research. The metaphor used is one of a traveller—a swaggie—who travels between the campsite, where he may reflect on his work, and the town to which he travels for outside resources.

Within this scenario, the caricature of the traditional Australian swaggie is representative of the researcher, undertaking the journey with a few basic possessions. The scenes which form the information landscape include features such as the hills in the distance which represents the spirit of research, perhaps the mystique, perhaps the concrete nature of a problem being addressed. The swag bag, containing the possessions of the traveller, includes a map wallet indicative of the management of literature, the cooking utensils characterizing data analysis, and the notebook—the writing process of research. Naturally man’s best friend (an Australian kelpie) provides the ever faithful advice to the traveller in the form of research tips. Beyond the traveller, or external to him are the resources used in research, the data collection (General Store), ethical considerations (Permits Office), naturally the town library and the colloquial local hotel where researchers who have taken similar journeys share with the traveller the stories of their experiences. Within each of the landscape localities and campsite features lie information about or introductions to the myriad of skills and concepts required across the whole range of processes involved in the preparation for research and writing of the dissertation.

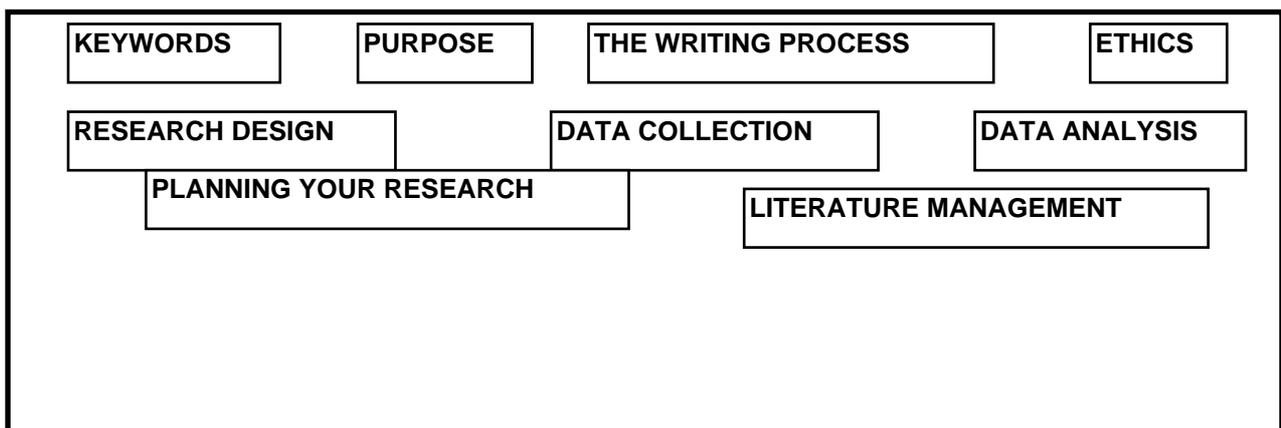


Figure 1. The major components of the materials.

The Learner (the traveller) and the learning (the journey) form the specifications for the design brief of this project. Using creativity to map or activate the interactions of the learning space is the function of project management and project design.

5. The Project Management Model

Greer (1992) presents the typical project management model as a three phase process. Phase 1 encompasses project planning, phase 2 being the conduct of instructional development, and phase 3 comprises the followup. Underlying this structure is the idea of a hierarchical model of management, with a single project manager and a specialised team, each individual having a specific role. In contrast a team approach is based on the sharing of leadership and the undertaking of various roles. The team approach is not new but it fosters much creativity in the pooling of expertise, ideas and experience. Hedberg *et al.* (1994) believes that a team approach has considerable advantages over individual approaches with team members providing unique contributions. Collaboration and co-operation are fundamental features of the team approach to project management. In this project group meetings and brainstorming sessions were used as the primary idea generating sessions, individual team members contributing specialist area expertise from their own experience. As a function of the team management approach, each team member became the 'critical friend' for the other content specialists and all shared in the experiences of design for an information space in which all had varying levels of expertise and understanding (i.e., the development of multimedia). Perhaps the most important feature of the team approach in this context was the manner in which it cultivated the expansion of the project from its original focus on relatively narrow technical skills, to a subtle recognition of the need for a more holistic and research information rich environment from which deeper level thinking about and cognitive skills for research could be generated in contrast to the more surface level procedural skills for example simple literature searching. The project management approach in essence provided a coathanger on which all other aspects of the project could be arranged. The arrangement of these aspects was informed by the design process model.

6. The Design Process Model

According to Hedberg (1995, p. 4):

most team projects rely on content experts developing basic outline, instructional designers taking the outline, identifying the tasks and sub tasks and developing an instructional strategy which takes account of the learning tasks and conceptual development requirements of the user. The team approach must be systematic. The process is enhanced through the use of development sequences which allow creativity and yet support a focus.

He suggests a more iterative approach. The design process for this project utilized a systematic approach, however in contrast to the more traditional systems approach as described by Leshin *et al.* (1992) of task analysis, lesson development and media utilization, this design model contained a dynamic interactive element in the form of the reflective encounters of team members. Thus during the design process the specifications were subjected to continual iterations as ideas, practicalities, extensions and enhancements transformed the initial skeleton. Work sessions were audiotaped, journals maintained by team members and within the context of the exploration of research approaches, workshops with researchers who were at varying stages of the journey were used to guide the development, provide perspectives and inform the design specifications.

7. Lessons Learned ... (The Continuing Story)

The team members in this project are all relative novices in the development of multimedia. Each has experience in different perspectives of educational research, the applications of technology to instruction and in the design and development of instructional materials. The project was born out of a concern for meeting the needs of learners. The management model mirrors the flexibility which we believe educational research requires. The design model encompasses our concerns for the manner in which educational research concepts and skills development are fostered in adult learners. In the passage of our journey to date we have learned a reliance on and tolerance for individual difference and an appreciation of the value of different perceptions, thinking, cognition and understanding, an occurrence which is not often recognized in institutional or project organization. We have noted the development of our own conceptualization of what multimedia approaches to instruction should and can do and the heights of exploration to which educational research might aspire. We have commenced asking questions of design of which we would previously have been unaware. Finally we have had the professional satisfaction of watching the refinement and reflection on our own teaching and research as we pursued a challenge and modelled a journey for others to follow.

8. Conclusions

The development of the materials is at the time of writing this paper not yet complete, but the lessons learned in project management and the design process so far have proved invaluable, reaching far beyond the realms of the project. For the team members, it has led to a deeper understanding of the processes and functioning of educational research. The management model and design models which have been generated by the project we believe have been reflected in the creativity which underpins the materials. We hope this learning is reflected for others in the materials and shared with those who would undertake such a journey in the future.

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