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Creative capstone computer projects for post-graduate students of English

ABSTRACT

The capstone forms an integral part of outcome-based education. Based on a concept from early Roman building techniques, a capstone experience aims to bring a period of study to meaningful and practical fruition. With this in mind, the English Department at the University of Stellenbosch has designed a module in its Honours course that allows post-graduate students the opportunity to develop additional skills in the design and development of multimedia projects that effectively combine the knowledge they have gained during the course of their English studies with state of the art technological innovations in education. This paper explores the nature of the capstone experience and discusses the contribution it makes to the education and skills development of post-graduate students. It describes the main assignment of the module "Learning and Teaching through Multimedia", shows that it demands carefully demarcated academic research, the ability to structure and present knowledge in an interactive multimedia environment and a sensitive understanding of both the learning and teaching process. As such, the assignment is a practical demonstration of skill and knowledge in an important, authentic context. The article is illustrated by extracts from multimedia projects completed by post-graduate students.

Keywords:
Capstone; Multimedia projects; English language; English literature; Postgraduate

Twenty tourists crane their necks backward to stare in awe at the top of the colossal stone arch that spans the blue backdrop far above them. The time-weathered arch is part of the little that remains of an ancient city in Turkey. The voice of the tour guide explains how the arch was constructed many centuries ago: how early builders such as the Romans used the arch to span openings and to support loads from above in structures such as bridges, aqueducts and large-scale architecture. She explains how each meticulously curved stone played its role in shaping the perimeter of the arch. With small, easily carried blocks of brick or stone the ancient craftsmen formed arches in which the upper edges had a greater circumference than the lower edges. Each block forming the arch was cut as a wedge or voussoir so that it pressed firmly against the surface of neighbouring blocks and so conducted loads uniformly. Progressing gradually from both sides, each wedge-shaped stone was fitted neatly to match the edges of its neighbour. Together they formed an incomplete, suspended bridge. Finally, in an engineering feat that rivaled any modern construction, the wedge-shaped capstone was slipped into its position to form the crucial structure that joined the two

components of the arch. It is this final capstone or keystone that supports the delicately curved arch suspended in mid-air, thus enabling it to resist the gravitational pull for centuries.

A number of synonymous terms are used to describe similar architectural techniques. The word "capstone" is a synonym for keystone and is closely related to a coping stone or cope stone in function (Illustrated Oxford, 1998: 184). A coping stone is the top stone finishing off a wall or a parapet. It crowns the wall or parapet and, like the capstone, is the final element that completes the structure, bringing it to fulfilment and fruition.

Now, many centuries later, the concept of the capstone has become an important element in education. It is a natural consequence of the new emphasis on Outcomes-Based Education or OBE that stipulates that all education should be complete and should have a specific, planned outcome. OBE involves a paradigm shift away from content-based learning wherein content, or knowledge of it, is an end in itself and rote learning all too frequently the modus operandi. Now the emphasis is also on the acquisition of skills, values and attitudes that enable the learner to make practical use of that which has been learned. This transformation in education evolved in part in response to demands from employers who feel that educational practices leave secondary and tertiary learners ill-prepared for the demands of the workplace. Frequently university graduates, particularly in the Humanities and pure Sciences, are thought to lack those essential skills that enable them to create, reflect, assess and solve problems, and gather and interpret information – in short, the skills that enable them to interact critically not only with their own thinking, but also with that of their world.

Bearing in mind the emphasis on outcomes, it is therefore not surprising that the educational ideal is that a period of study should culminate in a capstone project. Such a project should close the educational gap that exists between areas of study and form a basis to support future endeavours involving those areas. Similar to the keystone in an arch or a coping stone in a parapet, a capstone project in education should be carefully crafted so that it can connect the pillars of knowledge that have been built during a course of study. This project should be the culmination of a study period and should demonstrate that the student not only has the necessary knowledge, but also the ability to apply it. It should provide proof of conscious competence.

Capstones have also been designed to combat the "So what? Now what?" feelings of anti-climax and disenchantment expressed by students in their senior years when they are about to launch out into careers without really knowing what they know or what to do with it. The capstone should thus not merely be a dissemination of knowledge for its own sake. A Capstone Experience that is usually completed near the end of baccalaureate studies, should "integrate[s] liberal learning with specialized knowledge. Each capstone emphasizes sharing of ideas, synthesis, and critical, informed reflection as significant precursors to action, and each includes student initiative in defining and investigating problems or projects" (Miami University, 2002). At the University of Miami, for example, it seems that Capstones are advertised by departments on the Internet, and that students are also allowed to take Capstones at other universities that are then transferred to Miami provided they meet the Capstone requirements. A Capstone for a Miami ARC 426 course titled "Architecture and Society" investigates the proposition that architecture and society constitute a dialectical relationship; that architecture, as theory and practice, both produces and is produced by the workings of society. For the ART 453 Capstone in "Advertising Practice" students from Art, Communication, and Marketing compete in inter-disciplinary teams on an actual client's promotional problem. For another ART 452 "Senior Thesis Project" students explore a unique research problem that combines a significant facet of art/design that could result in an informational exhibition, a book and other multi-paged format, interactive media, video, or a combination of media (Miami University, 2002).

At the University of Stellenbosch, a Capstone (or "Sluitsteen Ervaring") demands that the knowledge, communicative skills and research methods used during undergraduate studies be utilized in a culminating experience in the final year that frames a significant question or set of questions, explores possible answers under the mentorship of an experienced tutor and, where possible, occurs through interactive group work. This can take different forms: a project culminating in a seminar, an essay or assignment, an internship or fieldwork followed by an evaluative essay, a performance, a demonstration or an exhibition. All of these should be related to the student's majors and provide students with a stimulating experience that broadens, deepens and integrates the knowledge and skills they have acquired.

This trend presents an interesting challenge to an English department as the study of literature should now have a practical, hands-on purpose as well as an esoteric one. Language departments too have to take cognizance of economic changes, technological inventions and the general call for an education that makes a dynamic contribution to the workforce.

An additional factor that demands recognition is the fact that the landscape of communication, the semiotic landscape, has undergone significant changes in the last few decades. Texts are becoming increasingly multimodal. The verbal mode, which was so strongly in ascendancy at the beginning of the 20th century and the main concern of language and literature studies in language departments for decades, is being challenged by the visual. Images are becoming more dominant in communication. Newspaper front pages feature many visual elements such as different font sizes, photographs, graphics and colour. In advertising, prominent campaigns like the international Benetton and the more local Du Lux campaigns rely solely on the visual symbol without any, or very little verbal input. Even the company letter, traditionally viewed as the epitome of conservatism, is favouring multimodality by opting for colour, innovative layout and fonts, and visual logos.

These changes in focus were the main concern of ten educationists, called the New London Group, who met in New Hampshire in 1994 to discuss the state of literacy pedagogy. They coined the term "multiliteracies" to describe the increasing multiplicity of texts and the integration of significant modes of meaning making in which the textual is also related to the visual, the audio, the spatial and the behavioural (New London Group, 1996: 63). In their exploration of pedagogy the Group agreed that what needed to be learnt was changing, and the main element of this change "was that there was not a singular, canonical English that could and should be taught any more. Cultural differences and rapidly shifting communications media meant that the very nature of the subject – literacy pedagogy – was changing radically". The focus, they decided, should fall on multiliteracies rather than on literacy only (NLG, 1996: 63). The New London Group identified six major areas in which functional "grammars" – the metalanguages that describe and explain patterns of meaning – are required. These are Linguistic Design (vocabulary, metaphor, delivery, modality, etc.), Visual Design (images, page layout, screen format, etc.), Gestural Design (body language, sensuality, etc.), Spatial Design (meanings of environmental, architectural spaces, etc.) and Multimodal Design (a combination of all designs). They came to the conclusion that learners should be made aware of the inherent multimodality of the designs that make up our modern world and should be able to "read" and understand these new texts. Clearly such trends will have a profound effect on teaching practices and curricula as well.

In an age when the multiliteral dissemination of knowledge through technological innovations is evident in so many spheres of life, it seems imperative that students of a language and their teachers should be aware of the potential opened up by technological development in all career fields, whether academic, corporate or entrepreneurial. Ideally, they should also possess the skills

to take full advantage of the possibilities. They should be flexible enough to be able to adapt to technology-based knowledge acquisition for the promotion of life-long learning. According to the Boyer Commission, which wrote a blue print for America's research universities:

> Continuing technological development, particularly in the areas of information storage, retrieval, and communication, can be expected to alter the manner of teaching at every educational level and in every conceivable setting (1998).

Universities are particularly well suited to take advantage of technology in their teaching. In fact, current rationalization processes make it imperative for them to think innovatively about the dissemination of knowledge. Universities planning to become e-campuses are stipulating that 30% of a course of study should be presented electronically. Commercial developers also keenly await new teaching material, particularly in the field of Second or Third Language Learning. Herein, however, does lie a danger as the Boyer Commission warns. The indiscriminate use of technological teaching aids runs the risk of instigating poor teaching practices and increasing the "real and psychological distance between living faculty members and living students" (1998). The Boyer Commission suggests that:

> It is incumbent upon the faculties of research universities to think carefully and systematically not only about how to make the most effective use of existing technologies but also how to create new ones that will enhance their own teaching and that of their colleagues. The best teachers and researchers should be thinking about how to design courses in which technology enriches teaching rather than substitutes for it (1998).

It is clear that such thinking cannot be left to technocrats alone. It should be done in conjunction with subject specialists and educationists to ensure that healthy pedagogical principles are adhered to. All too frequently one finds that a commercially available language CD is sound technologically, but educationally superficial or inappropriate; or alternatively, educationally sound but technologically disappointing and restricted. The aim should be to create new labour-saving computer capabilities for teaching to utilize the full potential of effective computer-based learning, thus extending and enriching the learning experience.

On the other hand, it is undeniably true that academic staff who are already struggling to cope with crippling lecturing loads and publishing requirements have little time and energy left to develop the skills needed to start a multimedia initiative. In addition, they are not generally rewarded or given recognition for significant contributions to the technological enrichment of their courses. At some institutions it is publish (in the narrowest sense of the word), or forfeit a salary increase. Given these constraints, it seems logical to equip students about to embark on a teaching career of their own with the necessary skills. For the sake of their own futures, students need to be given the tools and the skills that will enable them to explore the teaching and communicating potential of all that technology has to offer.

The module "Learning and Teaching English through Multimedia" in the Honours course at the English Department of the University of Stellenbosch, seems to answer to the call for multiliteracy and technological innovations. It provides fledgling English teachers, lecturers, trainers and communicators with the necessary educational and technological tools and the skills to enable them to take wing in the field of multimedia. In the module, they are challenged to "evaluate the presentation of materials through technology even as they develop an increasing familiarity with technological possibilities" (Boyer, 1998). The module also functions as a capstone experience that brings the academic study of English to a practical, fitting and satisfying conclusion.

The module provides basic training in the creation of a multimedia application or presentation in English using Authorware (an authoring tool that does not initially require computer skills beyond rudimentary typing). The main assignment of the module, an interactive multimedia text, gives the student an opportunity to combine two or more course modules of their own choice in one innovative application. In the last three years students have chosen topics such as the following:

- Understanding the 19th Century Novel
- An Introduction to Chaucer's Canterbury Tales
- An Introduction to Romeo and Juliet
- Caribbean Polyrhythms: the Poetry of Derek Walcott
- Ted Hughes: an Exploration of Poetry
- Chinua Achebe's Verbal Art
- The Gloriumptious World of Roald Dahl
- An Introduction to Macbeth
- A Close Reading of Two Short Stories
- Learning Parts of Speech through Greek Myths and Legends
- An Introduction to Gender Studies

As a practical, hands-on assignment, the multimedia text demands carefully demarcated academic research similar to that needed to plan and develop a course at a university or technikon, or for a corporation. It thus develops the ability to structure and present knowledge in a state of the art, interactive multimedia environment. It also demands insight into multiliteracies. Once completed, the project can be preserved as a CD for use in a job application, or simply as a demonstration of expertise.

The semester module is a balanced combination of theory and practice. The course focuses on important theoretical areas such as the criteria for optimal learning, neurological factors that influence learning and understanding, the motivational elements in multimedia, and the principles of multimedia design. In media education an important criterion is that students should be able to "read" media texts and write their own while reflecting systematically on the process of reading and writing, understanding and analyzing their own activity as media readers and writers.

The New London Group identifies two key concepts to help describe multimodal meanings and the relationship of different designs of meaning, namely hybridity and intertextuality (NLG, 1996: 83). Hybridity refers to the way the designer creates and innovates by hybridizing – by articulating established practices and conventions in new ways to create new meanings. Intertextuality, on the other hand, draws attention to the potentially complex ways in which meanings (such as linguistic meanings) are constituted through relationships to other texts, text types and other modes of meaning (such as visual design, layout or spatial positioning) (NLG, 1996: 83). In the Honours module, student projects are evaluated according to these two concepts. Ideally, students must show mastery in practice, as well as a critical understanding of the concepts involved and a cultural understanding of the particular context in which they have chosen to work. Projects are evaluated on the basis of linguistic design as well as visual, audial, spatial and behavioural design, and their multimodal relationships. In the projects, spoken design, for example the audio input, is a matter of audio design as much as it is a matter of linguistic design.

The topics of the multimedia-project are wide-ranging as they reflect the diverse interests of the students. Consequently, each student has to pay meticulous attention to the key concepts of multimedia design. These will be discussed under separate headings in the section that follows.

The aim of the project.

The aim of the project will depend greatly on the choice of topic: it might be purely informative, educational or remedial, or a combination of all three. A project on Roald Dahl's children's stories (Illustration 1), which could be used in a bookshop or a children's library, might have as its main aim the arousal of interest and curiosity to encourage children to read the books. Its aim would thus be informative and educational. "The Nineteenth Century Novel" (Illustration 2), designed to appeal to first- and second-year students, would be mainly educational. The presentation and/or teaching strategies should of course complement the main aim of the project as well.
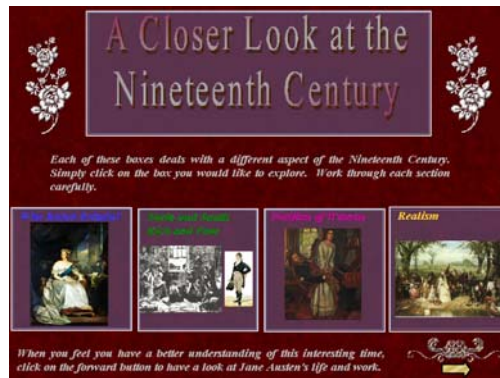
Illustration 1
Illustration 2

The age, level and language proficiency of the target group

The students should be aware of and able to articulate the cultural locatedness of that which they are putting into practice in their projects. A project aimed at primary school learners (Illustration 3) would differ considerably in approach and design from one on Chaucer (Illustration 4) aimed at third years. The approach, content, screen design and structure of the project should reflect the particulars of the target group for it to function coherently. The student thus needs to have a particularly clear understanding of the demographics of the potential audience.
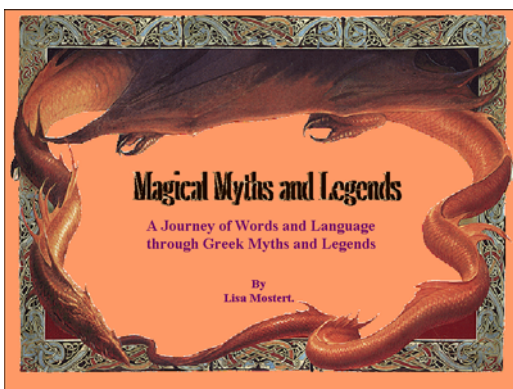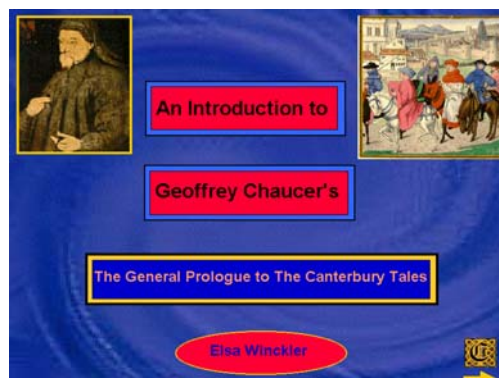
Illustration 3
Illustration 4

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The structure of the project

By constructing their own representations, students "interrogate their own positionality"(Archer, 2000: 90). The structure of their project should reflect the cultural context in which it has been positioned and illustrate that the student designer has given his/her own position and approach careful thought. Significant learning occurs when students demonstrate how they can design in a reflective manner, "new practices embedded in their own goals and values" (NLG, 1996: 87). The designer must decide, for example, whether to use linear or flexible progression that either controls movement through the programme or allows the participant the freedom to explore at will. Once again, the structure should be determined by the aim, target group and approach decided on. A project of the Caribbean Polyrhythms of Derek Walcott would probably give the viewer the freedom to read about his life, his period, his contemporaries or to study his poetry in random order (Illustrations 5 and 6).

Illustration 5

Illustration 6

Communication with the user

As students design and develop their own presentation, they should demonstrate a practical understanding of the process of production in a context wherein language is used for real communication purposes. Guidelines, instructions and explanations must always be clear, unambiguous and easy to follow, something not always consistently achieved even by experienced lecturers. The designer also has to tailor the mode, register and tone of communication to suit the topic. A project on Macbeth (Illustration 7) would obviously differ from one designed to appeal to primary school children on myths and legends or the "gloriumptious" world of Roald Dahl.

One of the most difficult aspects of a multimedia project is to keep in mind that the computer must say and do all the guiding. There is no lecturer or teacher to explain a difficult word or give a helping hand. The designer must be able to imagine fully how the screen design will appear to the viewer, how detailed the instructions need to be, and what feedback needs to be given for the aim of the project to be realized satisfactorily (Illustration 8). In this sense, planning and designing a multimedia presentation is more demanding than planning a lecture course. In the latter, the lecturer can at least deviate in order to explain an obscurity or to correct an error. The computer is a much more exacting taskmaster.
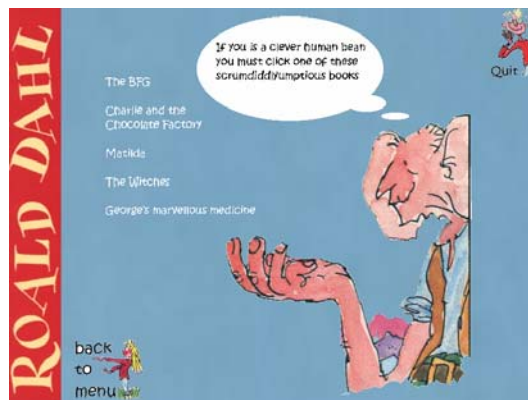
Illustration 7

Illustration 8

The full potential of multimedia

The project should illustrate a sensitive understanding of multiliteracies. It should use devices from all the semiotic modes of communication simultaneously and illustrate how meaning is constituted through complex relationships of different types of design features such as the visual, the auditory or the spatial. It should make use of sound, video, graphics, hypertext links and multi-sensory appeal, in other words, utilize the considerable potential offered by technology. At the same time, the techniques used must be functional. Every video, graphic or sound input must be relevant to the whole and must serve to further the overall objective of the presentation. As such the module provides an exciting opportunity to explore the aesthetic impact of multiliteracy through multimedia screen design. It also opens the door to technological and pedagogical innovations.

Interactivity

Finally, the product should be interactive so that the user becomes an active participant in the learning process rather than a passive viewer. The design should, ideally, include activities or exercises that arouse viewer interest and curiosity, and are challenging without expecting too much of the participant (Illustrations 9 and 10). Making the project an interactive one, is probably the most difficult aspect of all as the designer has to use creative and imaginative, yet pedagogically sound, activities and exercises that ensure viewer involvement. In order to motivate the participant positively and to make the computer an active partner in the learning process, the design must include the possibility of feedback that provides the programme, course or project with its own voice.
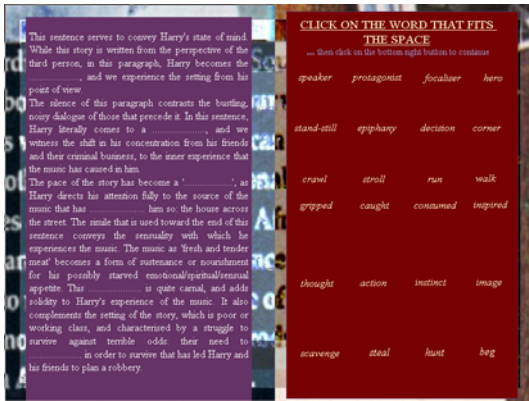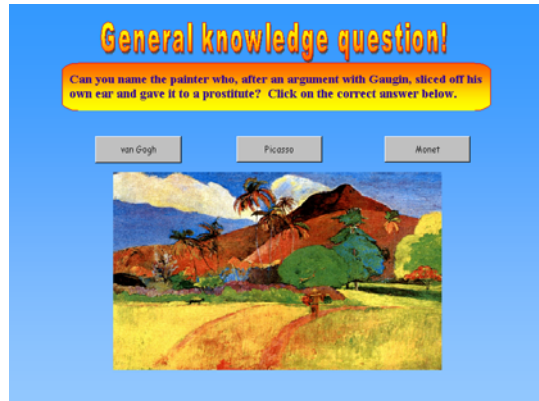
Illustration 9

Illustration 10

In such an assignment, content forms what Spady terms an outcome that is "an actual demonstration in an authentic context" (1993: 4). It is linked closely to "significant spheres of living" and also to a variety of disciplines and subjects (1993: 24). The multimedia and design skills learned during the module integrate or synthesize whatever knowledge and skills the student has acquired.

The latter is amply illustrated in the project "A Close Reading of Two Short Stories from Being Here"(Illustration 11). The screen designs by a student who majored in Fine Arts and English are artistically sound and aesthetically pleasing. In addition, it is clear that much thought was given to presenting a unified, coherent project. The student has succeeded in articulating established practices and conventions of close reading in new ways to create new meanings. She uses a background suggestive of the layers of meaning that need to be uncovered in an exercise in close reading by manipulating a text from the short stories in Corel Draw. Even the transitions between screens (she chose to use "pattern dissolve"), suggests the principle of intertextuality. The project also demonstrates an understanding of the potential of multimedia when the visual presentation of the text of the story "Nocturne" is enhanced by a reading that has Chopin's "Nocturne" playing in the background. She achieves a significant and functional relationship between the grammars of linguistic, audio and visual design.
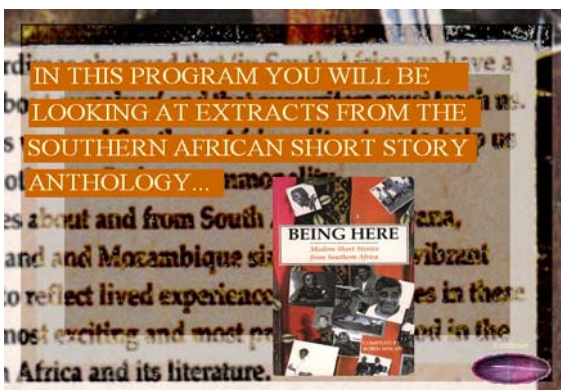

Illustration 11

Illustration 12

Although this particular student's cum laude pass of her Honours course in English proves that she is adept at linguistic design, at writing essays on literary topics (the main fare of such a course), the multimedia module illustrates additional talent, insight and understanding as well as the ability to plan meticulously and coherently.

The same can be said of a project like "The Gloriumptious World of Roald Dahl" (Illustration 12). Once again the multiplicity of design shows an understanding of the full potential of the semiotic landscape. The use of funky colours, informal font, the characterized Willy Wonka or Pelican narrator and the navigation buttons in the form characters from the stories all contribute to the playful atmosphere that is established by a creative range of novel activities and presentations. These include audio readings from the stories and extracts from the film version of one of the books. As capstone experiences, these projects "give additional information about student proficiencies in the discipline's content" and provide an opportunity to assess student attitudes, skills and talent from a different perspective (Banta et al, 1995: 103).

In a fast-developing, technologically enhanced world it would be unrealistic to expect creative writing (for this is indeed what such a project entails) and teaching to remain unchanged. The virtual classroom and instructional technology will play a dominant role in the 21st century and it seems inevitable that graduate and post-graduate studies should prepare multiliterate students who are able to combine subject knowledge, scientific study of the learning process, and technological innovations.

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