A LEARNING OBJECT REPOSITORY FOR COMPUTER ASSISTED LANGUAGE LEARNING IN ORDER TO PROVIDE RESOURCES FOR LANGUAGE LEARNERS IN SCHOOLS IN KWAZULU-NATAL

by

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Dissertation in compliance with the requirements for the Master's Degree in Technology: Language Practice in the Department of Media, Language and Communication, Durban University of Technology.

I declare that this dissertation is my own work and has not been submitted for any other degree or examination at any other institution.

Signed: _____ Date: _____

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Supervisor: Professor D.D. Pratt

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Abstract

This study, carried out within a critical realist orientation, offers a digital approach to providing language learning resources to learners in KwaZulu-Natal by developing a language learning object repository (LLOR). The purpose of designing and setting up a LLOR prototype was to find a way to augment and supplement the resources provided by text books, the provision of which has hitherto been fraught with service delivery problems. Margaret Archer's substantive theory of morphogenesis was used to provide a social science framework within Bhaskar's critical realist meta-approach. The morphogenetic approach suggests that, for technological advances to be accepted as part of everyday educational practice, they must be included in the fabric of the existing social structures of teaching and learning. This had implications for the human computer interaction (HCI) aspects of the artefact, which was developed by both anticipating user needs at the outset and confirming these at intervals; it also looked at the development of digital resources over a period of time in terms of the artefact being part of a larger movement towards using digital resources.

The iterative design of the LLOR followed a series of piloting different application stacks, including MediaWiki, TikiWiki CMS and Joomla. Moodle was chosen as the most suitable application as it facilitates the sharing of content using the Sharable Content Object Reference Model (SCORM) and can also easily be packaged in an offline self-contained pack for distribution to users who have limited Internet access. Three user groups, comprising experts (those who are proficient with web and computer technologies), teachers (a representative group of teachers who were second language teachers of English) and a representative from the Department of Basic Education (DOBE), were asked to test-drive the LLOR and respond to questions about its ease of use and potential.

The LLOR was primarily intended for teachers although it supports students as well. The use of a user-contributed model in the design of the LLOR anticipates

the challenge of providing direct support (editorial), as in adding new resources by only the researcher and also accepting that consumers are more likely to support user-contributed models, if they are also contributors. The key to facilitating access to resources like the LLOR is to make them accessible through different devices especially mobile platforms such as (cell-phones and tablets); future development will prioritise a mobile ready version of the LLOR. The value of the research is thought to lie in furthering an innovative mode of teaching in a digital medium setting where educational communication achieves virtual mode in and out of the physical classroom.

Preface

DECLARATION OF ORIGINALITY

I, Pregalathan Reddy, declare that this dissertation is my own work, and all the sources I have used or quoted have been indicated and acknowledged by means of complete references. The only form in which this work has previously been published is in the conference paper listed below.

PRIOR PAPER / PUBLICATION ARISING FROM THIS STUDY

Reddy, P. 2012.The development of a language learning object repository (LLOR) for second language teachers in KwaZulu-Natal, South Africa. Proceedings of *5th International Conference of Education Research and Innovation (ICERI 2012)*, Madrid, Spain, 19-21 November 2012. 5454-5462.

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Acronyms and Initialisms

CAREO	Campus Alberta Repository of Educational Objects
CMS	Content Management System
ESL	English second language (not necessarily second language, might be “other tongue” English).
FLOR	Free Learning Object Resources
HCI/CHI	Human computer interaction / computer human interaction
LLOR	Language learning object repository
LMS	Learning Management System
LO	Learning object
LOR	Learning object repository
MIT	Massachusetts Institute of Technology
MOOC	Massive Open Online Course
MOODLE	Modular Object-Oriented Dynamic Learning Environment
OER	Open Educational Resource
PLE	Personal Learning Environment
SCORM	Sharable Content Object Relational Module
VLE	Virtual Learning Environment
WBL	Web based learning

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Chapter 1: Introduction

1.1 Context of the research

This study is involved with providing an educational resource, an online learning object repository (LOR), for language learners in schools in KwaZulu-Natal, where the school population consists primarily of isiZulu speaking students taught by isiZulu speaking teachers (Balfour, 2004; EMIS, 2005). In spite of this, English is often the medium of instruction (MOI) preferred by parents, such is the hegemonic power of English in terms of signifying professional and economic advancement for their children (Naidoo, 2012). However, even twenty years after political liberation, schools in this province suffer from a scarcity of resources for language learning (Govender, 2011). The provision of text books, in particular, has been fraught with service delivery problems, as was evidenced by the discovery of "nearly 700 textbooks [which] were found dumped in Limpopo", in July 2012 (Roane, 2012).

Provision of school computers and Internet connections suffers also from lack of service delivery, yet most teachers and learners, even in the poorest rural areas, have access to the Internet via mobile phone technology (Mlitwa & Tshetsha, 2012). In contrast due to service delivery issues, Jansen reported that "workbooks for pupils gather[ed] dust", instead of being made available when required (Jansen, L. 2013). The latest generation of more economical mobiles - "mini" tablets and "maxi" cell phones - has put web surfing within easier reach of the urban and rural population of KwaZulu-Natal (Joyce, 2013: 9). Social media sites are popular with a citizenry which has virtually leapfrogged the industrial revolution (Nkwae, 2002; Fong, 2009a; Fong, 2009b) and moved from an oral, pastoral culture to a literate, street-smart urban one within the space of little more than a century. The rich media of the Internet then, could provide not only socialising and entertainment, but also language learning resources. However, while many

freeware language learning resources are in fact already available on the Internet, these are not catalogued or graded in ways which would make it easy for language teachers to select suitable language learning applications for their intended target group. Nor can teachers easily find, upload and disseminate for their learners (and colleagues) digital resources which they have found online or created themselves; in particular, resources which have relevance for their specific context, learner group and pedagogical purpose.

1.2 General aims and scope of project

This study, carried out within a critical realist orientation, offers a digital approach to providing language learning resources to learners in KwaZulu-Natal by developing a language learning object repository (LLOR). The purpose of designing and setting up a LLOR prototype was to find a way not necessarily to replace, but to augment and supplement the resources provided by text books. Margaret Archer's substantive theory of morphogenesis (Mutch, 2010: 507) was used to provide a social science framework within Bhaskar's critical realist meta-approach, termed "the philosophy of meta-reality" (2008: 2). Applying a morphogenetic approach brought the realisation that, for technological advances to be accepted as part of everyday educational practice, they needed to be included in the fabric of the existing social structures of educational practices. This had implications for the human computer interaction (HCI) aspects of the artefact, which was developed by both anticipating user needs at the outset and confirming these at intervals. Archer's emphasis on "historicity" (Archer, 1995: 83), or the gradual onset of social change - or pauses for consolidation - over epochs of time, meant that this study also considered the development of digital resources over a period of time. The artefact can then be viewed as being part of a larger social movement towards using digital resources along with the development of complex techno-systems (such as the Internet) which made this more feasible at an exponentially increasing rate (Aunger, 2010: 776).

The proposed project, a learning object repository (LOR), would facilitate the process of accessing computer assisted language learning (CALL) applications which might assist with the games, drills and repetitive routines needed in order to master a second language. The aim of this study was to offer teachers the option of accessing relevant language teaching/learning resources in one online collection, which would be vetted and organised for ease of retrieval. This would involve designing and setting up of an online Language Learning Object Repository (LLOR). In the course of this dissertation the project will be broken down into specific objectives after a review of the literature so as to identify the specific challenges experienced in English Second Language (ESL) learning and possible solutions which might be encompassed in the LLOR.

The proposed intervention took this form for the following reasons. Firstly, it was within the researcher's professional area of interest and expertise, as the area of interest encompassed the disciplines of librarianship, web programming, and curatorship. The researcher had over a decade of experience as a librarian (cybrarian), web developer/consultant and as a Knowledge Officer. He had worked on a large-scale wiki-based encyclopaedia, the Encyclopaedia of South African Arts Culture and Heritage (ESAACH), as a project assistant, developed content management systems (Plone) for use as an intranet, a web-accessible and searchable image database and an Intranet developed for the library of a prominent law company based in Durban. Next, while studying, he was appointed as a tutor of a course named Literature Studies, a first year subject of the National Diploma: Library and Information Studies; and it became obvious that the students having difficulties with the content were all second language English speakers. At that stage of their studies and post matriculation, remedial intervention such as tutoring had limited success in improving or repairing any of the deficiencies exposed thus far in their education. Thirdly, whilst national interventions such as revised assessment policies Curriculum and

Assessment Policy Statement (CAPS[1]) will possibly bear fruit later on, the reality is that there are already problems with the current learner population in the school system.

1.3 Main themes of the research

The main themes of this research include (1) the critical realist research orientation itself, as offering a deeper level of explanation for social phenomena, including (2) the development of technology in the fabric of social structure, for which Archer's substantive theory of morphogenesis provides some rationale. The latter relates to another main theme, (3) that of artefact development (i.e. artefact design), which requires a consideration of (4) human computer interaction (HCI). Individual human use of artefacts such as the LLOR designed in this study reflects on a smaller scale, society's interconnectedness with technology, which is how the themes mentioned above coalesce. All of the above themes are worked out in the specific context of (5) language teaching/learning in KwaZulu-Natal in the provision of digital resources, which is another major theme in the sense of being an attempt to address inequalities in education resulting from past apartheid education policies.

1.4 Definition of key terms and concepts

The key terms and concepts relevant to this study are discussed below, namely; English second language (ESL) in the context of KwaZulu-Natal, Learning Objects (LOs) as used in this study and the artefact that was created described as a Language Learning Object Repository (LLOR).

1.4.1 English second language

The majority of learners in KwaZulu-Natal schools are mother tongue isiZulu-speakers, and some might speak English as a third or even fourth language, sometimes referred to as their "other-tongue" (Chisanga and Kamwangamalu, 1997). However, the term English *Second* Language (ESL)

[1] CAPS, or "Curriculum Policy Assessment Statements", is part of the National Curriculum Statement, and was designed to give guidelines to educators as to how to carry out assessment in outcomes based learning.

is used for non-native speakers of English in KwaZulu-Natal in this dissertation, in keeping with much of the current research in the field (Govender, 2011; Dorasamy, R.S., 2012; Makhubu, 2012; Naidoo, 2012; Peat, SM, 2012).

1.4.2 Learning objects and repositories

A “learning object” (LO) can be defined as any device which can be re-used to facilitate learning in various contexts (Pratt, 2007b: 401). Their use is not necessarily restricted to computer applications, but in this study the term is used to refer to any digitised learning resource which might be used in different learning contexts. A “learning object repository” (LOR) is a “digital library” (Cervone, 2012) containing a general or specialist collection of digital resources in a web application (usually a database). A “language learning object repository” (LLOR) would then be a special collection of digital language learning resources, which would include, however, any teaching resources (or exemplars) used to facilitate language learning.

1.5 Value of the research

As mentioned above, while many freeware language learning resources are available on the Internet, these are not catalogued or graded in ways which facilitates easy access for language teachers according to their specific needs. It is thought that the proposed project, a learning object repository, would facilitate the process of accessing computer assisted language learning applications which might assist with the games, drills and repetitive routines needed in order to master a second language. The main objections to the use of learning objects in education (particularly language education) hinge around the so-called “usability paradox” (Krauss, 2004), which holds that a too-generalized learning application has little relevance for specific learning ends, while a too-specific learning application lacks the generalizability which would make it relevant in a number of very different contexts.

A user contributed model for the LOR was envisaged to make it an acceptable part of the social structure of the actual educator and learner group using it, i.e. users would take more readily to an artefact which reflected their own human values, desires and intentions(Lawson, 2008: 05). An “exemplar” content of different kinds of resources was, however, included to model for educators the kinds of resources they might themselves contribute (i.e. freeware Internet resources which they found, or “favourite” language games, drills, routines or lessons which they themselves had developed or inherited). The inclusion for users of the facility to contribute, while at the same time offering exemplars of what might be contributed resolves some of the issues inherent in the “usability paradox”.

This is because it is the *principle* (of not just the Language Learning Object repository or LLOR, but all LORs of this type) which is “re-usable”, not so much the disciplinary or educational content. The content is, of course, intended to be useful, but more in terms of modelling what kinds of input educators might add themselves. The LLOR described here - and in fact all LORS based on a similar model - can be adapted by LOR developers to fit other educational contexts, audience and purposes. The LLOR is in fact only a pilot, and it is not so much an issue that it will work for its intended purpose but that it models other such applications. Whether these will work or not will depend partly on their inherent usability and partly on the relative usefulness of their content as geared to suit various learning contexts.

1.6 New contribution to knowledge

Online repositories for various areas of learning (including language) are currently in use overseas and locally (e.g. Thutong). However, this is the first attempt to contextualise and simplify a LLOR for a local South African context with a specific demographic and specific language learning needs (i.e. for English) by supplying them with a template (the structure provided by the customised learning management system) for accessing and contributing to varied resources at various levels. This project is original, then, in the sense of being geared for use in KwaZulu-Natal, in containing freeware to which

users can contribute, and in being restricted to language learning. To follow on this point, artefacts such as the LLOR designed in this study, while technical in nature, are in fact designed with their operation in social contexts in mind (Lawson, 2008: 5-6), and need to be designed in terms of how they will fit into the complex system of relations constituting social structure in specific contexts. Using a critical realist research orientation with reference to theories of social structure is a relatively new approach to artefact development.

1.7 Overview of the dissertation

The rest of the thesis chapters are summarised as follows:

Chapter 2: Literature Review

An overview of Computer Aided Language Learning (CALL) as applied to second language learning is first given, followed by a summary of some of the recent research findings on language learning in KwaZulu-Natal. Next, the chapter looks at the potential of CALL for second language learning in KwaZulu-Natal, and suggests how LLORs can be used as resources for second language learning. An account is then given of the technologies which have paved the way for the development of the LLOR follows, namely; repositories, learning objects and open-source software. The chapter concludes with a summary of the general aims of this research initiative as well as the specific objectives used to achieve this.

Chapter 3: Research Orientation

Chapter 3 gives an overview of the research orientation, the critical realist philosophy, looking at its role as a meta-theory which contains ontological and epistemological elements explaining the constituents of the social world. Critical realism is shown to require discipline-specific theoretical frameworks or subject-specific methodologies to carry out research in specific areas. Next, the nature of critical realism as research orientation is discussed, showing its focus on causal mechanisms, and giving the rationale for adopting a critical realist approach for this study. After discussing the critical

realist ontology, Bhaskar's definition of social structure is clarified as a preamble to Archer's theory of morphogenesis/morphostasis stasis (social change/retention). Archer's theory of morphogenesis, as explaining social change, is then discussed, as well as the morphogenetic/morphostatic cycle. After attempting to clarify the role of technology, in particular, the role of ICT, in social structure, the chapter positions the artefact to be developed in terms of potentially transforming the social structure of teaching and learning in KwaZulu-Natal.

Chapter 4: Methodology

Chapter 4 first discusses the application of the morphogenetic approach as applied to artefact development, referring to previous ICT artefact designs adopting Archer's theory, and showing how it differs from the traditional action research cycle. Next, an overview is given of the design and piloting of the LLOR, showing how this is linked to cumulative technological developments as well as associated changes in social structure. Chapter 4 then describes the phases involved in the larger morphogenetic cycle contextualising this study, as well as the phases and sub phases) involved in the methodology. The different levels involved in the methodology are identified as relating to technical, systemic and deeper theoretical levels. The methods used for artefact testing are described, as well as how artefact design and artefact testing will be dealt with in subsequent chapters

Chapter 5: Artefact Design

Chapter 5 deals with the process of artefact design for a specific intervention, the Language Learning Object Repository (LLOR). In order to design and set up an online learning object repository for language learners in schools in KwaZulu-Natal and install various freeware re-usable language learning objects (RLOs) in it, it was necessary to identify the social need for which the LLOR catered, and the specifications which would address those needs. The social needs were identified in the literature dealing with literacy in KwaZulu-Natal. The design procedure followed is shown to be mainly informal, which meant that the specifications were done on behalf of, rather than in

collaboration with the intended audience. The resulting specifications are then given and the rest of the chapter deals with the cycles leading to the development of the LLOR.

Chapter 6: Artefact Testing

Chapter 6 deals with artefact testing of the LLOR to fulfil objective 3. (testing out the operation of the LOR in terms of teacher and learner access to language learning resources) and 4. (to obtain responses from users in terms of its potential for facilitating language learning in schools in KwaZulu-Natal). This chapter then evaluates the artefact in terms of its usability by analysing data obtained from two different sectors, quantitative data obtained from academic support staff with some experience in digital learning and related technology, and qualitative data obtained from educators. Then the chapter discusses end user feedback obtained from various role-players, including educators at subject advisor and teacher training level, and those working in schools.

Chapter 7: Conclusions and Recommendations

This chapter shows how fulfilling the specific objectives resulted in addressing technical, systemic and social structure issues, and draws conclusions based on the findings in these areas. After reflecting on the research process and its outputs, recommendations are made as to the future development of the LLOR.

Chapter 2: Literature Review

2.1 Introduction

The general aim of this research project was to set up an online learning object repository (LOR) for language learners in schools in KwaZulu-Natal. An overview of Computer Aided Language Learning (CALL) as applied to second learning is followed by a summary of some of the recent research findings related to language learning in KwaZulu-Natal. Next, the chapter looks at the potential of CALL for second language learning in KwaZulu-Natal and suggests how LLORs can be used as resources for second language learning. An account is then given of the technologies which have paved the way for the development of the LLOR follows, namely; repositories, learning objects and open-source software. The chapter concludes with a summary of the general aims of this research initiative and the specific objectives used to achieve this.

2.2 CALL as applied to second language learning

The case for the use of CALL to improve second language learning (acquisition) is not conclusive (Johnsen & Taylor, 2002: 15). Most researchers would agree that CALL can be used effectively in the right circumstances, but as Bancheri (2006) warns, "it is also important to place the computerized activities strategically within the framework of the lesson" (Bancheri, 2006: 44). As Donaldson and Haggstrom comment:

> Research has shown that the simple fact of giving students easy access to the target language and culture via the new technologies is not, in itself, necessarily more effective than simply handing them a foreign-language dictionary (Donaldson & Haggstrom, 2006: viii).

The above point warns against thinking that technology can be used to replace teachers or teaching. It is within this understanding that the proposed LLOR is positioned, not as an alternative to present initiatives but rather to support and augment existing interventions.

> Successful vocabulary learning depends upon good teachers.

> Although students can learn a great deal of vocabulary on their own, particularly by reading, the teacher is in the best position to organise valid CAL practice to lead to vocabulary development…(Cameron, 1989: 17).

In answering the question, "Can computers aid vocabulary learning?" the point that Computer Aided Learning (CAL) can be useful to aid vocabulary is made, although with the rider that this is still dependent on there being good teachers who are willing to use the technology.

While ESL teachers are stereotyped as being technophobic, Lam's findings suggest that it is the institutions, rather, which are "overly 'technophilic' in their rush to obtain the latest innovations without considering the needs of teachers and students" (2000: 390). There is also the issue of teachers fearing that they will be replaced by computers, which has not so far proved to be the case; blended learning, which augments rather than replaces, traditional instruction, "can significantly improve the [language] learning experience" (Marsh, 2012: 4).

Johnsen and Taylor (2002) warn against viewing technology either with an alarmist "replacement" view, or as "material abundance" at the expense of moral and ethical concerns, but advise a balanced view of the introduction of technology:

> With this essay we seek a prudent criticism of technology in classroom life that neither falters on a despairing pessimism that assumes technology to have already foreclosed on the human option nor apotheosizes a nostalgic return to an earlier day in our history when technology seemed less pervasive and threatening (2002: 12).

According to Henessy, Ruthven and Brindley (2005), a considerable amount of research has been conducted on learners' perceptions of the introduction of ICT, but relatively little has been done about teachers' perceptions of assimilating ICT into their curriculum. As Henessy et al. found in their study:

> Experienced teachers who are used to other approaches and tools can feel uneasy about using ICT in the classroom, even though many possess technical skills: 'Two colleagues … let's just say women of my age … are a bit more resistant still. … They're both very confident users of IT and both use it themselves a lot, but not so confident with using it with pupils' (Hennessy et al., 2005: 170).

However, Lam's study suggests:

> …the `technophobia' of teachers is a misconception and that their decisions regarding technology use are not based on a resistance to or an adoration of technology, but rather on their beliefs about the benefits of the technology for their students. If teachers choose not to use the technology provided to them, it is not because they fear technology but, rather, because they are not convinced of its usefulness (2000: 424).

Zhao and Conway point out that the idea of teachers as "Luddites" corresponds with "traditional images of the teacher as the preeminent source of information, but that teachers can also be viewed as "gatekeepers" or "designers". As gatekeepers, it is *teachers* "who decide whether, what, and how technology gets used in classrooms" as designers who "design their own teaching environment with a variety of technological tools to facilitate knowledge construction" (Zhao & Conway, 2001: 21).

Yet it would be dangerous to assume that ICT skills can easily be transferred to learners by confident ICT users without paying attention to the pedagogy involved (Lam, 2000: 400). The emphasis should be on transformative processes which blend the best of the current teaching methods with the best technological tools whilst focusing on "train-the-trainer" and up-skilling.

2.2.1 The ESL teaching/learning situation in KwaZulu-Natal

Table 2.1 summarises some of the recent research findings related to language learning in KwaZulu-Natal. Naidoo's (2012) study focuses on the possible problems posed by the increasing trend of isiZulu-speaking parents sending their children to English medium schools, as English is now viewed as the "power language" of education and professional advancement. In this study it was discovered that despite legislature supporting the choice of MOI.

Table 2.1 The second language learning context in KwaZulu-Natal

Title of study	**The hegemonic position of English as a medium of instruction at primary school level in KwaZulu-Natal, and its impact on parents' preferences of schooling for their children**
Despite legislature supporting the choice of MOI for parents, most isiZulu-speaking parents chose schools where the medium of instruction was English and which did not offer mother tongue instruction in isiZulu.	
Citation	**(Naidoo, 2012)**
Title of study	A self-study of curriculum design for the teaching and learning of isiZulu as an additional language in primary schools in the *Mayebabo!* series
The quality of the teaching of isiZulu as an additional language in primary schools is problematic.	
Citation	**(Soni, 2012)**
Title of study	A critical realist approach to literacy acquisition and development, with specific application to teacher training and support in primary education in KwaZulu-Natal
The study's focus was on reading because this was seen as a fundamental aspect of literacy acquisition and development at primary level	
Citation	**(Govender, 2011)**
Title of study	The impact of English as medium of instruction on the academic performance of second language learners in the Further Education and Training band at schools in KwaZulu-Natal
In investigating the impact of English as the medium of instruction on the academic performance of ESL learners Dorasamy concluded that it was not English per se which was the problem but ineffectual use of the language.	
Citation	**(Dorasamy, R.S, 2012)**
Title of study	Understanding the influence of a second language on the academic performance of learners in Information Technology: a case study of isiZulu-speaking English second language learners in KwaZulu-Natal
The use of English as the medium of instruction for second language users of English was investigated as a possible factor in the lack of understanding of computers.	
Citation	**(Njobe, 2007)**
Title of study	Integrated arts as transformational medium of instruction in KwaZulu-Natal schools: a narrative self-study
It was found that using integrated arts[2] as instructional media for second language learners communicated concepts more effectively than traditional teacher talk alone.	
Citation	**(Peat, SM, 2012)**

[2]The term "integrated arts" refers to "the use of the visual arts, drama, dance and music" as instructional media (Peat, 2012: 1).

for parents, most isiZulu-speaking parents chose schools where the medium of instruction was English and which did not offer mother tongue instruction in isiZulu (i.e. schools which were previously accessible only to the White or Indian race groups). In spite of the fact that many of their children are not fluent in English, isiZulu-speaking parents prefer these "privileged" English medium schools because of the Apartheid legacy, which means that schools are still resourced unevenly (although Apartheid was abolished in 1994).

It was discovered that code-switching that was used by teachers with inadequate competence impeded ESL learner's "acquisition of content knowledge". As many of these children are not fluent in English, their academic development, as well as their acquisition of English, may need to be carefully scaffolded and supported by various interventions, and Naidoo provides a model to lead parents through the options of making a choice of school and what kinds of support might be needed. The LLOR developed in this study might be considered as a scaffolding mechanism for developing English language proficiency. Dorasamy's (2012) study showed how lack of English proficiency affected academic performance in schools, in other words, the results of parents selecting schools for children not fluent in English without ensuring that they had support systems in place if the schools did not offer these.

Dorasamy (2012) investigated the impact of English as the medium of instruction on the academic performance of English second language learners. It was concluded that it was not use of English per se which was the problem but ineffectual use of the language itself. Dorasamy found that issues such as lack of interaction with target language learners, code-switching and teacher competence impacted on academic performance more than the chosen language.

The focus of Govender's (2011) study was on reading because this was seen as a fundamental aspect of literacy acquisition and development at primary

level. Its purpose was to establish the state of current literacy teaching and learning practices in formal education. It was found that teacher competence was negatively impacted on by factors such as inadequate teacher training, impact of teacher union activity, poverty and HIV/AIDS. Issues found at the Intermediate Phase education level include the problems of insufficient teaching staff numbers and insufficient numbers of competent and trained staff; lack of sufficient support for African language learners; large class sizes; lack of resources; and lack of quality leadership in schools"(2011: iii)

Govender's (2011) study showed that development of English reading skills was negatively impacted on by factors such as inadequate teacher training, impact of teacher union activity, poverty and HIV/AIDS, also "lack of resources". The LLOR might assist with these resources, as well as assisting teachers to upgrade their skills and teaching methods.

Not only is English proficiency a problem in South African schools, but indigenous languages fare no better, as cultural diversity in racially desegregated schools is not accommodated by teachers. Soni (2012) mentions that the quality of the teaching of isiZulu as an additional language in primary schools is problematic, and that teachers are not equipped to teach isiZulu as a first or second language. Soni's study reveals that isiZulu itself is not taught effectively in the so-called "privileged" (ex-model C) schools for Whites and Indians, confirming that cultural diversity in racially desegregated schools is not being accommodated by teachers. The LLOR might then also be used in future projects to assist the learning of isiZulu as an Additional Language.

Peat (2012) found that learners of a different culture to that of the educator found difficulty in understanding concepts taught via the medium of a second language. In view of the dearth of language skills, Peat's solution to communicating concepts in South African schools was to use integrated arts (e.g. the visual arts, drama, dance and music) as instructional media. Peat found that using integrated arts as instructional media not only communicated concepts more effectively than traditional teacher talk on its own, when

translated into different cultural milieus, but also assisted with developing English language proficiency. The integrated arts used by Peat have a parallel in the rich media available for Internet instruction, and it is hoped that the passion for learning aroused by the visual arts, dance and drama can be stimulated in similar fashion by the multimedia used in interactive learning applications on the LLOR.

In Njobe's (2007) study, the use of English as the medium of instruction for second language (i.e. isiZulu-speaking) users of English was investigated as a possible factor in the lack of understanding of computers. In particular the user interface of the computer application was targeted for localization into isiZulu to test if the hypothesis was correct. It was found that users who had access to firstly the isiZulu interface, and then the English interface, performed better than those who had access to the English interface only. Njobe's study offers the caveat that second language learners of English in KwaZulu-Natal may need an isiZulu interface in the LLOR. Njobe's findings suggest that this will not only make it easier to access the resources on the LLOR but also to understand and become familiar with the working of the actual application itself.

Demographic surveys and overviews reveal that, while the school population in KwaZulu-Natal consists primarily of isiZulu-speaking students taught by isiZulu-speaking teachers (*The languages of South Africa*, 2009), English is the predominant medium of instruction (Balfour, 2004; EMIS, 2005). Moreover, teachers themselves are as often not fluent in English; up to 80% were noted as "not fluent" (EMIS, 2005). Almost twenty years after political liberation, schools in this province suffer from a scarcity of facilities (e.g. classrooms) and traditional resources (e.g. books). Even when hard print resources are available, funds need to be readily available for acquisition, and setting up and maintaining school libraries, while a laudable aim, is labour intensive and takes up space which could be used for classrooms. Moreover, it is not feasible to maintain a large selection of copies of suitable books (whether text books or recreational reading), which then can rapidly become dated in terms of changing youth interests (Department of Education, 1997). While the studies

conducted on Literacy acquisition and Language Learning in KwaZulu-Natal does not necessarily focus on CALL applications or offer CALL solutions, they provide a snapshot of the types of problems faced within the broader landscape of education in South Africa. This study is thought to have relevance for language learning in other SA provinces and other countries; however, it is focused on this geographical area.

2.2.2 Potential of CALL for second language learning in KwaZulu-Natal

As mentioned previously there are already some initiatives that are or have been in operation, and these are summarised below. The government of South Africa has indicated its support and awareness of the need to up-skill teachers in order to make e-Learning an achievable method of instruction in the future. The White Paper on e-Education includes a comprehensive strategy that will address amongst other things, "ICT professional development for management, teaching and learning" (Africa, 2004: 25).

There are other initiatives operating at national or international scale, such as Thutong (Assan & Thomas, 2012), which is an educational resource supported by the South African Department of Basic Education (DOBE), or Commonwealth of Learning, Learning Objects Repository Software (http://www.col.org/lor).

2.3 LLORs as a resource for second language learning

The emergence of desktop computing initially appeared to offer ready solutions to a whole range of problems in education in general, such as access to resources (e.g. books, charts, and other learning materials) and to a lesser degree, assessment, as mentioned below by Alessi and Trollop.

> The early days of instructional computing saw much excitement for its potential and many prophecies of great educational improvement through computer-based instruction (Alessi & Trollop, 1991: 2).

It was anticipated that technology in the form of computers might resolve these challenges. In the field of computer assisted approaches to language learning i.e. CALL), the possibilities seemed endless, especially in terms of lightening the classroom drudgery of exercises and drills.

2.3.1 Use of electronic resources in education

However, it became apparent that the use of electronic resources is not without problems. In earlier uses of computers for CALL, Kenning and Kenning commented on computers made "a greater contribution to marginal rather than to central elements" of language learning (Kenning & Kenning, 1983: 90).

As Pratt points out:

> …there is a tendency to overplay the benefits of using computers to solve educational problems, and to underplay some of the real problems, such as student after-hours access to computers and the need for prior learning in this area, both serious issues for educationally disadvantaged ESL learners who are most in need of individual tuition (2007a: 8).

However, while there are disadvantages associated with using computer programs rather than human teacher or tutors, there are also a number of advantages offered by computer mediated learning. Computerised learning aids are more convenient and more time- and cost-effective than human tutoring, and can also be distributed more cheaply and easily to students by the institution than a workbook. In addition:

- There is no limit to the number of learners a tutor program can accommodate, whether sequentially or at the same time.
- A tutor program does not become tired or irritable no matter how many times the same question is asked or the same procedures are rehearsed.
- The user can drop a topic or break off without appearing to reject a human tutor's advice with the result of offending him/her.

- Students appear to enjoy using computers, and to prefer them to formal “live” instruction.
- A computer program is not generally perceived as judgemental by learners in the same way that human teachers or tutors are, and is controlled by the learner, not the teacher (Pratt, 2011: 4, slightly adapted).

According to Alessi (1991), computer-based drills can be as easily accomplished through workbooks or flashcards as through computers. However, computers have the advantage of repeatability (i.e. being used over and over again) without requiring additional materials.

The learner can therefore access the same drill for an infinite number of times without requiring more paper or board. Alessi goes on to identify “five major types of computer-based instruction programs, tutorials, drills, simulations, games and tests”, and provides the following definitions:

- Tutorials - Programs that generally engage in the first two phases of instruction…guiding the learner in initial acquisition.
- Drills and games - practice for fluency and retention, [whilst] [t]ests almost always represent the last phase, assessing the level of learning (Alessi, 1991).

Simulations have evolved and advanced substantially from their origins in scope and technology, yet their underlying principles remain essentially the same. They generally follow a known sequence with multiple pathways depending on each choice that is made. Simulations are sufficiently adaptable to the different disciplines (such as science, the social sciences and the arts), to business practices (such as project management and stock-market brokering), and geographical forecasting (such as climatology and meteorology). According to Alessi, “In an educational context, a simulation is a powerful technique that teaches about some aspect of the world by imitating or replicating it” (1991: 119).

Aldrich further refines the meaning of educational simulations by dividing them into subtypes as follows. Using the term “Sims”, he suggests that these come in genres (e.g. “first-person shooter and branching stories”), and then goes on to list ten possible contenders for a common definition of the term “Sims” as listed below. These are not ranked but listed from 10 to 1 with “Sims” being chosen as the most suitable name for “Educational Simulations”, which can be used universally (Aldrich, 2009: xxxii, slightly adapted):

10. Virtual experiences
9. Games
8. Simulations
7. Social impact games
6. Practiceware
5. Game-based learning
4. Immersive learning simulations
3. Educational simulations
2. Serious games
1. Sims

2.3.2 Learning object repositories

It is worth reflecting that whilst digital repositories could include any digital content that is stored and made accessible, it is worth grouping types of digital repositories according to the characteristics they have. The JISC “infoKit” provided by Northumbria University has done this exercise, namely defining the terms such as repository and then grouping these according to their types. The three main types offered are; digital repositories, institutional repositories, and open access repositories (Infonet, 2011).

A learning object can be defined as: “any device (e.g. thing, electronic device, program) which can be re-used to facilitate learning in different contexts” (Pratt, 2007b: 401). Pratt points out that the use of learning objects is not restricted to computer applications:

> While learning objects are connected with technology-enhanced learning, they are not limited to any particular technology (an abacus could be said to constitute a reusable learning object). The user’s

> model [of written composition] is a type of re-usable learning object, as is the writing tutor program on which it is based (2007b: 401).

However, as Downes comments, “there is no consensus on the definition of LOs” (2004: 20). This is borne out by McGreal (2004: 11), who points out that some definitions focus on the “learning” aspect of LOs, discounting the digital aspect, while others focus on the digital aspect only. This study includes both aspects: the term learning object is used in this dissertation to refer to any digitised learning resource which could be re-used in different learning contexts.

According to Nash, the term “learning object” (i.e. in the digital sense) is derived from “the notion of “object-oriented” computing and programming, which suggests that the ideal way to build a computer program or anything digital is to assemble it from standardized, small, interchangeable chunks of code” (Nash, 2005: 217). These small or “granular” objects can then be contained in what Nash terms “meta-objects” (2005: 217), which could be LMSs, for example, Blackboard, WebCT and Moodle. The more consistent the granularity, the more effectively these objects can be incorporated in many different courses (Downes, 2005). While granularity is desirable, the usability paradox is a limiting factor in the degree of granularity achieved (Krauss, 2004): a learning object which is too specifically designed to serve a local need cannot easily be used in other contexts, while one which is too general in application may not meet a specific local need (Parkin, 2005). Moreover, as Krauss (2004) points out, “there comes a point where breaking an object down to its most “common elements” is not desirable or practical”.

It must be emphasised, however, that the above issues relate to the successful combination of LOs in specific courses or courseware. The LLOR envisaged here is more in the nature of an archive and repository from which teachers and learners can browse for specific applications which might provide a resource to meet a specific teaching/learning need at any given time, much as is the intention of the CAREO project piloted by Education Alberta (Friesen & Magee, n.d). In this study, then, categorisation and ease of access is more important than granularity or conformity of objects, and object format is not a key issue

inasmuch as (a) the object can be stored and accessed within the format of the LOR and (b) it is made clear to the user in which format it can successfully be run.

A key issue in the sharing of learning objects is the development of "taxonomies and systems for organizing and retrieving content" (Nash, 2005: 218). One of the research problems, then, will be to categorise items so that they are easy to identify in terms of appropriateness/fitness for use. The learning objects contained in the language LOR developed in this project must be easily usable (i.e. not confusing to newly-literate users), sustainable (i.e. continue to be in use, when offered free), regularly monitored (i.e. so that objects added remain for educational use) and maintained (i.e. kept in working order). While similar repositories are being planned elsewhere, for example in the CAREO project (Friesen & Magee, n.d), this project is original in the sense of being geared for use in KwaZulu-Natal, in containing freeware to which users can contribute, and in being restricted to language learning.

2.3.3 Open source

The emergence of alternatives to proprietary software and especially operating systems can be traced to the release of the Linux kernel first in 1991, which was initially not licensed as a free software licence but was later re-licensed under the GNU General Public License in February 1992. However, this was preceded by the development of Unix ("Unics", as it was first named), largely attributed to a four week (1 month) solitary effort by Richard Stallman (see http://stallman.org/). It is important to appreciate that the proliferation of Open Source software (including operating systems, system software and application software) gained momentum after the release of the first Linux kernel.

The most important development that has relevance to this study is that of the Apache HTTP Server and of course the precursor to that which was the emergence of the World Wide Web (WWW) which was set up and maintained by the mechanism provided by the techno-system of the Internet. As Leon offers, "Linux/GNU, an essentially free OS, has hastened the proliferation of

Web servers…" (Mark, 2000: 62) In an interview Stallman remarks that, "I believe the World Wide Web was first implemented as free software." (2000: 62).

While software for web development and hosting was already available, these were virtually inaccessible to any users except the more technically advanced. For the emergence of content management systems (CMSs) such as the ones which were considered for setting up the LLOR (e.g. Joomla, Moodle and PHP Nuke), it was necessary for three components to be "packaged" in a web-publishing environment. These three components constituted the Apache HTTP Server, the MySQL database and the PHP programming language for dynamic pages, a collection which came to be known as the LAMP stack. As Lawton explains, "The LAMP stack is a loose collection of open source components that developers can combine to build various types of Web applications" (Lawton, 2005: 18).

According to Lawton, "the LAMP stack, which includes the Linux operating system, Apache Web server, MySQL database, and scripting languages Perl, PHP, and Python" has been gradually gaining acceptance in mainstream corporate software development (Lawton, 2005: 18). Through web browser technology the Internet has in many ways managed to accelerate the opportunity and means to create learning objects, and the development of the LAMP stack was a critical stage in making this possible.

Web programming and web design, previously separate skill-sets, have recently morphed into one skill, and, with the evolution of scripting languages such as PHP, Python and Perl, have reduced the need for web developers to be programmers or, in most cases, to write custom scripts. There are parallels here with the process whereby learning objects can be "assembled" into new or purposeful designs. It is relatively simple for non-technical experts to set-up powerful websites using ready-made scripts and wizards, and the maintenance of these sites can be done without a high degree of technical expertise. As the

number of user's increase more demands are made on the web application, which means that more technical expertise is needed for its maintenance.

2.4 Conclusion

This chapter has looked at the recent research findings on language learning in KwaZulu-Natal, and has noted the lack of teaching and learning resources, as well as the potential of using CALL for second language learning. LLORs were suggested as potential resources for second language learning. The technologies which have paved the way for the development of the LLOR can be seen to have made these a viable educational option for relatively unskilled users.

2.4.1 General aim of the research

The general aim, as mentioned in Chapter One, was to set up an online learning object repository (LOR) for language learners in schools in KwaZulu-Natal. This would offer solutions to the lack of teacher training in language teaching, and offer a renewable source of contextualised materials, which would go some way towards solving the logistical problems involved in providing traditional type resources such as text books. The artefact would also model an innovative mode of teaching in a digital medium setting.

2.4.2 Specific objectives

To accomplish the general aim, the following specific objectives were formulated:

1. To design and set up an online learning object repository (LOR) for language learners in schools in KwaZulu-Natal;
2. To install various freeware re-usable language learning objects (RLOs) in the LOR;
3. To test out the operation of the LOR in terms of teacher and learner access to language learning resources;
4. To obtain responses from users in terms of its potential for facilitating language learning in schools in KwaZulu-Natal.

Chapter 3: Research Orientation

3.1 Introduction

Chapter 3 first gives an overview of the research orientation, the critical realist philosophy, which is gaining in popularity in IS research, looking at its role as a meta-theory containing ontological and epistemological elements explaining the constituents of the social world. As a meta-view, critical realism is shown to require discipline-specific theoretical frameworks or subject-specific methodologies to carry out research in specific areas. Next, the nature of critical realism as research orientation is discussed, showing its focus on causal mechanisms in stimulating events (or creating the potential for social action). The rationale for adopting a critical realist approach for this study is then given. As Bhaskar's most significant contribution in the realist philosophy is acknowledged to be his work on re-defining ontology, the critical realist ontology is next discussed. Next, Bhaskar's definition of social structure (which is in itself a problematic concept) is clarified, as a preamble to Archer's theory of morphogenesis/stasis (i.e. of social change/retaining status quo). The chapter then deals with Archer's morphogenetic approach, which is shown to be a substantive theory operating within Bhaskar's philosophy. Archer's theory of morphogenesis, as explaining social change, is then discussed, as well as the morphogenetic/static cycle. After attempting to clarify the role of technology, in particular, the role of ICT, in social structure, the chapter ends in positioning the artefact to be developed (i.e. the LLOR) in terms of potentially transforming the social structure of teaching and learning in KwaZulu-Natal.

3.2 Overview of the critical realist philosophy

Critical Realism, a philosophical approach attributed mainly to Roy Bhaskar, recognises "the reality of the natural world as well as the events and discourses of the social world" (Wikgren, 2005: 14). Margaret Archer (1995; 2002) and Rom Harre (1986) are also acknowledged as having made major contributions to critical realism. "The term 'critical realism' arose by elision of the phrases

'transcendental realism' and 'critical naturalism'" (Bhaskar, 1998a: ix). According to critical realists, social science should consist of a "practical intervention in social life" (Bhaskar, 1986: 169), thus critical realism supports the concept of social transformation by praxis. Critical realism is a philosophy of science and as such it offers a meta-theory, that is, one which embraces ontological and epistemological elements, which tells us what structures, entities and mechanisms make up the social world (Danermark, Ekstrom, Jakobsen & Karlsson, 2002: 20-21).

It must be stressed that Bhaskar's philosophy provides an overview, or meta-theory, which prepares the ground for specific areas of research, and is often referred to as an "under-labourer" (i.e. labourer who clears a plot of land in preparation for building operations to take place). It is gaining ground in social science research (Buch-Hansen, 2005: 59), and according to de Vaujany, including in Information Systems (IS) and Information and Computer Technology (ICT) (De Vaujany, 2008: 5). Reporting on occurrences of "critical realism" in an academic literature study, De Vaujany (2008: 4-5) calculated the "penetration level" of critical realism at 44 per cent in Economics and 28 per cent in Management, of which 6.1 per cent comprised information systems research.

Carlsson (2009: 811) recommends critical realism as "an alternative to traditional positivistic models of social science as well as an alternative to post-approaches and post-theories". This is because, as Carlsson points out, critical realism holds "that social reality is not simply composed of agents' meanings, but that there exist structural factors influencing agents' lived experiences". He adds: "critical realism starts from an ontology which identifies structures and mechanisms through which events and discourses are generated as being fundamental to the constitution of our natural and social reality." The critical realist ontology possesses a dimension that is not directly observable, as reality has powers and mechanisms that, although not visible, can be experienced indirectly through their ability to make things happen in the world. Critical realist research seeks to "investigate and identify relationships and non-relationships,

between what we experience, what actually happens, and the underlying mechanisms which produce the events in the world" (Danermark, 2002).

The critical realist philosophy advances an explanation of reality that not only distinguishes the world from our experience of it, but also includes an ontology that comprises three differentiated levels of stratification, which are loosely nested into one another, as will be explained in the section on its ontology below (Bhaskar, 1978: 56).

3.3 Critical realism as research orientation

Ayers (2011) explains a critical realist perspective as one that is guided by the need to explore actual processes and events, which result from complex interactions of causal mechanisms in the domain of the real. According to Sayer (2000: 12) critical realists seek to identify what is necessary, possible as well as potential in the world, not being determined by "a regular succession of events" but rather via the identification of causal mechanisms and the conditions necessary for the activation of these. The "possible" and the "potential" implies that our experience or understanding may be fallible, owing to the "possibility that some powers may exist unexercised, and that what has happened or been known to have happened does not exhaust what could happen or have happened" or that two mechanisms may counteract each other and so their effect may not be visible. Furthermore, these mechanisms may retain the potential to yield effects even when that potential is not activated. According to Ayers, such powers are termed "transfactual" (2011: 349).

Knowledge, according to Bhaskar (2008: 5-6) "is a social product, produced by means of antecedent social products; but that the objects of which, in the social activity of science, knowledge comes to be produced, exist and act quite independently of men". Because "social phenomena are what they are by virtue of the internal relations they have to other phenomena" (Danermark et al., 2002: 97), knowledge of the social reality can be attained by exploring the transfactual conditions. This is possible via retroductive inference, which enables looking beyond what is empirically observable for the events and phenomena being

studied, by reconstructing and detecting the preconditions that make certain social situations possible. According to Bhaskar (2008b: 217): “scientifically significant generality does not lie on the face of the world, but in the hidden *essences* of things” (my emphasis).

A further feature of critical realism is that of “emergence” in the world, which occurs when “two or more features or aspects give rise to new phenomena, which are irreducible to those of their constituents”. Emergence in the social world, according to Sayer, is frequently relative to the roles and identities of people as well as the accompanying powers attached to their positions, relations and contexts. Rather than our being passively shaped by our contexts, the contexts in social systems are derived from our interpretation of the situations (Sayer, 2000: 13).

With reference to this study, critical realism has been used by researchers in the area of literacy, both to provide an overview of literacy acquisition and development (Govender, 2011), as well as to model written communication to provide specific learning interventions in the form of composition software as was done with “Introducing newt@dut - a mixed mode writing clinic at a multicultural university of technology” (Pratt, 2007b; Pratt, 2007a). Govender explained the deficit in literacy acquisition and development in KwaZulu-Natal by investigating the social mechanisms impacting on educational delivery, comprising social systems, structures and specific interventions (Govender, 2011: 63-66). Factors she identifies as being problematic were inadequate teacher training; lack of sufficient support for African (i.e. ESL) language learners; and lack of resources (2011: iii). Pratt modelled the social system involved in written communication to arrive at the generative mechanism involved in composing, categorising it as an algorithm which could be used as the basic for a writing tutor program. The LLOR developed in this study is in response to the problems in the KwaZulu-Natal education system, noted by Govender, and provides a learning object repository intended to address a learning need in a practical way.

3.4 Rationale for adopting a critical realist approach

Critical realism was used as the research orientation for this project because it combines depth insight into social processes with a pragmatism which seeks to improve the quality of life by practical means (Bhaskar, 1986: 169). It is also a more subtle tool than either positivist or postmodern approaches, as Carlsson (2009) comments above, because, on the one hand, the system comprised in the artefact is viewed in the perspective of the social system which generates a need for the "solution" provided by the artefact, and, on the other, the reality of both the social system and the artefact are not dependent on "discourse", but "real" events and experiences triggered by a complex, layered causality. Critical realism also distinguishes between different modes of reality in ways which positivism and postmodernist approaches do not. Social structures (such as those governing the South African educational system) are "socially real", and computers (and computer systems such as the LLOR designed in this project) are "artefactually real" (Fleetwood, 2005: 2). The category "artefactually real" in turn comprises three aspects, material, ideal and social: ICT has a material aspect in terms of hardware and infrastructure, an ideal aspect in terms of how providers and users conceptualise it, and a social aspect in terms of how it is used in a social setting. This means that adoption of the LLOR as a language learning resource is dependent on the availability of the necessary ICT equipment and infrastructure, perceptions of educators and learners, and integration of ICT into the social structure of teaching/learning in the given context. These aspects are interlinked, and contribute in combination to the situational logics of this kind of educational innovation.

3.5 The critical realist ontology

Bhaskar's contribution to philosophy is generally acknowledged to be in "re-thematising ontology and giving it a certain new content or shape" (Norris, 1999: 1). In doing so, he provided an explanation of reality that not only distinguishes the world from our experience of it, but has developed an ontology comprising three differentiated levels of stratification, each nested into the another (2008: 46-47). Critical realism has a tripartite ontological structure, divided into the

"domain of real" the "domain of actual" and the "domain of empirical" (see Table 3.1).

The "domain of real" consists of events (i.e. occurrences) and human beings' experiences of these. The focus in critical realism is on causality, and the term "mechanisms" refers to the underlying causes of events (whether triggered by natural causes, social systems or human agents). While events and experiences can be observed directly by human beings, the existence of mechanisms can be postulated only, using "transcendental" means (Bhaskar & Lawson, 1998: 5-6). The "domain of actual" refers to experiences and events (as observed), which, Bhaskar suggest, often do not reveal the underlying deep level causes (i.e. mechanisms, which can be inferred only). The "domain of empirical" refers to human knowledge, that is, thoughts or theories about the nature of things.

Table 3.1 Bhaskar's three domains (Table 1.1 in Bhaskar, 1978: 56)

	Domain of Real	Domain of Actual	Domain of Empirical
Mechanisms	✓		
Events	✓	✓	
Experiences	✓	✓	✓

While the domains or real and actual have "real world" existence, the domain of empirical has a mental existence only; the distinction between these modes is explained in the terms "transitive", that is the object of thought, and intransitive, or that which exists independently of thought (see Bhaskar, R., 1979: 9-14). The distinction between the transitive (changing) and intransitive (relatively enduring) dimensions of existence in critical realism emphasises the point that we should not conflate what can be known about the world with our experience of it. Bhaskar (2008: 28) refers to this conflation as the "epistemic fallacy". Bhaskar argues that knowledge is a social product:

> Against this it is argued that knowledge is a social product, produced by means of antecedent social products; but that the objects of which, in the social activity of science, knowledge comes to be produced, exist and act quite independently of men (2008: 5-6).

Stratification, as shown in the levels of Bhaskar's ontology is a common theme in critical realism, and refers also to inquiry (Bhaskar, 1978: 154-175), which may start at surface level with rule-of-thumb or formulaic expressions, moving to in-depth explanations involving complex theories (e.g. laws of physics). It must be emphasized that Bhaskar's ontology, while realist, does not depict reality as static and fixed, but dynamic, and in a state of flux, where new developments are ever emergent (Bhaskar, R., 1979: 106-117). According to Sayer, emergence in the social world is relative to the roles and identities of people as well as the accompanying powers attached to their positions, relations and contexts. According to Sayer, the contexts in social systems are derived from our interpretation of the situations rather than from being passively shaped by our contexts (Sayer, 2000: 13).

3.6 The concept of social structure

Before proceeding to Archer's morphogenetic approach, it is necessary to clarify the issue of what Bhaskar meant by the term "social structure", as Archer premises her substantive theory of morphogenesis on Bhaskar's over-arching meta-theory. Archer often uses terms with specific definitions, and these need to be unpacked; for example, the term "agent" is plural and is used with a particular force (i.e. a collective social group). In the *Postscript* to *The Possibility of Naturalism*, Bhaskar himself admits that he used the term ambiguously in the sense that it could mean both form or material object (e.g. a building can *have* a structure or *be* a structure), and also that he used the term synonymously with that of generative mechanism (Bhaskar, R, 1979: 187), the definitions of which, in retrospect, he preferred to separate (social structure being one example of a generative mechanism). According to Porpora: "Social structure is one of the most central concepts in sociology". Yet there is wide disagreement about what it means" (Porpora, 1998: 339). While many accounts refer to social structures as being the material objects (including

human) involved in certain social contexts, it is clear that by social structure Bhaskar meant “a nexus of connections” among humans (and material objects) “causally affecting their actions and in turn causally affected by them” (Porpora., 1998: 343). It must be emphasised that the causal connection, as reflected in Archer’s morphogenetic cycle, is complex. As Porpora says:

> The causal effects of the structure on individuals are manifested in certain structured interests, resources, powers, constraints and predicaments that are built into each position by the web of relationships. These comprise the material circumstances in which people must act and which motivate them to act in certain ways. As they do so, they alter the relationships that bind them in both intended and unintended ways (1998: 344).

Because they are altered over time by human activities, social structures are not only the *context for* but also the *product of* human interaction (Lewis, 2000: 251). However, social structures are not amenable to change by the attempts of individuals, and tend to change relatively slowly over time (Archer, 1998b: 376). While social structures are set in place by human activities, it must be remembered that social structures pre-empt our entry into them; individuals are born into the context provided by social structures which are already there, formed by “the activities of the long dead” (Archer, 1998b: 363). While social structures tend to resist individual attempts at change, the positions and practices within them may in fact change rapidly depending on contingent factors, including features of the historical period. This is why “historicity” (Archer, 1998b: 373) is important, in terms of identifying contingent factors which might accelerate or slow down changes.

Archer emphasises the importance of distinguishing between social structures and people and of analysing them separately to reveal the causes of social conditions, which she terms “analytic dualism” (1995: 165-194). As Bhaskar explains, “society does not consist of individuals [or, we might add, groups], but expresses the sum of the *relations* within which individuals [and groups] stand (Bhaskar, 1998c: 28, my emphasis). He adds:

> Society is both the ever-present condition (material cause) and the continually reproduced outcome of human agency. And praxis is both

> work, that is, conscious production, and (normally unconscious) reproduction of the conditions of production, that is society (1998c: 39).

But Bhaskar also cautions us that "people do not create society":

> For it [society] always pre-exists them and is a necessary condition for their activity. Rather, society must be regarded as an ensemble of *structures, practices and conventions* which individuals reproduce or transform, but which would not exist unless they did so (1998c: 39, my emphasis).

He clarifies this as follows:

> …it is no longer true to say that human *agents* create it [society]. Rather we must say; they *reproduce* or *transform* it. That is to say, if society is already made, then any concrete human praxis … can only modify it: and the totality of such acts *sustain or change* it"(Bhaskar, 1998c: 36)

Social structures, being complex sets of relationships, are visible or made manifest only in the social interactions of people (whether this be in the role of agents, actors or persons). A "person" is one who has no specific role or powerful agency but may also be influenced by the direct or indirect effects of social structures. An "actor" is a person who plays a social role, which is offered by a social structure. By "agent", Archer means a plural group of significant players who are in a position to influence social change (although the proposed changes - or retention of the status quo - may be contested by other powerful groups). However, the above section should show that it is incorrect to say that human agency *creates* social structure: the system of relationships comprising social structure which exists because of the actions of past participants is manifested in the interactions of those present, which are either reproducing or transforming the system for *future* participants.

Social structures are in fact generative mechanisms with causal power: "social forms are a necessary condition for any intentional act … their pre-existence establishes their autonomy as possible objects of scientific investigation and … their causal power establishes their reality" (Bhaskar, 1998b: 206). According to Bhaskar, the mediating system between social structures and human agency

consist of “the *positions* (places, functions, rules, tasks, duties, rights, etc.) occupied (filled, assumed, enacted, etc.) by individuals, and of the *practices* (activities, etc.) in which, in virtue of their occupancy of these positions (and vice versa), they engage” (1998b: 221).

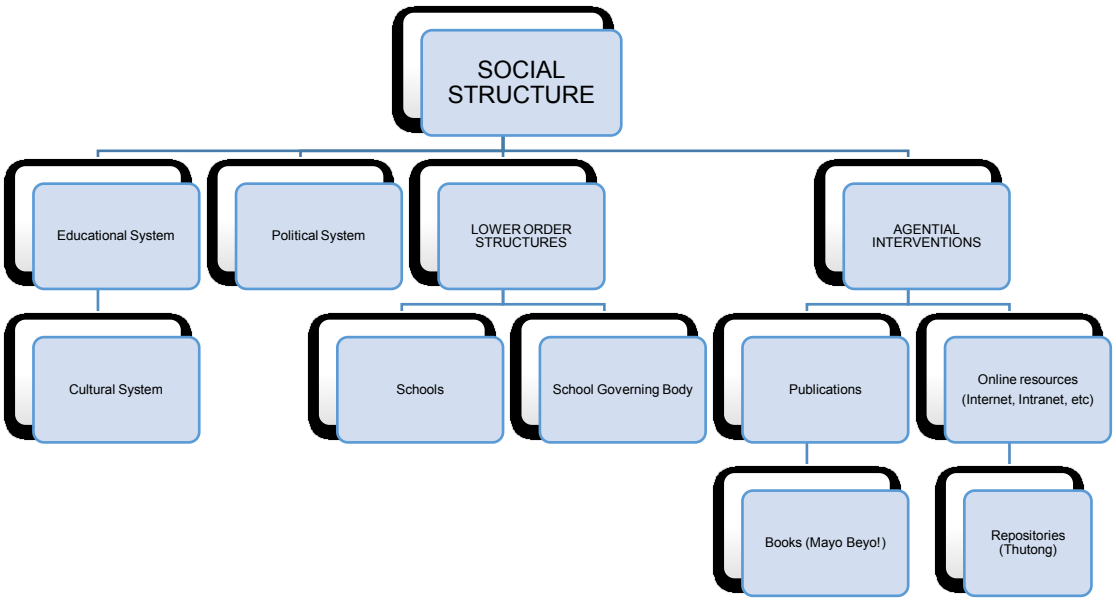


Figure 3.1 Related elements in the social structure contextualising education in KwaZulu-Natal

Elements of the social structure contextualising education in KwaZulu-Natal are suggested in Figure 3.1, which does not, however, claim to be exhaustive or to represent all of the intricate relationships between the various elements. The social structure of education in KwaZulu-Natal comprises the complex web of interrelationships (with webs of substructures) between various agents (and actors), entities and material objects, including, inter alia:

- Policies
- Government departments
- Legislature

- Budgets
- Resources, including:
    - schools
    - staff [teachers, administrators]
    - infrastructure (classrooms, desks, blackboards, whiteboards, computers)
    - community members

Since political liberation there have been frequent attempts by agents (Jansen, J, 2013: 36) to overhaul, tweak, change and/or somehow adapt or improve the educational system so as to provide quality education for all children in South Africa, in particular in economically disadvantaged provinces such as KwaZulu-Natal. Apart from the fact that social structures (i.e. such as those underpinning educational service delivery) resist individual attempts at change, research has suggested that the causes of the problems have not been sufficiently investigated (Govender, 2011).

3.7 Archer's morphogenetic approach

Although it has been termed the "morphogenetic approach" (Archer, 1995) Archer's concept of morphogenesis/morphostasis is rather a "substantive theory" (Mutch, 2010: 507) operating at a lower level within Bhaskar's philosophy, with specific reference to social development and change. In this sense, Archer is following Bhaskar's suggestion that researchers within various fields or areas must develop their own discipline-specific theories and methods while working within the critical realist meta-theory. Archer's morphogenetic approach (1995) deals with the interplay of structure and agency (see Wong, 2005: 13) in bringing about replication (morphostasis) or change (morphogenesis) in social structure. In Archer's morphogenetic cycle (1995), "time" is viewed as a significant factor in terms of explaining morphogenesis/stasis:

> This represents the bedrock of an understanding of systemic properties, of *structuring over time*, which enables explanations of

specific forms of structural elaboration to be advanced (Archer, 1982: 468 my emphasis).

Time is an important aspect in the morphogenetic cycle as social structures are set in place by *past* agents and their emergent properties are expressed only in the *present* and *future* (see Archer, 1998b: 370).

Archer uses the graph shown in Figure 3.2 to give an illustration of the projected exponential growth of literacy in Cuba based on initial distribution of resources (in this case, skills), pointing out that "only some kinds of properties would approximate to this exponential pattern of change", namely, "skills, knowledge, capital accumulation, demographic distribution" (1982: 468-469). As well as explaining past trends and tendencies by viewing how these emerge over time, according to Archer: "Logically it follows that we can also theorize about the on-going emergence of more complex things provided we see these as spaced out over time"(1998b: 368).

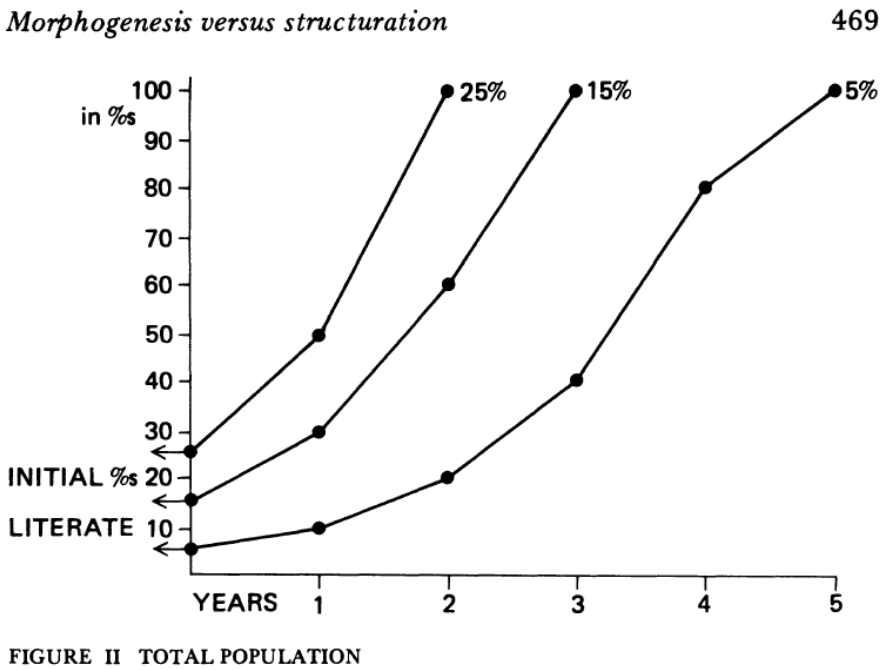


Figure 3.2 Time and the morphogenetic sequence: Castro's example (in Archer, 1982: 469; 1995: 77)

In terms of “structuring over time” it must be stressed that this research takes place within a much wider temporal era involving the impact of the advent of computers and the Internet on social structures, and that the researcher, while acting as an individual, is part of a larger more powerful agency involved in making resources available to the general public. The proposed transformation (i.e. of English teaching/learning in KwaZulu-Natal) by use of a LLOR is taking place in the context of a wider wave of IS transformation, which means there is more likelihood that even a brief intervention might change attitudes, and hence, practices over time.

3.7.1 Morphogenesis as explaining social change/reproduction

The approach used in this study fits the philosophical orientation, critical realism, as Archer’s morphogenetic cycle (1995) is based on Bhaskar’s philosophy, in an attempt to explain the operation of Bhaskar’s transformational model of social activity (Figure 3.3) in more detail (Bhaskar, 1994:92 in Judd, 2003: 49). In particular Archer focused on the role of human agency in bringing about change, as the role and nature of human agency has proved problematic in critical realism (Hodgson, 2003). Archer’s work has thus focused on the operation of human agency, showing how it can be accommodated within the realist framework, as, she claims, human agents have: “the properties and power to monitor their own life, to mediate structural and cultural properties of society, and thus to contribute to social reproduction or transformation” (2002: 19).

As Pratt states, explaining Bhaskar’s transformational model of social activity:

> Human agency is both enabled and limited by the opportunities and constraints afforded by social structures, at the same time maintaining the fabric of these structures, which are fairly stable, but capable of gradual change, usually by one or more of the complex social mechanisms which maintain these structures rather than as the result of individual human agency (or specific interest groups) per se (2007b: 42).

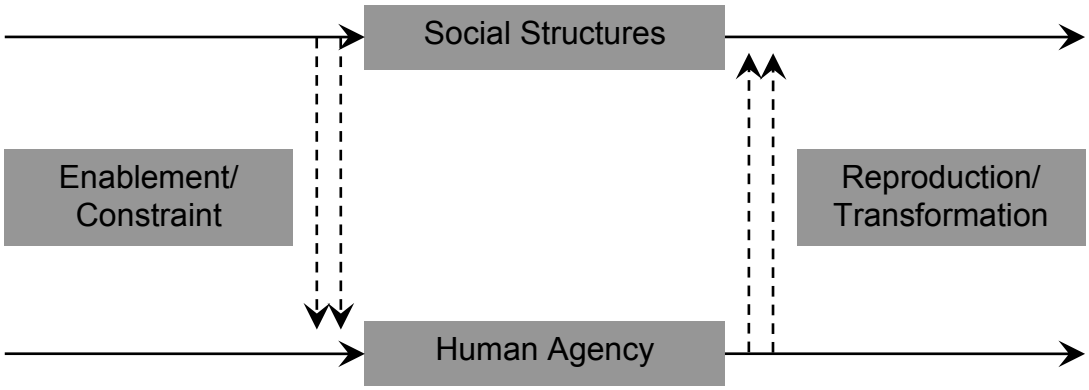


Figure 3.3 Bhaskar's transformational model of social activity (Bhaskar 1994:92 in Judd, 2003: 49)

3.7.2 Archer's morphogenetic/static cycle

While social structures might be maintained by mechanisms other than individual human agency, social change or stasis is brought about by human agency in socio-cultural interactions, according to Archer, as is described in her basic morphogenetic/static cycle (see Figure 3.4).

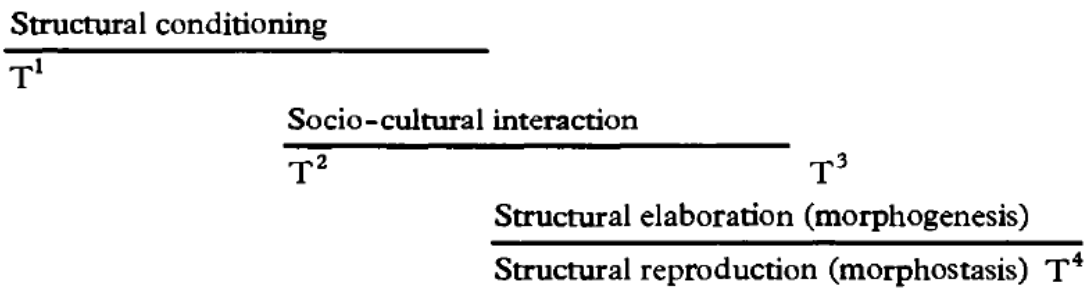


Figure 3.4 The basic morphogenetic/static cycle with its three phases (Figure 6 in Archer, 1995: 157).

According to Archer:

> [Thus] every morphogenetic cycle distinguishes three broad analytical phases consisting of (a) a given structure (a complex set of relations between parts), which conditions but does *not* determine (b), social interaction. Here, (b) also arises in part from action orientations unconditioned by social organization but emanating from current agents, and in turn leads to (c), structural elaboration or modification - that is, to a change in the relations between parts where morphogenesis rather than morphostasis ensued (1995: 91).

She reminds us, however, that "structural conditioning is not the sole determinant of interaction patterns" (1995: 91).

Archer uses the term "morphogenesis" to describe the process of social structuring, as society is an open system: "is open because it is peopled, and being peopled can always be re-shaped through human innovativeness":

> Hence the term 'morphogenesis' to describe the process of social structuring; 'morpho' indicating shape, and 'genesis' signalling that shaping the product of social relations. Thus Morphogenesis' refers to those processes which tend to elaborate or change a system's given form, state or structure. Conversely, 'morphostasis' refers to those processes in complex system-environmental exchanges which tend to preserve or maintain a system's given form, organisation or state(1995: 166).

According to Archer, morphostasis (or social reproduction) occurs when structural characteristics are such as to produce a culture that is predisposed to favour maintaining the status quo; this culture in turn supports structural characteristics which support such thinking. This results in the "closed loop" configuration shown in Figure 3.5. On the other hand, cultural conditioning may be such as to promote structural elaboration (i.e. change), as shown in Figure 3.6, where the transformed structure in turn feeds back into the cultural. Morphogenetic cycles would bring about changes in social structures, while morphostasis would either maintain the status quo or sustain the change/s taking place.

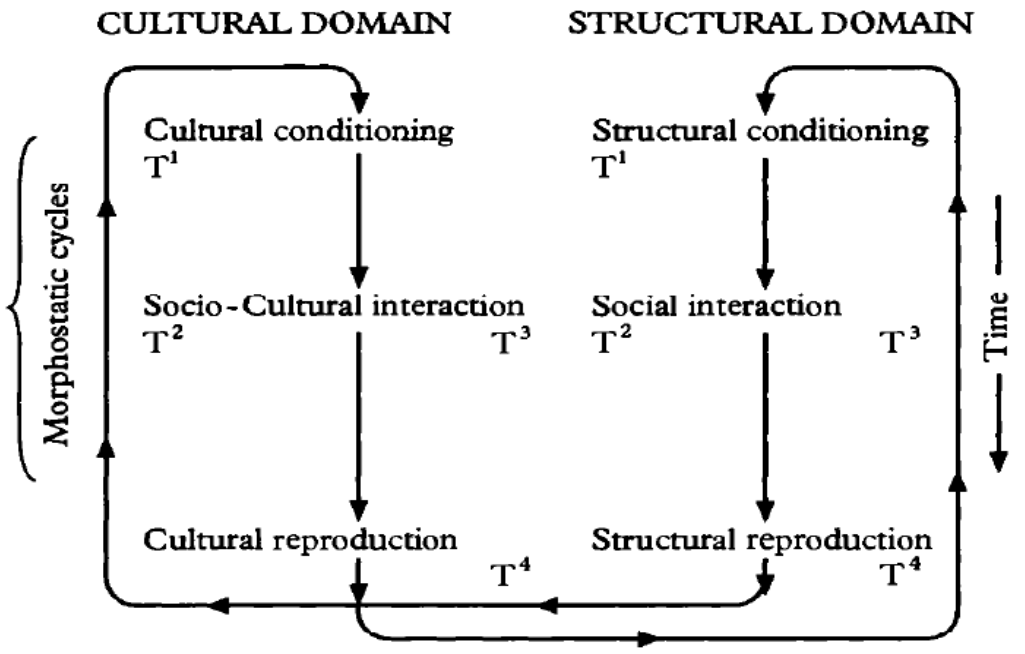


Figure 3.5 Structural and cultural configurations reproducing morphostatic cycles in society (Figure 19 in Archer, 1995: 309).

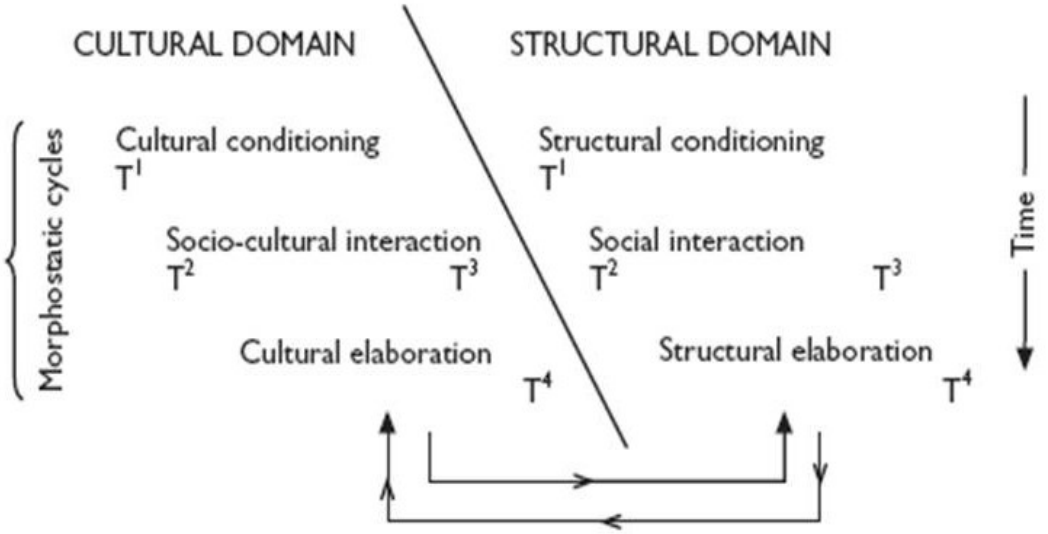


Figure 3.6 Structural and cultural configurations generating morphogenetic cycles in society (Figure 2 in Archer, 1995: 323).

It must be emphasised that neither morphogenesis nor morphostasis is "good" or "bad" per se, but part of regular cycles in social structure, and that morphostasis does not necessarily imply "stagnation" but may represent consolidation or maintenance of an effective system.

Archer has been criticised by Bates (2006) for describing rather than explaining the morphogenetic and morphostatic cycles:

> … by employing morphogenesis and morphostasis, Archer is unable to provide concepts with which to explain change. Rather, they merely describe change by allowing the comparison of different historical periods (2006: 147).

He also accuses her of "ontological dualism": "The dualism inherent within Archer's opposing conceptualizations [of time, i.e. as cyclical or linear] prevents a fluid description or explanation of change being developed (2006: 149). However, Bates appears to reify social structure (which he never defines, and its system of relationships only) and can offer an "analogy" only to deal with the structure/agency relationship (2006: 156) rather than Archer's analytical dualism.

But as Archer herself points out, the key question is: "when are we going to get transformation rather than reproduction, or vice versa?'" (Archer, 1998b: 360). This type of explanation needs to occur at lower levels (see Figures 3.7 and 3.8) than can be accommodated in the previous diagrams. Archer suggests that the presence - or lack of - both systemic and social integration are key issues in determining whether morphogenesis or morphostasis takes place (Figure 3.7). The two axes represent social integration (i.e. how well various groups integrate) and systemic integration (e.g. how well elements of the system relate and thus provide a satisfactory context for human interaction). Figure 3.7 shows that the "opportunism" sector provides the best-case scenario offering opportunities for social innovation (including those involving technological innovation): this is where both social and systemic integration are low, and contingent "complementarity" offers a window for innovation.

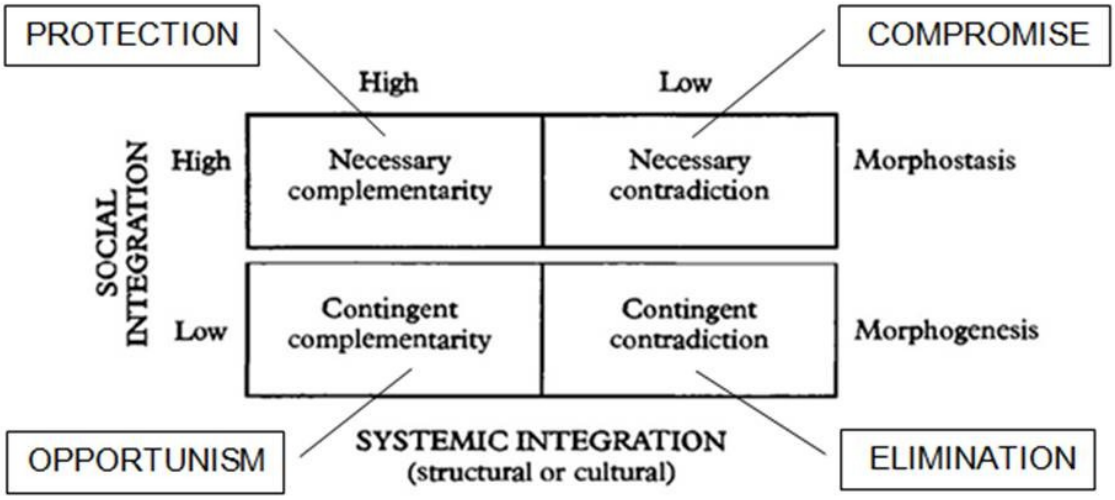


Figure 3.7 When morphostasis rather than morphogenesis occurs (Figure 17 in Archer, 1995: 295, slightly adapted).

Bhaskar, in explaining the relations in social structures, states:

> This relational conception of structures, explicitly incorporating time past as well as time present, then allows one to focus on the distribution of the structural conditions of action, and in particular…differential allocations of: (a) productive *resources* (of all kinds, including for example cognitive ones) to persons (and groups) and (b) *persons (and groups)* to functions and roles (for example in the division of labour). In doing so, it allows one to situate the possibility of different (and antagonistic) interests, of conflict within society, and hence of interest-motivated transformation in society structure(1989: 41, my emphasis).

Archer emphasises the fact that "the distributions, roles and associated interests with which they live" are not the result of the action of those in the present, and that "the *prestructuring* of actors' contexts and interests is what shapes the pressures for transformation by some and for stable reproduction by others, in the present" (Archer, 1998b: 371, my emphasis). This gives credence to her contention that "analytic dualism" is required to explain morphogenesis/ stasis, as different time frames are involved in setting up the structure and the current actors' activities; any current agency needs to be studied separately

from the structure which was set in place by past agency. According to Archer, morphogenesis or morphostasis are not accidental or inevitable:

> Reproduction is anchored in vested interest and not mere routinization, and transformation is not an undifferentiated potential of every moment, it is rooted in determinate *conflicts* between identifiable groups who find themselves in particular positions with particular interests to advance or defend (1998b: 371, my emphasis).

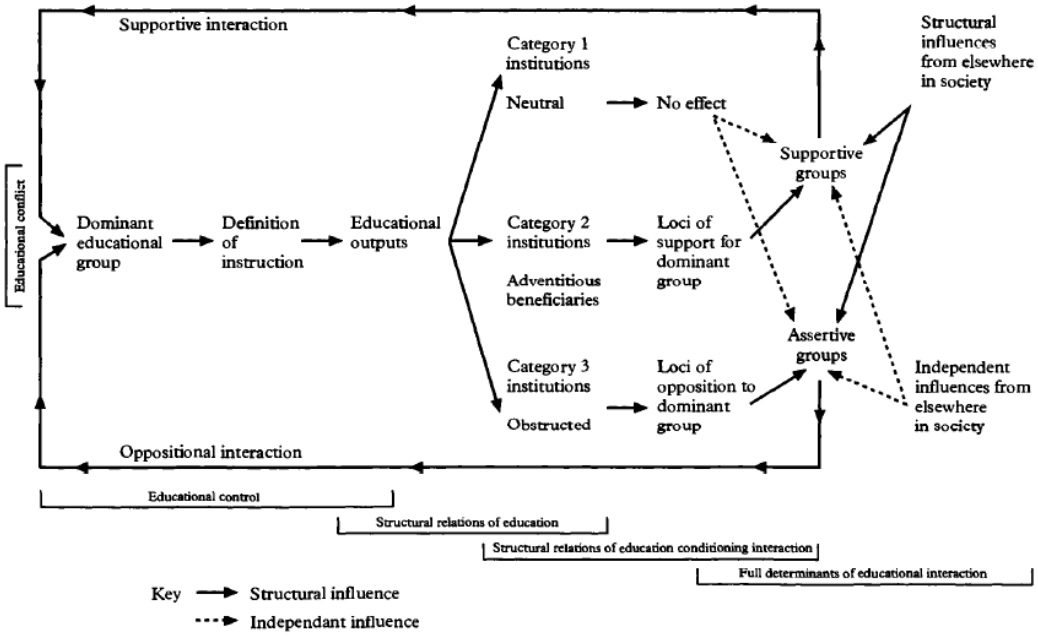


Figure 3.8 Structural conditioning of educational interaction (Figure 21 in Archer, 1995: 342).

This is illustrated in Figure 3.8, in which Archer has analysed morphogenesis, where competing/supporting groups are shown as shaping educational structure in England in the last 1800s early 1900s (1995: 342).

Wikgren (2005) comments that, although it has been subjected to severe criticism, Archer's realist social theory could be used as a suitable framework for the examination of the use of information in organisations: "In these studies there is expressed the need of a greater awareness of structure and process,

and of the human being acting as a person, a collective agent, and as a social actor"(2005: 13).

3.8 The role of technology in social structure

To recap on the above sections, social structure is a network of relationships linking people and material objects to form both the context and product of human interactions. As Mutch (2010: 510)points out, Archer does not deal with the role of technology in social structure, or "the use or impact of forms of technology". Yet, according to Lawson, technology significantly affects our very mode of existence:

> This sense in which technical objects are social is worthy of note. To say that values, intentions and even social relations become concretized in this way is to talk of essentially social things becoming material. As such, given the relative concept-space-time independence of material things, there is a relative endurability and travel that is possible for those otherwise precarious aspects of the social world. Thus, and this seems to be centrally important for an understanding of the nature of technology, technology is the site in which the social *achieves a different mode of existence through its embodiment in material things* (2009: 42).

Lawson (2010: 9) suggests that "technical activity is best conceptualised as activity undertaken to harness the intrinsic powers of material artefacts in order to extend human capabilities". The relationship between society and technology is complex, however, and not just an issue of controlling the environment, or constraining or enabling particular human behaviour. Lawson identifies two ways in which technical objects can be viewed as social (2010: 6):

> First, they are social in that the form they take is effectively a concretization of past values, actions, social relations, etc. Thus to understand why they take the form they do, requires a consideration of human actions of various kinds. The second sense in which artefacts are to be understood as social is the relational sense.

In the first sense described by Lawson, technical objects are imprinted with human values, desires and intentions (2008: 5). The social, then, becomes "embodied" in material things, which means that previously ephemeral aspects of social life are more permanent and can be transported to different contexts

(e.g. wedding photographs captured on Facebook and thus being immediately accessible to relatives on another continent). Lawson notes that technical objects also leave an imprint on humans in shaping the competences of those engaged with technology (2008: 4).

In the second sense (i.e. relational), technical objects become embedded in the technical and social networks, which "reproduces or transforms a variety of social relations along the way" (e.g. Supervising master's students online, which may either involve replication of traditional supervision practices or transform these). Lawson (2008: 5) points out that technical and social networks share a "duality of practice" in the sense that not only does technical action (like social action) result in "unintended consequences", but also "action to do one kind of thing (technical) achieves another kind of thing (social)".

That the social *achieves a different mode of existence* (2010: 214) is further emphasised by Aunger (2010), who goes one step further than Lawson in showing that human society is so immersed in technology from an evolutionary point of view that society as we know it would not exist without the technology developed through the ages: not only has it augmented our human capacity but *we have become who we are as a society because of technology*. Technology, then, truly has emergent powers in its role in shaping society and social relations, and is not just a convenient "add-on".

As Lawson states:

> The point … is that technical activity, as noted above, harnesses the intrinsic causal powers of material objects for the purpose not of aesthetics, or consumption (directly) but to extend human capabilities. The use of the word extension here is intended to capture various features of the process involved. It is not simply that new possibilities are atomistically 'added on'. *What is involved in being human may substantially change in the process of technical activity* (2010: 9).

Not only do we change in the sense of gaining new competences, but "in accommodating new technologies into our everyday ways of doing things our

sense of our own place in our world changes" (Lawson 2010: 9). To sum up: "Extension of human capabilities transforms what it is to be human" (2010: 9). Thus, as a parallel to Archer's transformation model of social activity (TMSA), Lawson (2007: 4) posits a "Transformational model of *technical* activity (or TMTA)", in which technology transforms not only technical but also social practice.

3.9 The role of ICT in social structure

According to Mutch, "A morphogenetic approach enables us to take account of the different modes of agential reflexivity and how these might be impacted by technology" (2010: 508). Mutch (2010: 507) defines information and communication technology (ICT) as "technologies for the processing, storage, and transmission of digital material, consisting of ensembles of hardware and software with distinctive feature sets allowing for the physical storage and logical representation of different forms of data." However, while the information and communication aspect clearly involves "meaning creation", Mutch emphasises that, for the purposes of analysis, the communicative aspect of technology in ICT needs to be separated from its technical aspect.

The growing interest in Archer's morphogenetic theory shown by IS and ICT researchers can be attributed in some part to the realisation that computers and computer systems do not just have a material reality but are designed and produced for use in social contexts, and that our relationships with them therefore form part of the complex network of relationships which comprise our social structure. Thus, while artefacts such as computers have a material reality, they are conceptualised in different ways by users, and are put to use in social interactions: the network of linkages connecting people to artefacts involves these different aspects. As Fleetwood points out, "Computers are a synthesis of the physically, ideally and socially real" (2005: 3). It is the various aspects of the "artefactually real" nature of computers and the internet, which includes their material, ideal and social aspects, which must be taken into consideration in the design and operation of IS and ICT systems (Pratt 2013b). There is also a case for viewing the Internet and online courses/repositories as social structures in themselves, as they are mechanisms which act as both the

context of and motivation for social interactions, as well as being the product of these interactions. However, the Internet should rather be seen as a techno-system (Aunger, 2010) acting as the mechanism setting in place the social structure of the World Wide Web (Pratt, 2013a).

3.10 Conclusion

The LLOR developed in this project is, then, an artefact designed "to harness the intrinsic powers of material artefacts in order to extend human capabilities" Lawson (2010: 09). Thus exemplary models of language learning methods as well as language resources are made available to educators and learners who would otherwise not have access to them, and their competences are "extended" by recourse to virtual learning. The LLOR is "imprinted with human values, desires and intentions" (2007: 05) in terms of being designed for specific language learning needs (ESL) in a specific context (KwaZulu-Natal) and also in terms of user input into a "shell" system which allows users to customise it to their own needs and preferences. In Lawson's words, language teaching and learning achieve "*a different mode of existence*" in the LLOR though their "*embodiment in material things"* (2007: 42). It is hoped that the LLOR will also "leave an imprint on humans in shaping the competences" of educators and learners engaged with it (2007: 04).

Bhaskar (1998b) emphasises that it is the roles people play, and not specific individuals, which are interlinked in social structures; following Bhaskar, Pratt (2013) suggests that it is the role played by the artefact, rather than specific artefacts, which become part of social structures. In this study LLORS are being modelled in terms of the role they play as part of the social structure of teaching/learning. Aunger's point that we are immersed in technology with many levels of development coming together at a given point in time suggests that it is very likely that such models will be adopted.

Chapter 4: Methodology

4.1 Introduction

Chapter 4 first discusses the application of the morphogenetic approach as applied to artefact development, with reference to previous ICT artefact designs adopting Archer's theory, and showing in what respects it differs from the traditional action research cycle. Next, an overview will be given of the design and piloting of the LLOR, showing how this is linked to cumulative technological developments as well as anticipated corresponding changes in social structure. The phases involved in the larger morphogenetic cycle contextualising this study are then described, as well as the phases (and sub phases) involved in the actual methodology used. As well as distinct phases, there are also different levels involved in the methodology, which are identified as relating to technical, systemic and deeper theoretical levels. The methods used for artefact testing are then described, and the chapter concludes by showing how artefact design and artefact testing will be dealt with in subsequent chapters

4.2 The morphogenetic approach as applied to artefact development

While Archer has not dealt with how relationships with technology as included in the network of social structure may transform (or inhibit) social change (Mutch, 2010), both Wong (2005) and Hill (2009) have applied Archer's morphogenetic approach to innovation development in terms of developing electronic systems or artefacts. Wong (2005: 5), applying Archer's morphogenetic approach to artefact development, states:

> The morphogenetic approach … allows for the modeling of innovation development as sociocultural cycles involving the interaction between structural, cultural and agential forces over time. In investigating the dynamics of this process, the researcher needs to establish the systemic conditions pre-existing the change, the situational logics arising from the specific configuration of structural and cultural conditions, the social interactions among actors, and the ways in which the outcome reflects the

transformation or reproduction of structural, cultural and agential conditions" (Wong, 2005: 5).

In other words, artefact design is not so much about developing cutting-edge technology, but fitting the innovation to the social context in which it is to operate and the conditions prevailing at the time of its introduction into a social setting.

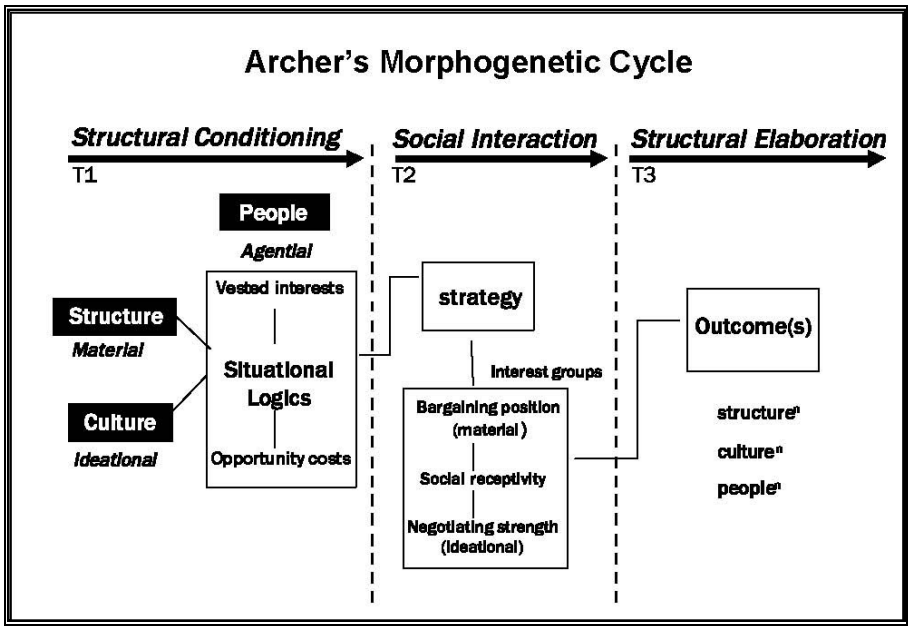


Figure 4.1 Archer's Morphogenetic Cycle as depicted by Wong for innovation development (Wong, 2005: 13).

Some of the key factors mentioned by Wong are shown in Figure 4.1. The "systemic conditions pre-existing the change" were explored in the literature review; the review also shows that the "situational logics" (see Structural Conditioning in Figure 3.8) up until the present have been seen in terms of an underlying deficit model which reflects at surface level a lack of trained teachers and appropriate hard print resources, as well as the funding needed to remedy this deficit. The literature review also paints a picture of social and cultural dysfunction in terms of vast cultural differences and vested interest groups (such as teacher Unions, see Govender, 2011) as well as lack of trust in effective Government interventions, that is, a failure in educational leadership

(Govender, 2011). The current conditions are in fact conducive to innovation and change (see Figure 3.7) where low social and systemic integration create conditions promoting morphogenesis and allowing “opportunism” in a good sense, in terms of the opportunity to introduce innovation.

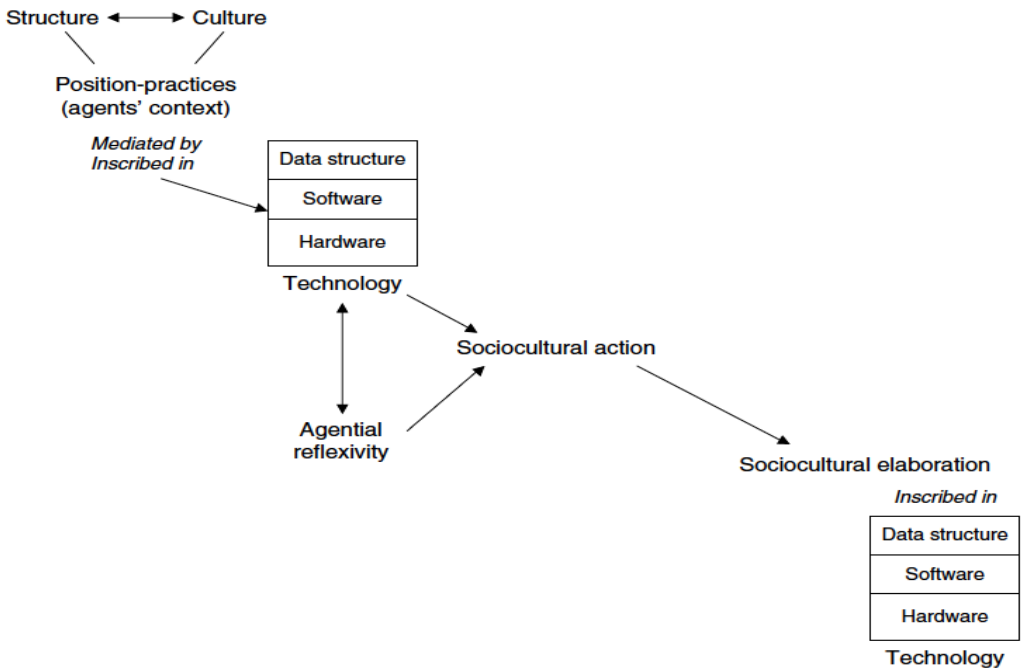


Figure 4.2 A morphogenetic approach to technology and organizational action (Mutch, 2010: 511)

According to Mutch (2010: 517) “Archer’s morphogenetic approach is, in turn, developed at the level of social theory, in which both organizations and technology play minor parts” (see Figure 4.2). He goes on to stress that in the context of a relational approach the importance of “the notion of antecedent conditions”, should prevail (Mutch, 2010: 517).

A summary of Mutch’s approach is given below:

- Structures emerge over time from human activity, but once in place form objective contexts for the exercise of agency. Technology renders some of these more durable in both time and space.

- Technology has particular material properties best conceptualized as composed of particular combinations of levels and features. The existence of data structures is particularly important in embedding particular forms of position-practices.
- Arguing that technology has particular material properties does not mean that agents will not have particular conceptions of such properties and their implications. What it means is that we need to explore the interplay between material properties and agents' conceptions.
- Agents' conceptions are shaped not only by their engagement with technology, but also by the broader situational logics supplied by cultural schema. There is a relationship of relative autonomy between such bodies of ideas and institutional arrangements (Mutch, 2010: 511).

In the context of this research, while technological advances have accelerated exponentially in the past few years, it must be remembered that society is "layered" (or stratified) in it use of cutting-edge technology in progressive generational terms (e.g. "Generation X", the "Millennium Generation"). For example, Educational Technologists at DUT might be exploring tablets and mobile learning, but teachers (except for the very young) tend to be more comfortable with computers and the Internet, while their students are born into the tablet generation. Society tends to be stratified in terms of the "typewriter generation" using mobile phones with keyboards (e.g. Blackberry) and later generations being more comfortable with touch screens. It is misleading to view society as automatically moving on to adopt the latest technological innovations overnight: we have a layered society in terms of actual *use* of technological artefacts, as in people's preferred use of tablets or mobiles. In the course of artefact development, then, the researcher not only has to use develop an application using the most appropriate (for purpose) platform but also consider the stratified layers of end users.

Artefacts have "emergent" properties as they are refined, used and re-used, both replenished of new and pruned of obsolete elements, and developing with time, even within that involved in the relatively short time frame of development

in this study. The digital aspect of the LLOR as resource means that changes can be implemented speedily to adapt it to the dynamic social reality of the educational system, as well as adapting to the layered preferences of its users.

4.3 Design and piloting of the LLOR

The intention of designing and piloting the CALL was to assist with the transformation of language teaching/learning by providing renewable digital resources to enhance and augment learning resources: namely teaching skills and learning materials. In morphogenetic terms, this has the intended effect of making teaching/learning resources more evenly distributed amongst various groups, in particular, giving teachers and learners access to resources they would otherwise not have. Social inclusion (Warschauer, 2003: 7) is a key facility offered by the advent computers and the Internet. The level of ubiquity reached amongst users (no matter what device used) at this stage makes time and cost-effective provision of digital resources a reality, even in disadvantaged communities, because of access to mobile devices such as mobile phones.

To put this in perspective, this is an intervention in the transformation of social structure already set in train by the change in material aspects of reality introduced into social functioning by ICT, and thus gradually changing the system of relations comprising social structure. While past inventions /innovations set the scene for the change, technological development have reached the stage where there is an exponential increase in the availability of Internet resources (see Figure 4.3), which has a potentially transformational effect on the social structure involved in teaching/learning. However, the phenomenon of information overload makes it essential to manage resources so that the cost (i.e. in time) of making these available does not become too high for educators and learners. In a sense, the curator function becomes that of a text-book editor in ensuring that suitable materials are easily made available to specific groups; or of a school librarian in collating subject-specific materials in a similar way.

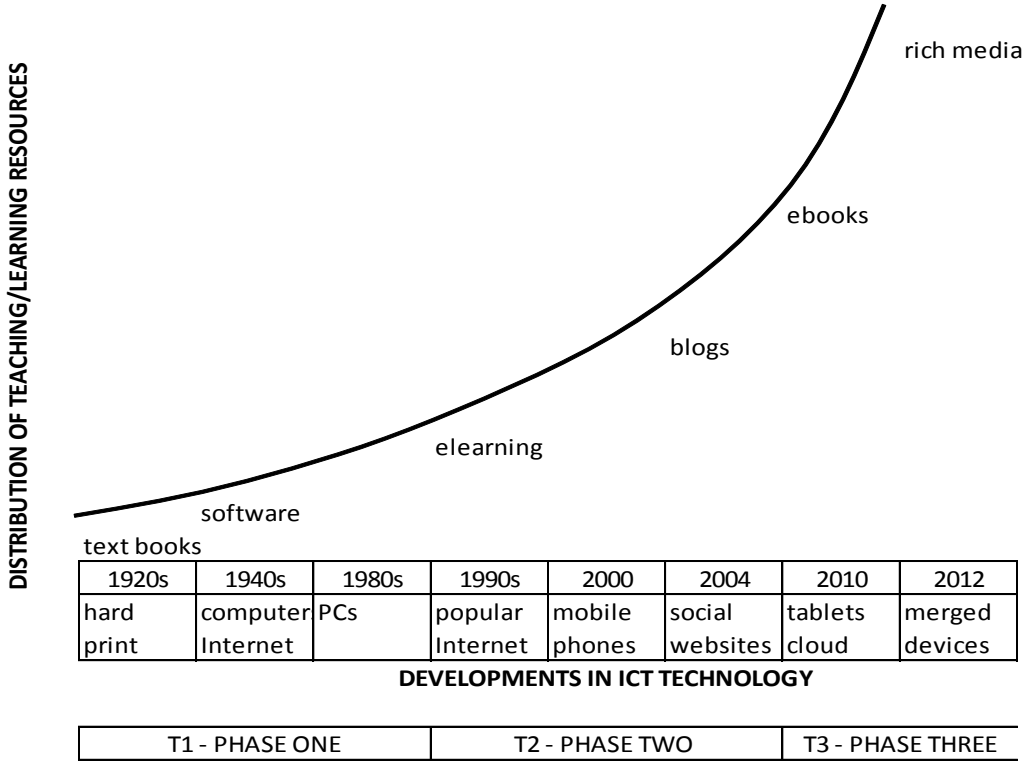


Figure 4.3 Exponential increase in availability of Internet resources

Thus, the LLOR does not claim to transform education overnight (as teaching/learning is a social structure, and is already being maintained/transformed by the activities of participants in the past); it is about adding digital resources (skills and materials) to add to the cumulative effect of long term transformation by mean of digital resources initiated by the advent of computers and the Internet, as shown in Figure 4.3. The availability of resources can already be shown to have reached proportions where people are being flooded with rich data, much of which can be used for literacy/language teaching/learning (Pratt, 2009).

Internet resource provider*s* have been - and are - transforming education gradually since the introduction of the Internet, so that the LLOR is part of this overall wave of transformation. It is in the area of *resources*,[3] teaching skills or learning materials where the LLOR intervenes: the eventual morphogenesis is

[3] Training sessions are essential for teachers to become proficient in various aspects of using the resources in the LLOR.

anticipated as being in the area of culture, rather than structure. Cultural attitudes will adapt so that more teachers and students will see digital resources as a "natural" option of the educational social structure. Situational logics will change to see the digital solution as just as "obvious", "natural" or "correct" as the traditional solutions.

4.4 Phases involved in the morphogenetic cycle

The phases involved in the morphogenetic cycle are similar to those of the action research cycle, except that the morphogenetic approach is more concerned with analysing phases in an historical context in order to come up with practical solutions (i.e. praxis informed by theory) than iterative experimentation and reflection on action. Action research is a typical method for developing more effective educational interventions in general, based on the work of McNiff, Zuber-Skerrit and Wenger. As McNiff states:

> Action research is becoming increasingly known as an approach that encourages practitioners to be in control of their own lives and contexts. It began in the USA, came to prominence in the UK in the 1970s, and by the 1980s it was making a significant impact in many professional contexts, particularly in teacher professional education. Now its influence is world wide, and has spread to virtually all areas where personal and professional learning is undertaken (McNiff & Whitehead, 2005: iv).

However, as the orientation adopted was critical realist, and the application was designed for use in a social setting, the author used Archer's morphogenetic cycle (1995). This meant that the phases involved a temporal scope wider than the actual artefact development, as shown in Table 4.1. Thus the research cycle adopted here is more in the nature of layers than repetitions, constituting a form of stratification in the methodology. Artefact development does not start in an instant of time: it has a past history of development in the social conditions leading up to it, as well as the artefact developer's acquisition of knowledge, skills and experience.

Table 4.1 Phases involved in the morphogenetic cycle

PHASE I	**PRE-EXISTING SOCIAL CONDITIONS**
	Apartheid education policies led to a literacy crisis in KwaZulu-Natal with limited language learning resources and under-prepared teachers.
PHASE II	**IMPACT OF TECHNOLOGY ON SOCIAL STRUCTURE**
	Rapidly changing advances in digital technology made cheap and easy access to rich media resources possible via computer and/or mobile technology.
PHASE III	**ARTEFACT DEVELOPER'S BACKGROUND**
	The researcher's background in Educational Technology and LIS gave him the specific ICT "savvy" and skills for effective artefact development.
PHASE IV	**ARTEFACT DEVELOPMENT**
	An artefact (LLOR) was developed using technology to solve specific language learning problems capable of being solved by technology.
PHASE V	**END USER FEEDBACK**
	Various role-players in the KwaZulu-Natal Education landscape were selected to give end-user feedback on the artefact in terms of its ease *of* use and potential *for* use.
PHASE VI	**FUTURE USE AND DEVELOPMENT**
	The next cycle will involve actual use of the artefact in specific educational contexts in order to assess the artefact and make any necessary modifications.

Phase I represents pre-existing social conditions, namely, the apartheid education policies which led to a literacy crisis in KwaZulu-Natal with limited language learning resources and under-prepared teachers (Govender, 2011). These pre-existing conditions were established in the literature review, referring to recent studies investigating language learning and literacy development. Phase II refers to the recent impact of technology on social structure, with the rapidly changing advances in digital technology making possible economical and easy access to the rich media available on the Internet by means of computer and/or mobile technology. The relationship between technology and social structure was explored in this chapter, suggesting the potential of ICT as a resource for language teaching and learning. Phase III relates to the artefact developer's background in educational technology and Library and Information Studies which gave him the specific ICT know-how and skills for effective artefact development. These competences will be referred to (where

applicable) in the course of the artefact development. Phase IV deals with the actual development of the artefact, which is covered in the next chapter. Phase V, end user feedback, is dealt with in the chapter after that. The next phase, Phase VI, which is not dealt with in this dissertation, except in terms of possible recommendations for use, will involve actual use of the artefact in specific educational contexts in order to assess the operation of the artefact and make any necessary modifications. IV and V themselves involved sub-phases, as described further below.

4.5 Phases involved in the methodology

The phases involved in the methodology (i.e. the sub phases of IV and V) are linked to the specific research objectives, namely:

1. To design and set up an online learning object repository (LOR) for language learners in schools in KwaZulu-Natal;
2. To install various freeware re-usable language learning objects (RLOs) in the LOR;
3. To test out the operation of the LOR in terms of teacher and learner access to language learning resources;
4. To obtain responses from users in terms of its potential for facilitating language learning in schools in KwaZulu-Natal.

As artefact design using action research is a cumulative, cyclical process, however, the above four objectives did not fit neatly into four sequential phases. Two main phases were involved: artefact design and artefact testing. Table 4.2 shows how these correspond with the above objectives. After some general aspects of artefact design have been dealt with, the various cycles of development within these phases will be described in Chapter 5.

Table 4.2 Cycles of development, objectives and design process followed

	SPECIFIC OBJECTIVES	DESIGN PROCESS
PHASE 4	1. To design and set up an online learning object repository (LOR) for language learners in schools in KwaZulu-Natal; 2. To install various freeware re-usable language learning objects (RLOs) in the LOR;	*ARTEFACT DESIGN* 1. Identification of social need and artefact specifications 2. Artefact design and initial testing, resulting in CALL-VLC
PHASE 5	3. To test out the operation of the LOR in terms of teacher and learner access to language learning resources; 4. To obtain responses from users in terms of its potential for facilitating language learning in schools in KwaZulu-Natal.	*ARTEFACT TESTING* 3. Usability testing of CALL-VLC 4. User feedback on CALL-VLC

4.6 Levels involved in the methodology

As mentioned earlier (pp. 24, 28 and 53), stratification is a common motif in critical realism, and occurs in both the various phases of the methodology mentioned above as well as in the different levels involved. The three different levels at which the methodology can be seen to operate are as follows:

- Technical (i.e. material)
- Systemic
- Theories of social structure

At the technical (material) level, the artefact needed to be constructed so that it would work to specifications, including ease of use. At the systemic level, the LLOR is a mechanism intended for educational service delivery (i.e. to provide teaching/learning resources). At the level of theories about social behaviour, the artefact is informed by Bhaskar's and Archer's critical realist theories of social structure, in this case, focusing on how technology might be used to transform social structure.

These three levels all operate in the processes described in phase 3 and 4 (see Table 4.2 above). However, at times, certain levels will be emphasised. For example, in the first stage of artefact design (identification of social need and artefact specifications), the systemic is emphasised as well as the technical, whereas in stage two (artefact design and initial testing), the focus is more on the technical aspects of the LLOR. Usability testing focuses on the individual human aspect of HCI (i.e. in terms of user-friendliness). In stage four (user feedback on CALL) all three levels are involved, but the social situation now comes to the fore in terms of revealing relations of power, the current educational situation and the situational logics generated by the logic of the various belief systems involved.

4.7 Methods used for artefact testing

Usability and end-user feedback were obtained using open and close-ended questionnaires and interviews. Purposive sampling (Miles & Huberman, 1994; Bauer & Gaskell, 2000) was used so as to select a representation of role-players based on their different experience, insights and roles. According to Huberman and Miles (1984), qualitative research tends to be purposive in the selection of population group or participants rather than using random sampling, because qualitative research does not claim to be representative.

In order to get a spectrum of responses at various levels, participants included:

- Expert users
- Teachers
- Teacher trainers
- School management (HoD)
- Subject advisors

The “expert users” were chosen as they worked in the EdTech Section of a university as they had a background of designing applications and staff educator training in digital media and e-Learning. Teachers were consulted as they were the targeted end-user group. Teacher trainers might, however, have a better long-term view of technological developments in Education and how

these might be received by various educators. The school management representative had just graduated in a Language Practice degree programme at doctoral level, and was thus very much in touch with current educational language research; as an HOD at a school, he would also be expected to have insight into how schools and teachers operated in terms of adapting (or not) to innovations. The last-mentioned was a Technology subject specialist, giving him some insight into use of technology in Education, but was also registered for the DTech in Language Practice, so had some background in language-related research.

Three types of questioning were carried out, namely; a web-based survey comprising of questions about the "Usability of the LLOR" (in Appendix A), then rating questions about the content appearing in the LLOR (in Appendix B); the second type was a person-to-person interview with a DOE (Department of Education) educational specialist which was recorded (audio), extracts of this are in Appendix B; the third type was email interviews of expert users; teachers, former teachers, school management and teacher advisors. Transcripts from these interviews are in Appendix C. All respondents were assured of anonymity and confidentially (see "Letter of Consent" in Appendix D).

4.8 Conclusion

The phases in Table 4.1 which will be described in the next two chapters are as follows:

Chapter 5: Artefact design

In order to design and set up an online learning object repository (LOR) for language learners in schools in KwaZulu-Natal (as per objective 1.) it was necessary, firstly, to identify the social need for which the artefact catered, and the specifications which might address these needs. Artefact design and initial testing, involving exploring the cycles of available platforms, culminated in the production of the CALL-VLC artefact with sample freeware re-usable language learning objects, achieving objective 2.

Chapter 6: Artefact testing

This chapter deals with usability testing and end-user feedback on the LLOR. To test out the operation of the LOR in terms of its giving teachers and learners access to language learning resources (objective 3), usability testing of the CALL-VLC artefact was carried out, and end user feedback was obtained from various role-players, including educators at inspector level, in teacher training, and in schools. The latter was done to gauge the potential of the LLOR (or similar artefacts) for addressing language learning needs in KwaZulu-Natal (achieving objective 4).

Chapter 5: Artefact Design

5.1 Introduction

The previous section emphasised the importance of adopting a philosophical approach (critical realism) and a substantive theory (Archer's morphogenetic approach) which suggested a modus operandi for analysis which is congruent with the philosophical approach. This section deals with the process of artefact design (Hevner, March, Park & Ram, 2004) for a specific intervention, namely, the Language Learning Object Repository (LLOR). In order to design and set up an online learning object repository for language learners in schools in KwaZulu-Natal and install various freeware re-usable language learning objects (RLOs) in it (objectives 1. and 2.), it was first necessary to identify the social need for which the LLOR catered, and next, the specifications which would address those needs. The social needs were identified in the literature dealing with literacy in KwaZulu-Natal. The design procedure followed was mainly informal (Bowen & Reeves, 2008: 125), which meant that the specifications were done on behalf of the intended audience, rather than in collaboration with it. This was because the scope of the project was too broad, and beyond the conceptualisation of the majority of the proposed end users). The resulting specifications are then given. The rest of the chapter deals with the cycles leading to the development of the LLOR, comprising a review of known stacks[4], the setting up of known and potential stacks, creation of partial content and final selection.

5.2 Identification of social need

The LLOR targeted teachers and students from public government funded schools in KwaZulu-Natal, South Africa. As mentioned in Chapter One, "The aim in this study was to make an attempt to empower teachers with access to relevant resources in an easy to access and navigate online nexus, in the form

[4] Stack: This refers to the combination of a script and database within a web server (see Table 5.2)

of a Language Learning Object Repository (LLOR)." This would achieve the short-term goal of intervening to assist teachers/learners with access to digital resources, and would work towards the long-term goal of changing attitudes to use of digital resources in teaching/learning, potentially changing the social structure of education towards full use of digital resources.

The social need has in fact already been identified in recent research into literacy and literacy acquisition in KwaZulu-Natal (Govender, 2011; Pooran, 2011; Dorasamy, R.S., 2012; Naidoo, 2012; Peat, BM, 2012). To sum up the points emerging from the Literature review (see p.13):

- Teachers are not sufficiently trained to teach English as a second language;
- The increasing numbers of isiZulu-speaking students seeking entry into English-medium schools are not sufficiently fluent to benefit from instruction in the medium of English;
- Large student numbers make teaching difficult;
- Suitable teaching schematics or materials are often not available;
- Student resources in the form of text books are often not available;
- Those resources which are available are often not suited to specific student interests or needs;

It is clear from the above that that service delivery by the South African Education Department is unsatisfactory. As Makhubu states:

> The issue of service delivery in general (i.e. and not just for interpreting) is a crucial one both internationally and locally. In the Preface of McDonald and Pape's book on *Cost recovery and the crisis of service delivery in South Africa*, Professor Dennis Brutus is quoted as saying: "At present millions of South Africans face severe problems in accessing even the most basic services: water, sanitation, electricity, and refuse removal" (2002: viii). Ahmad, Devarajan, Khemani and Shah (2005) provide a report on attempts to improve service delivery worldwide through decentralization, in which over 75 countries, including South Africa, have engaged. Khumalo, Rapoo and Ntlokonkulu (2003) report on alternative forms of service delivery at local government level in South Africa. Public protests

> and increasingly violent demonstrations against poor service delivery have recently featured in the South African media (Kubheka, 2011).

At the time of writing this dissertation schools are just recovering from punitive strike action in which unions attempted to have the Minister of Basic Education in South Africa, Ms Angelina Matise Motshekga, removed from her post for alleged incompetence (Books critical to learning and teaching, 2012).

Using the systemic modelling process developed by Robert Franck (2002), Makhubu (2012) arrived at the system of functions necessary for service delivery to take place, namely that service delivery must be:

1. **contextualised** to establish what setting and participants are involved, what type of service is required, and to what extent the service is feasible;
2. **sanctioned** by some form of authorisation and/or consent by authorities and/or participants;
3. **resourced** by human, financial and infrastructural resources.
4. **organised** by the service provider/s so that it is implemented smoothly and efficiently; and
5. **regulated** by means of interpreting codes of conduct, provisions of institutional policies (including quality policies), regular monitoring, and feedback from clients and service providers (from Table 4.1, Makhubu, 2011: 115, slightly adapted).

Makhubu also points out that an input option is necessary when considering the practical application of these functions in actual instances of service delivery (in her case, a university interpreting service). If one considers that, in the current context, there is a lack of consistency in terms of operations of schools, that these are geographically separated by wide distances, and that the influx of isiZulu-speaking students to English medium ex-model C schools is diluting even further the former “centres of excellence” in learning, it is clear that it is not just a question of supplying more text books or laying on more teacher training courses. Thinking out of the box is necessary here, first by moving laterally to computers and the Internet which Facebook and Twitter have made popular with South African youth - and young teachers – almost overnight, and,

ultimately, by moving to mobile learning (which is, however, not within the scope of this dissertation).

To apply the model of service delivery to English language teaching and learning in KwaZulu-Natal, the proposed LLOR is **contextualised** in terms of being set on the Internet, which has positive connotations for learners in terms of the popularity of social networking sites, and solves the problems of both cost of and distribution access of hard copy resources and teacher training staff and venues. The LLOR thus exploits the ubiquity of the Internet. The LLOR is **resourced** virtually cost free, as teaching/learning resources are either freely available on the Internet, or supplied by users. The main cost of the LMS used and the maintaining of the online server/s, but this has been accommodated for in the design. Depending on the initial reception and operation of the LLOR, funding will be sought to continue the project. The LLOR is currently and will continue to be **organised** by the researcher. To be **sanctioned**, the LLOR needs to be accepted by both teachers and learners, and must have some authority in terms of its content being relevant to both learner needs and current school syllabuses. Buy-in by the Department of Basic Training is not essential, but would be an advantage. The LLOR will be **regulated** by the researcher's curation and in response to feedback from educators and learners. The basic specifications of the LLOR were then worked out to accommodate the factors emerging in the service delivery model.

5.3 Basic specifications of the LLOR

The basic specifications[5] of the LLOR were as follows. It should:

- be easily accessed by educators and learners.[R]
- be easy to operate with minimum training for entry use.[R]
- contain content appropriate to language learning in schools in KwaZulu-Natal (i.e., curated). [O;RG]
- be able to support contributions from users. [S; R; RG]

[5]The service delivery functions which the LLOR is designed to deliver are coded as follows: Contextualised: C; sanctioned: S; resourced: R; organised: O; regulated: RG.

- have a user input option which is simple to effect. [S; R]
- enable content to be easily extracted for use. [R]
- organize resources according to school grade or lesson content type. [O]
- It must be set up on a free or relatively inexpensive web hosting environment. [R]
- support the creation of personal spaces for users (e.g. accounts, logins) to encourage the development of a community of practice in language teaching/learning. [C]
- support the embedding of content from other websites (i.e. syndication and RSS). [R]
- have a brand affinity which encourages use. [S; C]
- be sustainable and supported by the wider open source community. [C; R]

To sum up, the LLOR resources must be time and cost effective, sustainable, self-renewing, attractive to users, and based within the social context of teaching/learning. These specifications were necessary in order for the LLOR to fulfil its purpose (i.e. provide easily accessible teaching/learning resources to teachers/learners in KwaZulu-Natal) in its intended context (cash-strapped Educational system in KwaZulu-Natal) for intended users (mainly economically disadvantaged teachers/learners). The intended curatorship by the researcher also poses economic constraints, as no funding has as yet been obtained to support sustainable development.

5.4 Other models of LLOR currently available

As mentioned in the Literature Review, notable LLORS that were already in operation at the onset of this research initiative included, the FLORE (French Language Object Repository for Education (http://flore.uvic.ca/) and Merlot (Multimedia Educational Resource for Learning and Online Teaching) (http://www.merlot.org/merlot/). The LLOR designed in this research (CALL-VLC) was based on some of the models evident in the FLORE and Merlot repositories, such as facilitating user-contributions to the collection. Thutong, also in operation when the CALL-VLC was being developed, is a national

educational content resource available to the public, consisting of teaching and learner materials according to level (grades) and policy documents[6]. However its strength (aimed at a large audience), while laudable, was also its weakness, as it was difficult to find specific resources unless the user had intermediate or advanced search skills. In Archer's terms, the "cost" of change would be too high, as it required specialist skills and was not time-effective. The advantage of the LLOR designed in this research is that it provides an *organising* capacity, which contributes and consolidates resources; it is more specialised as to its subject content (i.e. language teaching/learning). While other LORs do have the capacity for users to add new resources, not all of these facilities are easy to master, and the LLOR designed here has a user-friendly input option (as confirmed by users in later testing, as will be shown in the usability tests and analysis).

5.5 Detailed specifications of the LLOR

Following from the basic specifications of the LLOR given above, the following key specifications were applied to the LLOR in terms of technical issues, content and the intended users.

5.5.1System requirements

Components included the following (minimally): *cost*, *database*, *license, web server*; but also (in general): application server, approximate, operating system and the programming language.

5.5.2 Security

Components included the following: content approval, granular privileges, login history, session management and versioning.

[6]Whilst policies are expected to play a role in how teaching happens, there are vast differences in scope and latitude afforded by the school system and that of higher education. This is discussed in Chapter 5.

5.5.3 Support

Components included the following: developer community, online help, public forum, public mailing list, third-party developers and user's conference.

5.5.4 Ease of use

Components included the following: drag and drop content, email to discussion, friendly URLs, spell checker, subscriptions, user interface levels, undo and WYSIWYG editor.

5.5.5 Performance

Features included the following: (minimally)static content export, but also: advanced caching, database replication, load balancing and page caching.

5.5.6 Management

Features included the following: (minimally) inline administration, online administration, themes/skins, and also: clipboard, content staging, web statistics, web-based translation management and workflow engine.

5.5.7 Interoperability

Features included the following: content syndication (RSS), FTP support and WebDAV support.

5.5.8 Flexibility

Features included the following: content reuse, extensible user profiles, interface localization, metadata, multi-lingual content, and multi-lingual content integration.

5.5.9 Built-in applications

Features included the following: blog, chat, discussion/forum, events calendar, FAQ, Management, file distribution, Help desk, My Page/Dashboard,

newsletter, photo gallery, polls, search engine, site map, surveys, tests/quizzes, time tracking, user contributions, web services front end and wiki.

5.6 Cycles leading to the development of the LLOR

This section describes the cycles of developing the stacks, with a usability analysis involving feedback from experienced e-Learning educators. As part of this process, the cycles leading to the completed iteration of the LLOR are described. In order to ensure that insights about both the planned methodological approach and the "organic" (i.e. "on the fly" or developmental processes) are documented, these will be unfolded as they occurred, starting with the cycles leading to the development of the LLOR.

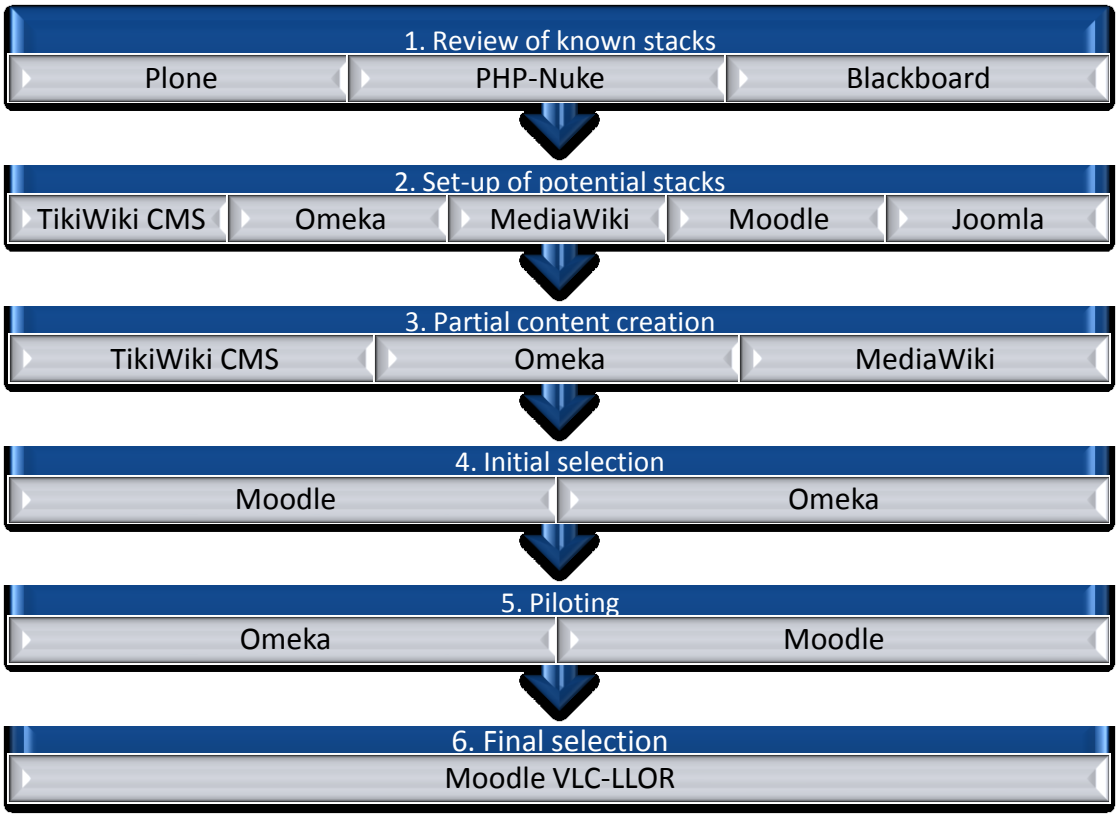


Figure 5.1 Cycles leading to the development of the LLOR

Before finally settling on Moodle to be used as the stack chosen (comprising PHP, MySQL and Apache), the researcher used a combination of analysis and testing with varying degrees of depth before adding actual content and

(embedding) a structure (classification). The cycles mentioned include the following: Cycle 1: Review of known stacks, Cycle 2: Set-up of potential stacks, Cycle 3: Partial content, Cycle 4: Initial selection, Cycle 5: Piloting and Cycle 6: Final selection (see Figure 5.1). Some of the cycles mentioned involved ratings as a means of comparison, but not all did, specifically Cycles 5 and 6. The definitions of the terms used in the cycles are given in Table 5.1. These are the "working definitions" as used in this research project and may not necessarily be "dictionary" definitions.

Table 5.1 Definition of the terms used in describing Cycles 1 – 6

Term	Description
Script	A script (interpreted language) such as PHP, Perl, Python, Ruby and so on.
Database	A structured set of data held on a computer, especially one that is accessible in various ways.
Stacks	This refers to the combination of a script and database within a web server.
Portability	Degree to which a "stack" can be ported to different environments. Some stacks can be used only within an online internet-enabled device, whilst some stacks can also be used in an offline environment.

5.7 Cycle 1: Review of known stacks

Cycle 1 involved evaluating stacks (i.e. scripts, database and web server) which were already known to the researcher, before exploring new options. The researcher had hands-on experience with Plone, PHP-Nuke and Blackboard, which made the review of these relatively easy. The review of these stacks comprised ratings, a summary of which is included in 5.7.4. However, an overall impression of suitability for the task was a more important consideration, and this is explored first in the sections below. The researcher's hands on experience with Plone, PHP-Nuke and Blackboard made the review of these easier. There were limitations (mainly financial) to what could be used technically, in addition related limitations in terms of time available to the researcher to test and develop the artefact. Definitions of the terms used in describing Cycle 1 are given in Table 5.2.

Table 5.2 Definition of the terms used in describing Cycle 1

Name	Type	Description	License
Plone	CMS	Uses *python* as the code base, Zope as the application server and stores all information in Zope's built-in transactional object database (ZODB).	Open Source
PHP-Nuke	CMS	Uses PHP, MySQL and works on most web servers.	Open Source
Blackboard	LMS	User PERL, and either Oracle or SQL as the database with Tomcat as the webserver on either Windows or Linux operating systems.	Proprietary

5.7.1 Plone content management system

The homepage of the Plone content management system (CMS) is shown in Figure 5.2.

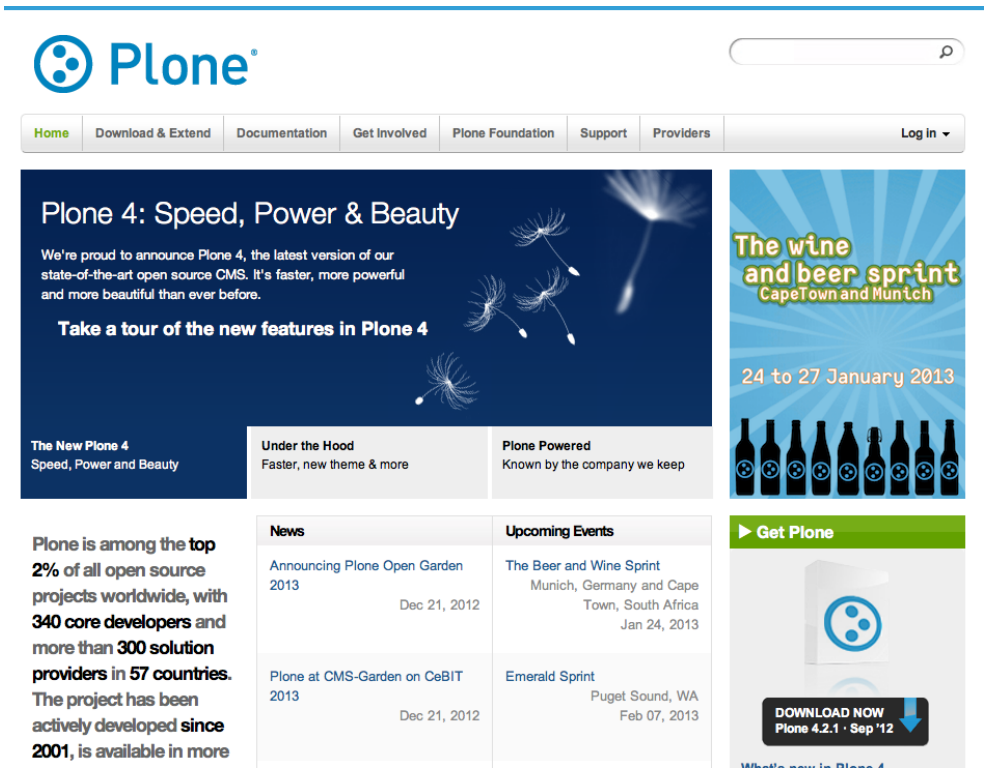


Figure 5.2 Homepage of Plone (http://www.plone.org)

The Plone CMS offers features that are not found in most comparable CMSs, particularly the option of “undoing” changes for an unlimited number of times. This feature is due to the design of the system, which uses a single database (ZODB) that commits all changes, and therefore these can easily be reversed.

As a result of its powerful design, the requirements for installing and running it are also very exacting. It cannot be set-up on any regular web host but needs to be set-up in a dedicated hardware environment: this was basically the reason that the researcher was unable to use Plone (i.e. cost). However, the Plone environment can be used to host other websites, including some CMSs, and in the future it may be possible to set it up on a dedicated server to take advantage of Plone’s robustness.

5.7.2 PHP-Nuke content management system

The homepage of the PHP-Nuke content management system is shown in Figure 5.3.

Figure 5.3 Homepage of PHP-Nuke (http://www.phpnuke.org)

PHP-Nuke is one of the forerunners of a “block” or “modular” type of design. It has provided the blueprint for many CMSs which have either been direct offshoots of it or have used its design as the basis for theirs. Based on the experience of the researcher as a DUT Educational Technology practitioner, it was considered to be ideally suited for a magazine or publishing environment but not for the purposes of the CALL-VLC, which was intended to be used in a teaching context. It is possible that with enough customisation PHP-Nuke CMS could be re-themed to meet the design specifications detailed in Chapter 3. However, it was decided that the time required for doing this to meet the requirements of this project would be excessive.

5.7.3 Blackboard learning management system

Figure 5.4 shows the homepage of a WebCT course designed in 2002 and piloted for postgraduate Business Communication courses at DUT. DUT obtained the Campus Edition (CE) license from 2000, changing to the Blackboard license when the latter took over WebCT and the name changed to “Blackboard”.

The researcher had access to Blackboard, as the system administrator, had completed the WBL module,[7] and had been involved as an academic developer in staff induction to e-Learning. However, Blackboard was not a suitable LMS for the master’s project because the licensing agreement was restricted to DUT credit-bearing courses involving DUT staff and students. The proposed LLOR, on the other hand, was intended for use by educators who were not DUT staff members. Furthermore, In terms of positioning, the CALL-VLC application was intended to be in line with other community projects in terms of low-cost operation, cost-free accessibility and sustainability.

[7] A non-credit bearing module of the Post Graduate Degree in Higher Learning, or PGDHE, offered at the University of KwaZulu-Natal.

Figure 5.4 WebCT for Dummies on Blackboard (http://edtech.dut.ac.za)

5.7.4 Rating[8] of known stacks

Table 5.3 gives the rating of known stacks reviewed in Cycle 1. This will be accompanied by a discussion of the ratings and implications for the next stage in the identification of a suitable stack for the CALL-VLC LOR. The purpose of evaluating the stacks in Cycle 1 was to establish if it was possible to use one of these for the CALL-VLC LOR. However, the ratings that were applied were not intended to eliminate or "select" one of the three stacks; instead they served as a reference against which future ratings done on other stacks could potentially be gauged. The results and the process followed may prove useful for those who are making the same or similar decisions in their sphere of work. The ratings of PLONE, PHP-Nuke and Blackboard are discussed below in order of the highest rated to the lowest overall, with a focus on some of the key attributes mentioned in Table 5.3.

[8]Ratings are maximum of "10" and minimum of "0", the higher the rating the better the "stack".

Table 5.3 Rating of known stacks (Cycle 1)

Attribute	Ratings for each stack		
	Plone	PHP-Nuke	Blackboard
System requirements	3	8	3
Security	10	8	10
Support	6	4	10
Ease of use	7	8	6
Performance	10	8	10
Management	9	7	6
Interoperability	7	7	3
Flexibility	8	6	3
Built-in applications	8	6	5
Overall stack rating	5	7	4
Total	**67**	**64**	**62**

a. Rating of Plone

Plone scored 67 in total, which was the highest rating amongst the three applications that were reviewed. It was a very *secure* application in terms of preventing unauthorised access, but, whilst this is desirable, it detracted from the *system requirements*, which scored low. The high rating indicates that the system itself is highly suitable, but that the key issue of system requirements was not satisfied, which led to its being eliminated. The actual fiscal cost of the system requirements was a prohibitive factor, as this project was self-funded by the researcher. Overall this stack performs above average across most of the attributes shown in Table 5.3, barring the system requirements.

b. Rating of PHP-Nuke

PHP-Nuke was given a rating of 64, and in contrast to PLONE and Blackboard, had quite low system requirements. This is understandable, as it was architected for a wide user-base using easily and cheaply available architecture (with the exception of web-hosting, the underlying stack is available free of charge). It still however, scored extremely well on security, ease of use,

performance, management, inter-operability and overall stack rating. It fared less well in terms of support, flexibility, and the number of built-in applications it contained. In the final analysis PHP-Nuke was a prime stack to be considered for use as the CALL-VLC, and might even have been considered for further piloting if more time has been available to test it out.

c. Rating of Blackboard

The Blackboard system is a licensed product which is prohibitively costly, and, although the researcher is the Blackboard administrator at the higher education institution at which he works, and access to the system would have been easy to arrange. However, a critical realisation emerged during the preliminary stages of this research initiative, namely, that “research driven” projects are by default restricted to a relatively short “project lifespan”, which implies that they will not be sustained beyond what has been blueprinted in the conceptualisation of the project. The differentiating aspect of this research initiative was that the project would be sustainable, and, although it was still worth evaluating Blackboard alongside the other competing stacks, it was - realistically - not going to be considered for further piloting, as the institution could not guarantee that it would be able to finance the on-going licensing of this product in the future. Other similar institutions have chosen alternative products, partly based on the licensing cost, amongst other factors. In rating Blackboard, system requirements include in part the licensing cost and also the hardware system, which is quite exacting. Whilst virtualisation is supported and encouraged, a two server stack is recommended (application and database servers) with a second application server to be used in a load-balanced configuration.

The rating of 62 which Blackboard received is thus not a reflection of its overall suitability in the context of Learning Management Systems, but its unsuitability for this particular context, in which the LMS is to be used as a sustainable option for the CALL-VLC.

5.8 Cycle 2: Set-up of potential stacks

The following systems were set up as potential stacks (i.e. the combination of a script and database within a web server) for the LLOR:

- TikiWiki CMS- A free and open source web application with a number of built-in features.
- MediaWiki- A free open source software wiki[9] package, originally developed for use by Wikipedia, but now used by numerous other projects.
- Moodle - A freeware virtual learning environment aimed at higher education.
- Joomla - A content management system which can be customised for multiple audiences.

The purpose of setting up the above stacks was for testing suitability for the proposed LLOR, which was the next level of artefact design. There are many common features in the known stacks already mentioned (see Table 5.4), which shared popularity and user support, and offered users free themes as well as numerous plugins and extensions (which probably accounted for their popularity).

Table 5.4 Common features of known stacks

Shared aspects	Description
Popularity	Large user-base.
Strong support community	Active and informative support community on the Internet and also printed resources (books and manuals).
Template/theme based	Contained many free themes/templates which make it easy to customise the site.
Plugins/extensions	Added functionality through plugins/extensions most of which are free and open source, although licensed products are available for purchase.

[9] A “wiki” is a website accessed by a community of users who can edit the content.

5.8.1 Tiki Wiki

Tiki Wiki is a free and Open Source web application with a number of built-in features, including a familiar Windows “type” File manager. Tiki Wiki claims to have more features out-of-the box then comparable Wiki projects such as MediaWiki. In contrast to MediaWiki[10] and Joomla, both described as the “small-core-and-add-what-you-need” model, Tiki Wiki is an “all-in-one model.” At the time of testing, however, it was still a nascent project with very little supporting resources such as themes. The homepage is shown in Figure 5.5.

Figure 5.5 Homepage of Tiki Wiki CMS (http://www.tikiwiki.org)

[10] http://www.shocksite.com/Tiki+Wiki+comparative+charts+Drupal+MediaWiki+Twiki+SharePoint+Wordpress

5.8.2 MediaWiki

MediaWiki is free software open source wiki[11] software, originally developed for use by Wikipedia, but used now by other projects. The homepage is shown in Figure 5.6. According to Deng:

> MediaWiki is free server-based software which is licensed under the GNU General Public License (GPL). It's designed to be run on a large server farm for a website that gets millions of hits per day. MediaWiki is an extremely powerful, scalable software and a feature-rich wiki implementation that uses PHP to process and display data stored in a database, such as MySQL (Deng, 2013).

MediaWiki is designed for large server farms and therefore not suitable for small-scale shared web hosting environments such as the LLOR.

Figure 5.6 Homepage of MediaWiki (http://www.mediawiki.org)

[11] A "wiki" is a website accessed by a community of users who can edit the content in the browser.

5.8.3 Joomla

Joomla is a free and open source content management system (CMS) for publishing content on the World Wide Web and intranets (where an Internet connection is not a pre-requisite). The homepage is shown in Figure 5.7. Reichardt describes Joomla as follows:

> Joomla is an open source content management system for publishing content on the Web and intranets. It is written in PHP language and uses database system MySQL to store information. The first version of Joomla was released in 2005 and was an offshoot of an Australian CMS called Mambo; since then there have been several updates to the original version (2009).

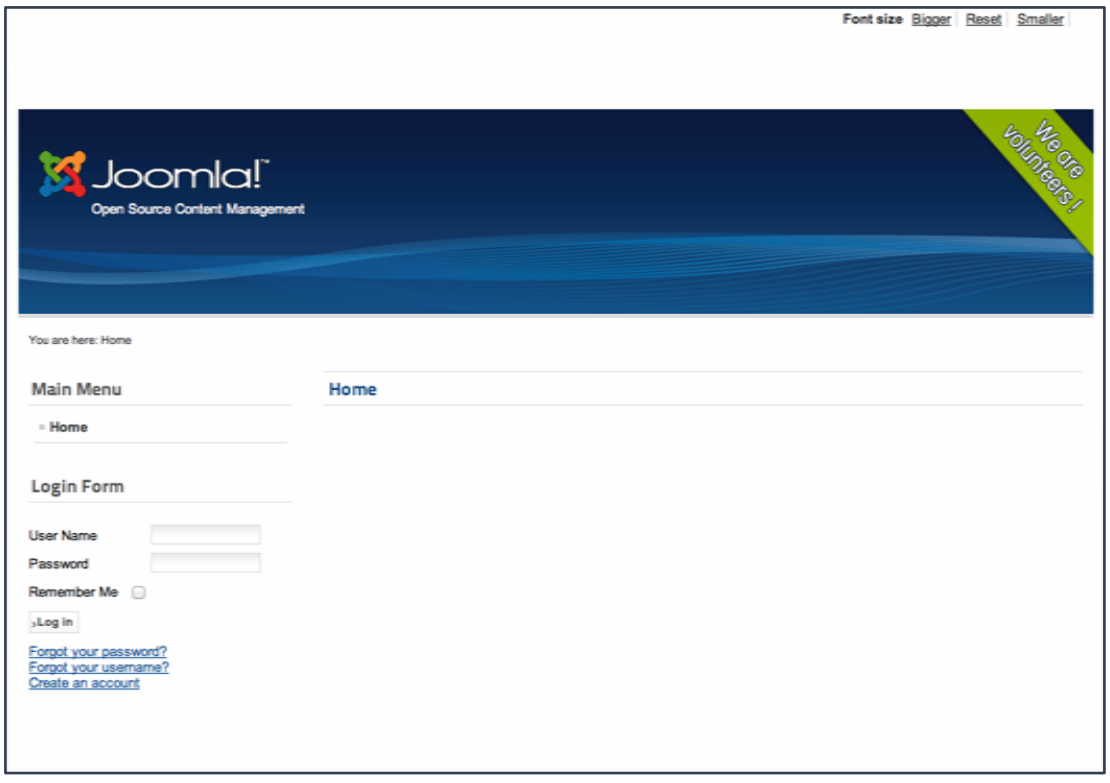


Figure 5.7 Homepage of Joomla

Joomla comprises an administrator (control) panel and a user based (control panel), users are created by the administrator who has to also set-up the initial Joomla site. By default the Joomla site functions as a blog and it requires the

creation of menus, sections and categories in order to make it function more like a traditional website (the classic structure consisting of a home page and child pages beneath it). Users are given permissions to contribute “articles” and all the content can be created and edited in the browser, thus there are no requirements to have either html skills or to use web design applications such as FrontPage, DreamWeaver and so on. Sophisticated workflows can be created to enable multiple users’ access to publishing content in different sections without requiring the actions of an administrator.

5.8.4 Moodle

Moodle is a freeware virtual learning environment aimed at higher education. The homepage is shown in Figure 5.8. Moodle is an acronym for “Modular Object-Oriented Dynamic Learning Environment”. The “modular” aspect refers to the fact that the LMS is built up in modules. Moodle is “object oriented” in the sense that it followed the object-oriented model of programming: “Object-oriented programming (OOP) is a programming language model organized around ‘objects’ rather than ‘actions’ and data rather than logic” (Rouse, 2008).

Moodle is “dynamic” in view of its flexibility and easy adaptability. The Moodle site, however, downplays the original source of the name, which, it states, was of more use to programmers and education theorists, and adds:

> It’s [i.e. Moodle is] also a verb that describes the process of lazily meandering through something, doing things as it occurs to you to do them, an enjoyable tinkering that often leads to insight and creativity. As such it applies both to the way Moodle was developed, and to the way a student or teacher might approach studying or teaching an online course. Anyone who uses Moodle is a Moodler (Foster, 2013).

Moodle was eventually chosen as the LMS for the LLOR, as will be discussed at the end of this chapter. The decision was not entirely based on the ratings, but also on factors such as content portability (in and out) in the case in limited Internet access, as will be shown.

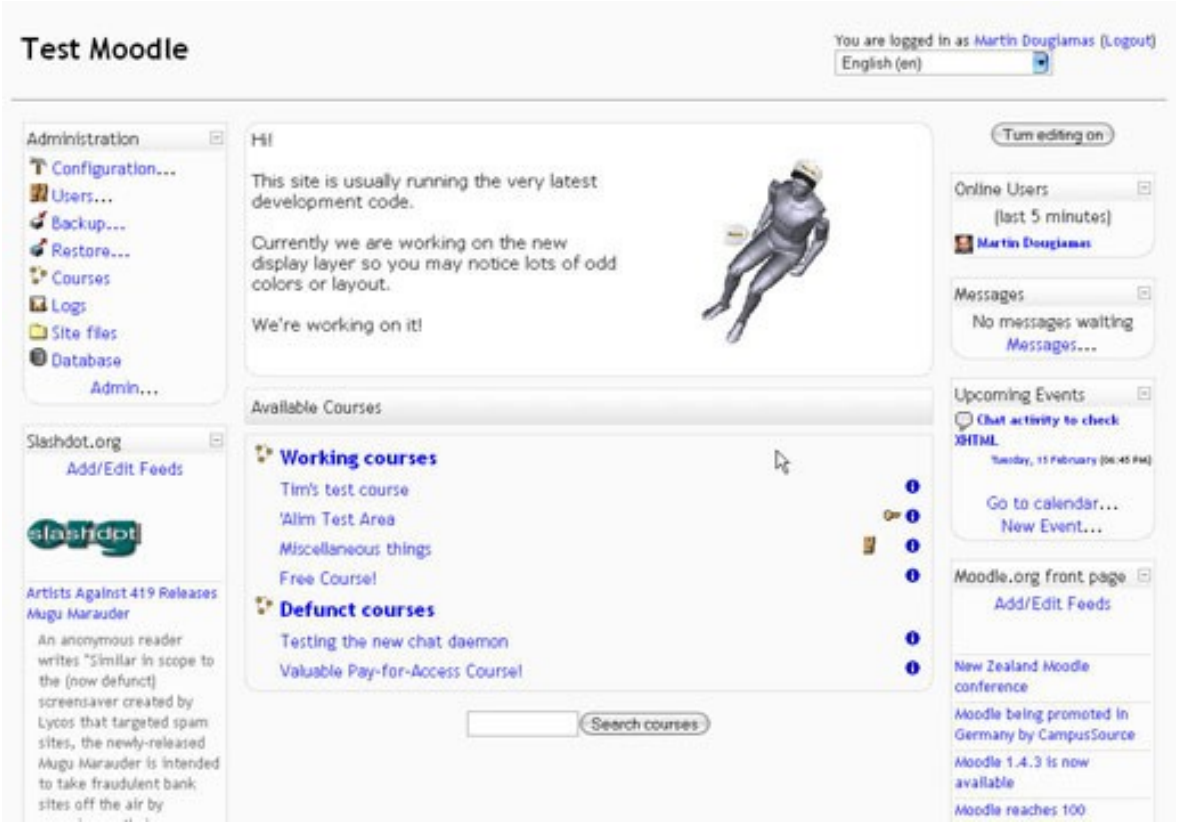


Figure 5.8 Homepage of Moodle

5.8.5 Rating of potential stacks

Table 5.7 gives the rating of the potential stacks reviewed in Cycle 1. Ratings range from a maximum of “10” to a minimum of “0”; the higher the rating, the better that attribute of the “stack”. It must be noted that the ratings totals do not automatically signal that the highest rated stack overall is the best choice for the CALL-VLC artefact. As was mentioned earlier, the purpose of the rating was to identify potential CALL-VLC stacks.

a. Rating of TikiWiki CMS

TikiWiki CMS had low system requirements meaning that it could be hosted on a relatively in-expensive web host and the installation would be quite straight-forward. This is off-set by its low security rating which is common with Open Source software since the collective are depended on to identify and close

security loop-holes. There was some support available in the form of forums, FAQs, manuals and the community of users via bulletin boards.

Table 5.5 Rating of potential stacks

Attribute	Ratings for each stack		
	Tiki Wiki CMS	MediaWiki	Joomla
System requirements	10	10	10
Security	6	10	6
Support	5	10	6
Ease of use	6	7	8
Performance	7	10	8
Management	6	6	5
Interoperability	6	6	4
Flexibility	6	5	4
Built-in applications	7	5	8
Overall stack rating	5	7	5
Total	64	76	64

However, beyond this there was little paid consultative support available. Some of the features were relatively easy to use, such as the File Manager (mirroring Windows explorer) and this stood out as a plus, but end-user ease of use was not as good. The performance was acceptable but without “benchmarking tests” at theoretical or real loads it was not possible to quantify this matrix. In terms of Interoperability, Flexibility and Built-In applications it measured reasonably albeit the stack had not been in existence for very long. At the time of testing, the TikiWiki CMS was still in the infancy of its software lifecycle so management was fairly complicated. The overall rating of 64 indicates a reasonable application that would be worthwhile monitoring for review at another time in the future.

b. Rating of MediaWiki

MediaWiki is particularly well supported and is a proven stack as evidenced by the iconic WikiPedia which is widely used by millions if not billions of users. In terms of the system requirements, “security”, “support” and “performance” it scored 10 indicating that these attributes had been proven through its use over a long time. MediWiki was designed with very exacting specifications resulting in it being ideally suited as a “wiki”; this also means that it would not suit the equally exacting but different specifications of the CALL-VLC. MediWiki requires a steep learning curve before mastering the administrative component which counted against it as a viable application for this project.

c. Rating of Joomla

Joomla has been rated as the leading content management system for the past 8 years or so. Its popularity and wide-ranging use across the different industries can be attributed to factors such as; open- source and available for free, updated frequently and secure, customisable and resourced (themes) by both the Joomla organisation as well as third-party providers, installation is supported by most web hosts (Go-daddy, Bluehost and so on) in non-technical three step wizard driven process, requires no technical skills (html or coding) by end-users when creating and publishing content (wysiwyg) but management of this (publishing workflow) is still maintained. In evaluating Joomla for use as the CALL-VLC it was considered a viable choice against all the criteria and rejected only because of aspects it did not support which are discussed in the section, 6.9 Final selection – Moodle VLC-LLOR (Cycle 6).

5.9 Cycle 3: Partial content creation

The only way of evaluating the stack once it was set-up was by populating it with content, which meant some form of partial content creation. An attempt was made to provide a variety of different language learning/teaching resources, as the intention was to test out usability rather than content. Two aspects were involved: (1) how easy it would be for users to access and (2) to contribute resources. The following resources were used for content:

- Slimekids - School Library Media Kids(games and word drills)

- Writing tutor - interactive composition tutor
- Word families - word formation
- Poetry (from *Adrian Mole*) – comprehension
- Comprehension - comprehension, reading (*Adrian Mole*).and poetry
- Lesson plans - Exemplars of English lesson plans (according to Grades) for teachers
- Grammar - Subject, verb and object

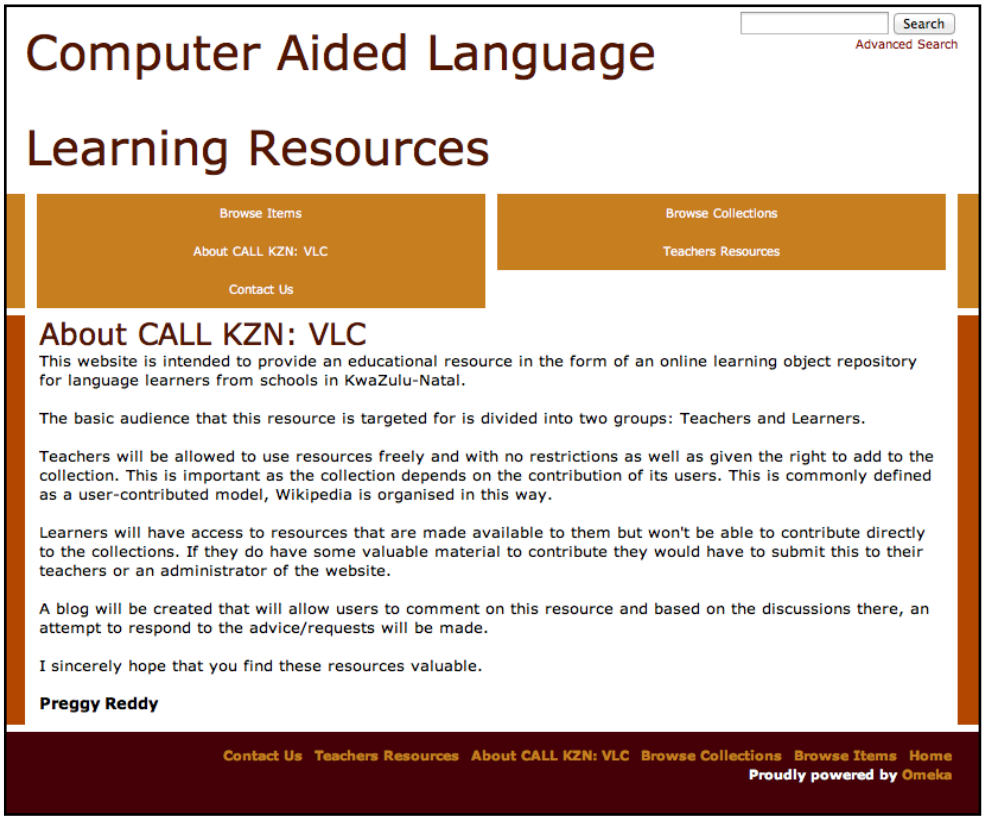


Figure 5.9 Homepage of Omeka (http://gravitysa.co.za/omeka/)

The language learning resources included as LLOR content were chosen as examples from various categories of resources which were freely available on the internet (e.g. tutorials, drills and exemplars). However, possible content was vetted for appropriateness for the South African context in terms of content

and variety of English (e.g. South African English).The homepage or default page of the CALL KZN:VLC (shown in Figure 5.9) consisted of an introduction, the purpose of the LLOR and a description of the structure of the website. The way in which the content is presented to users of the LLOR is illustrated by screenshots (Figures 5.10 to 5.15) showing how the language learning/teaching resources are categorised according to type (i.e. links, documents, software) and any subcategories relevant to specific types (as with documents).

Grammar - subject, verb and object

All Titles

Grammar - subject, verb and object

Title
Grammar - subject, verb and object

Subject
Subject, verb, object, performance activity, Formative Assessment, worksheet

Description
Learning Outcome 6: Language Structure and Use
The learner will know and be able to use the sounds, words and grammar of the language to create and interpret texts.

Creator
Thutong

Source
Thutong

Publisher
Thutong

Format
Word file in doc format

Language
English

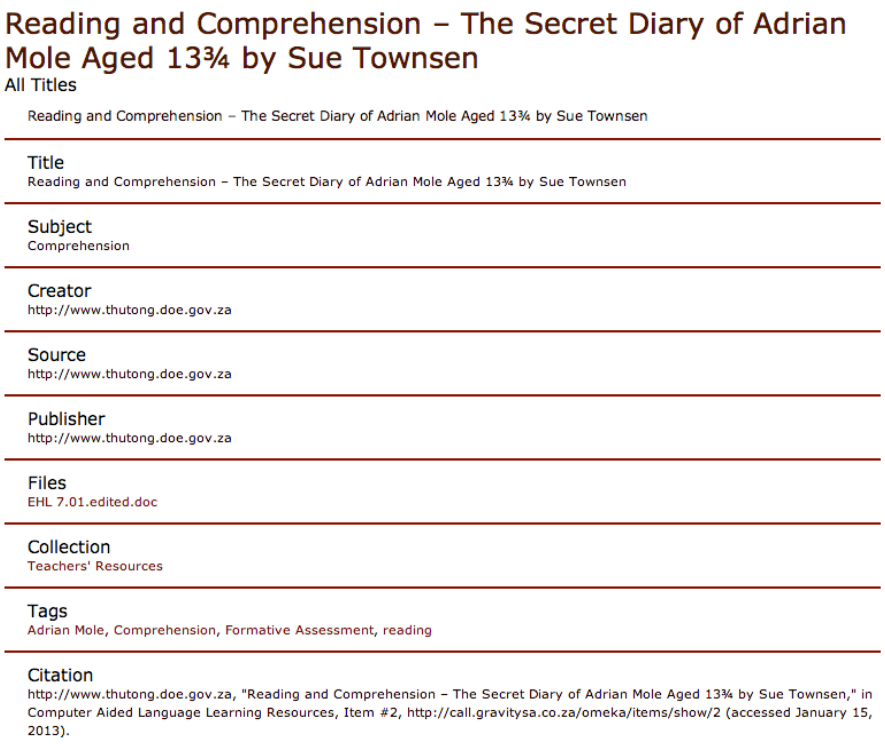
Files
EHL 7.20.edited.doc

Collection
Teachers' Resources

Tags
English, Grade 7

Citation
Thutong, "Grammar - subject, verb and object," in Computer Aided Language Learning Resources, Item #25, http://call.gravitysa.co.za/omeka/items/show/25 (accessed January 15, 2013).

Figure 5.10 Link to Word file consisting of “Grammar” assessment exemplar



Reading and Comprehension – The Secret Diary of Adrian Mole Aged 13¾ by Sue Townsen

All Titles

Reading and Comprehension – The Secret Diary of Adrian Mole Aged 13¾ by Sue Townsen

Title
Reading and Comprehension – The Secret Diary of Adrian Mole Aged 13¾ by Sue Townsen

Subject
Comprehension

Creator
http://www.thutong.doe.gov.za

Source
http://www.thutong.doe.gov.za

Publisher
http://www.thutong.doe.gov.za

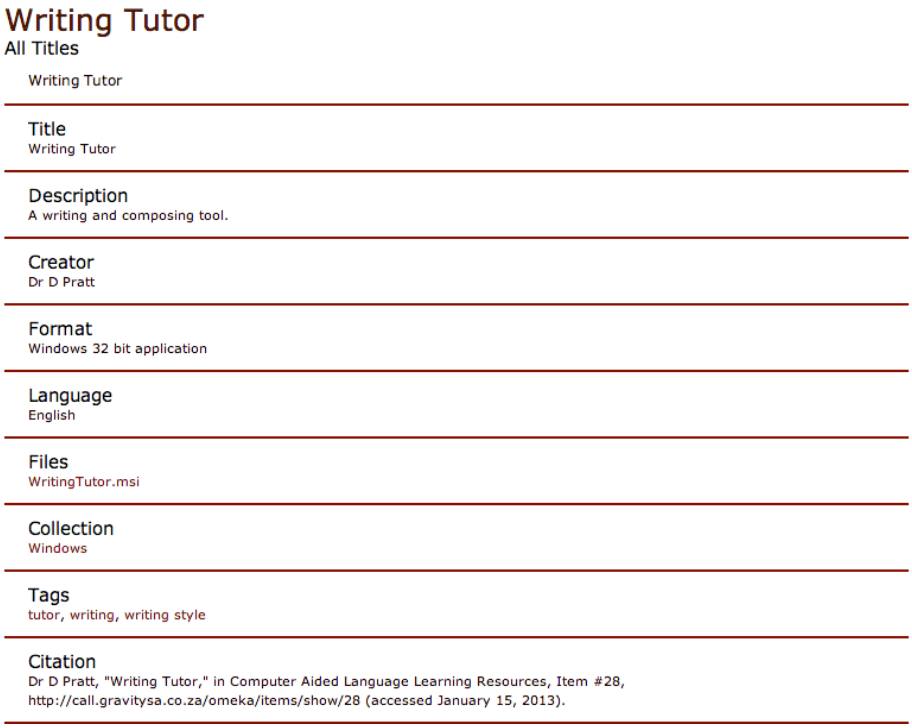
Files
EHL 7.01.edited.doc

Collection
Teachers' Resources

Tags
Adrian Mole, Comprehension, Formative Assessment, reading

Citation
http://www.thutong.doe.gov.za, "Reading and Comprehension – The Secret Diary of Adrian Mole Aged 13¾ by Sue Townsen," in Computer Aided Language Learning Resources, Item #2, http://call.gravitysa.co.za/omeka/items/show/2 (accessed January 15, 2013).

Figure 5.11 Link to Word file consisting of 'Reading and Comprehension' assessment exemplar



Writing Tutor

All Titles

Writing Tutor

Title
Writing Tutor

Description
A writing and composing tool.

Creator
Dr D Pratt

Format
Windows 32 bit application

Language
English

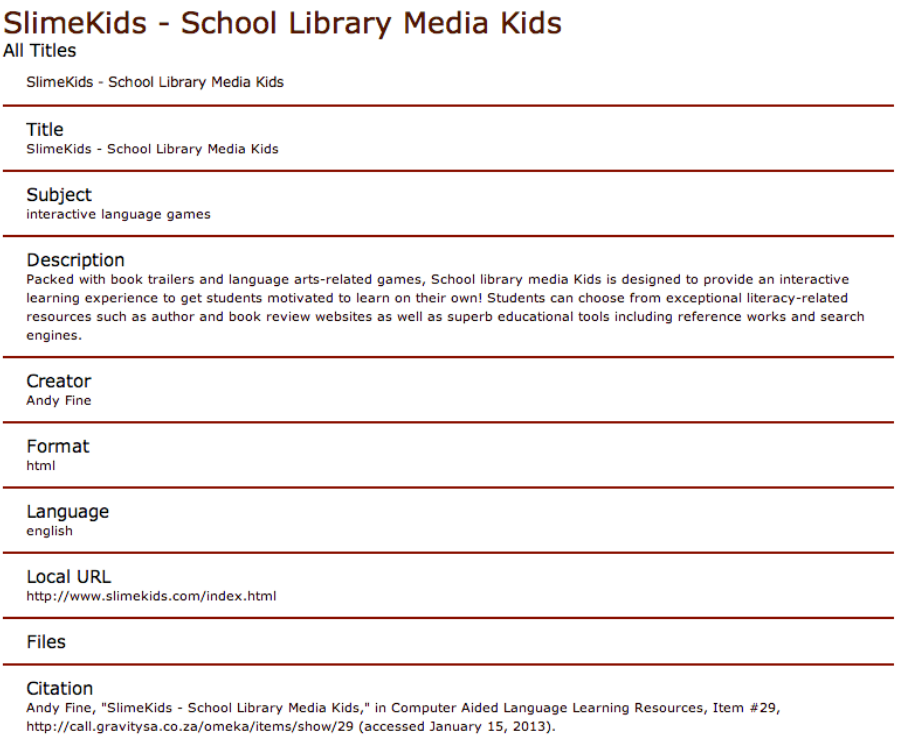
Files
WritingTutor.msi

Collection
Windows

Tags
tutor, writing, writing style

Citation
Dr D Pratt, "Writing Tutor," in Computer Aided Language Learning Resources, Item #28, http://call.gravitysa.co.za/omeka/items/show/28 (accessed January 15, 2013).

Figure 5.12 Link to Windows executable file - Writing Tutor



SlimeKids - School Library Media Kids

All Titles

SlimeKids - School Library Media Kids

Title
SlimeKids - School Library Media Kids

Subject
interactive language games

Description
Packed with book trailers and language arts-related games, School library media Kids is designed to provide an interactive learning experience to get students motivated to learn on their own! Students can choose from exceptional literacy-related resources such as author and book review websites as well as superb educational tools including reference works and search engines.

Creator
Andy Fine

Format
html

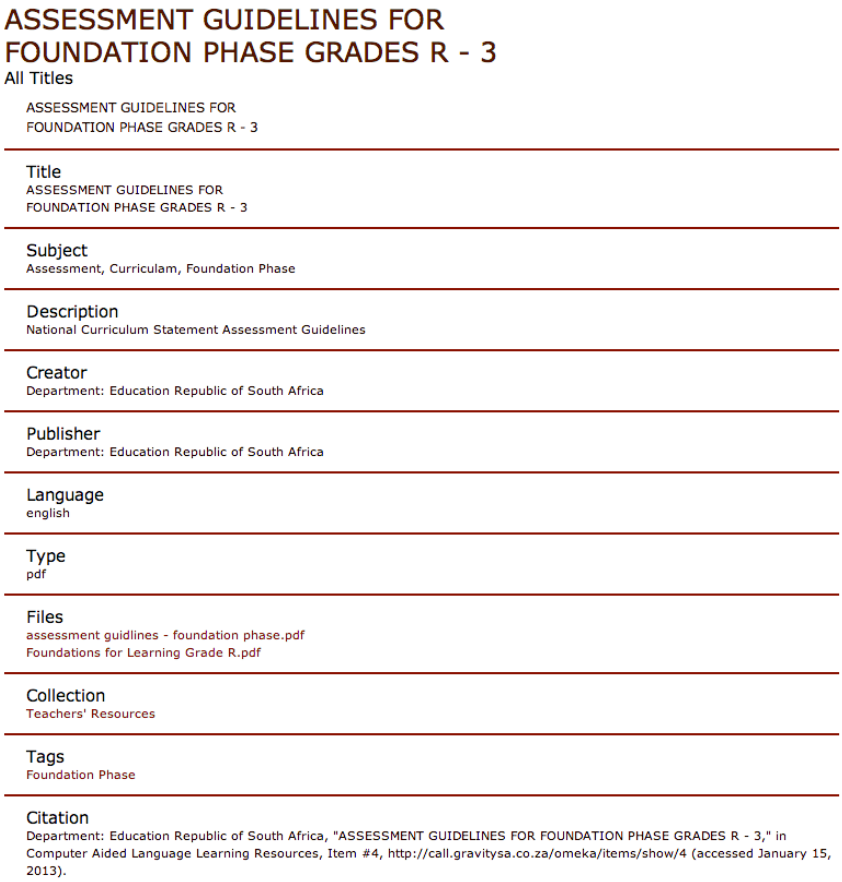
Language
english

Local URL
http://www.slimekids.com/index.html

Files

Citation
Andy Fine, "SlimeKids - School Library Media Kids," in Computer Aided Language Learning Resources, Item #29, http://call.gravitysa.co.za/omeka/items/show/29 (accessed January 15, 2013).

Figure 5.13 Web link to SlimeKids (School Library Media Kids) with annotation



ASSESSMENT GUIDELINES FOR FOUNDATION PHASE GRADES R - 3

All Titles

ASSESSMENT GUIDELINES FOR FOUNDATION PHASE GRADES R - 3

Title
ASSESSMENT GUIDELINES FOR FOUNDATION PHASE GRADES R - 3

Subject
Assessment, Curriculam, Foundation Phase

Description
National Curriculum Statement Assessment Guidelines

Creator
Department: Education Republic of South Africa

Publisher
Department: Education Republic of South Africa

Language
english

Type
pdf

Files
assessment guidlines - foundation phase.pdf
Foundations for Learning Grade R.pdf

Collection
Teachers' Resources

Tags
Foundation Phase

Citation
Department: Education Republic of South Africa, "ASSESSMENT GUIDELINES FOR FOUNDATION PHASE GRADES R - 3," in Computer Aided Language Learning Resources, Item #4, http://call.gravitysa.co.za/omeka/items/show/4 (accessed January 15, 2013).

Figure 5.14 Link to Word file consisting of “Assessment Guidelines for Foundation Phase Grades R-3”

Word Families

All Titles

Word Families

Title
Word Families

Files
EHL 7.05.edited.doc

Collection
Teachers' Resources

Tags
English, Grade 7

Citation
"Word Families," in Computer Aided Language Learning Resources, Item #27, http://call.gravitysa.co.za/omeka/items/show/27 (accessed January 15, 2013).

License

Previous Item Next Item

Item Relations

This item has no relations.

Social Bookmarking

File: EHL 7.05.edited.doc

1 / 5

English Home Language
Resource Name: Word Families
Assessment Exemplar Number: EHL7.5
Item/s: 2
Phase: Senior Phase
Grade: 7
Tags: Pairing, dictionary, worksheet, Formative Assessment
Assessment Type: Formative
Assessment Form/s: Worksheet, Informal
Copyright for included material: N/A
Duration: 1 hour
Learning Outcome(s) and Assessment Standard(s): **Learning Outcome 6: Language Structure and Use** The learner will know and be able to use the sounds, words and grammar of the langu create and interpret texts. **Assessment Standards** We know this when the learner: 6.1 Works with words: • Identifies and uses word families and words of the same field in context to vocabulary in context. • Analyses how languages borrow words from one another, and how new w coined and uses these appropriately.
Learning Space: Assessment
Hyperlinks: To be completed later.
Number of questions for exemplar: 2

Figure 5.15 Link to Word file consisting of "Word Families" assessment exemplar

5.10 Cycle 4: Initial selection

After completion of the previous process was, it was necessary to narrow down the final selection to as few stacks as possible before committing further resources (i.e. time) to adding more content to the stack (see Bacon 2009, 199). The final two stacks selected were Moodle and Omeka. The previous rounds of testing (i.e. by rating, installations and setup) resulted in two stacks being considered viable options, being, Moodle and Omeka. While Omeka was a better product in terms of standards rigour in assigning key words and metadata, Moodle had a larger support base and had a key advantage in terms of ease of use in adding resources by end users. Moreover, Moodle is a strong and flexible learning management system, while Omeka is more suited for use as a more sophisticated repository to which advanced users (such as librarians and information professionals) would be able to contribute.

5.11 Cycle 5: Piloting

Five expert e-Learning users from DUT were asked to look at Omeka and evaluate it. They all commented favourably on the LMS and its clean interface although they were not asked to evaluate it in-depth. However, Moodle was a known stack which had been running for some time at DUT and had an enthusiastic hobbyist following, as well as having been used in some disciplines for academic work(see Pratt, 2013 for its use in research capacity building). A customised version of this LMS had been set up by the researcher in 2009 for a fellow academic. The researcher had also been exposed in an advisory capacity to the DUT hosted Moodle LMS, which has been in operation for approximately ten years (since 2003). It had therefore already been piloted for some time at DUT, besides being well known by the researcher. Moodle was therefore selected as the final stack to be used, based on the findings of the previous cycles. Once it was decided to focus on Moodle and its customisation, it was not piloted with any users, since the focus of the piloting, as mentioned at the start of this section, was to exclude one of the last two applications and not to compare the two (Omeka and Moodle) it was a moot point.

5.12 Cycle 6: Final selection (Moodle VLC-LLOR)

Moodle was selected in view of its fulfilling the detailed specifications of the LLOR (see 5.5 Detailed specifications of the LLOR) and some of the key factors are discussed in more detail below:

5.12.1 Mutability

One of the most significant attributes of the Moodle stack in comparison to the others was that of its mutability, SCORM is as mentioned in Chapter 2 a standard which ensures that content can be easily moved between either the same or different web applications. This increases the *access* that users with limited internet access could otherwise have, as, along with the support for SCORM, Moodle has functionality that enables one to create an offline self-packaged version with all of its included content. In the event that a user has no - or limited - Internet access, they can still benefit from using an offline version, by getting a copy of the course and unpacking it on their computer.

5.12.2 Learning management features

Some of the features that are also common in other LMSs are shown below:

- Authentication, using LDAP, Shibboleth and other standard methods
- Enrolment, using IMS Enterprise.
- Quizzes and quiz questions, allowing import/export in different formats. GIFT (Moodle's own format), IMS, QTI, XML and XHTML. Moodle provides various types of questions - Calculated, Description, Essay, Matching, Embedded Answers, Multiple Choice, Short Answer, Numerical, Random Short-Answer Matching, True/False.
- Resources using IMS Content Packaging, SCORM, AICC (CBT) and LAMS.
- Syndication, using RSS or Atom newsfeeds – external newsfeeds can be displayed in a course, and forums, blogs and other features can be made available to others as newsfeeds.

5.12.3 Branding CALL-KZN

Branding as mentioned previously was considered an essential aspect of the theming of the CALL-VLC and the theming started with the design of a logo. As the target user-group chosen was from KwaZulu-Natal (a province in South Africa), the name “CALL-KZN” was coined, in order to emphasise the geographical context the background of a map (using the continent of Africa as the focus) was used and to further highlight “literacy” as a major focus of the LLOR, an open book was embedded in the logo. Theming involved the conceptualisation of the logo, its development, customisation of a Moodle theme to include the logo, and fine-tuning the theme to ensure that it functioned optimally after modification. This included testing in different contexts (i.e. user roles) such as with guest, or authenticated user roles. This completed the process of meeting the detailed specifications and subsequent “branding” phase in the development of the CALL-KZN VLC. The CALL-KZN homepage is shown in Figure 5.16.

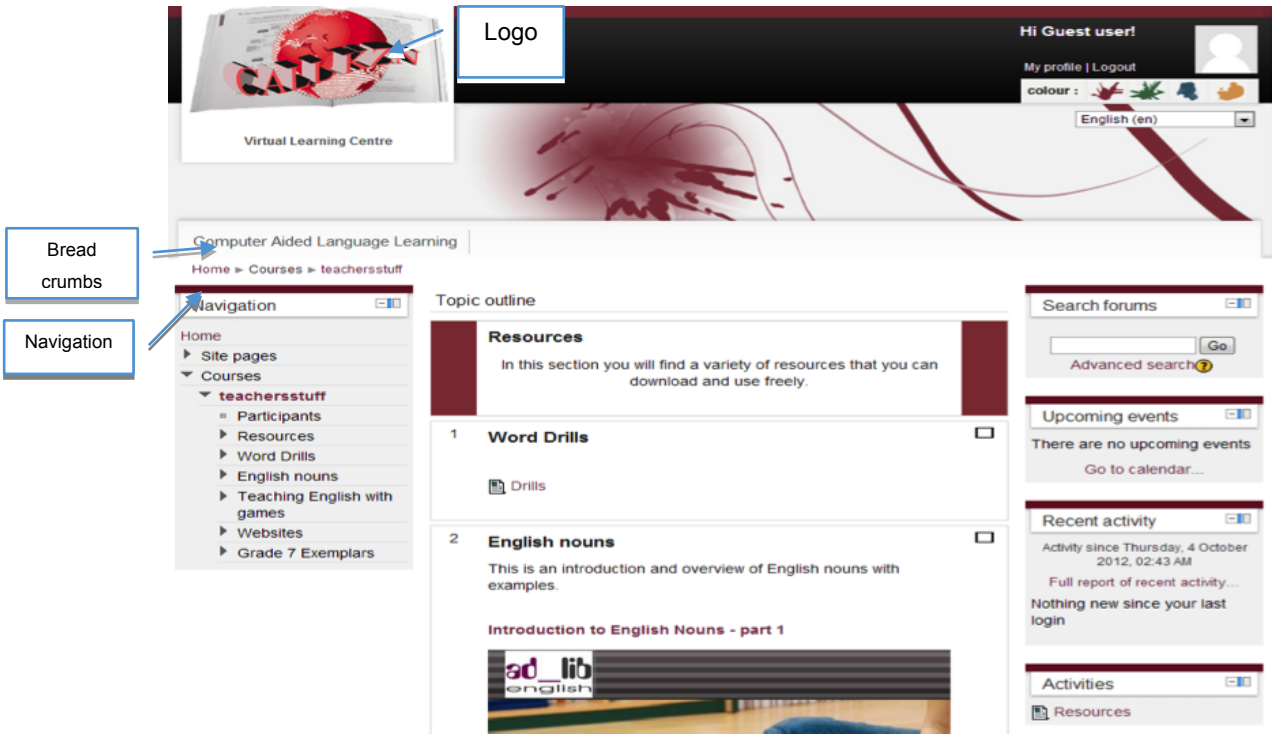


Figure 5.16 Homepage of prototype: CALL-KZN Virtual Learning Centre

5.13 Conclusion

Moodle was the final selection for the VLC-LLOR in view of its fulfilling the detailed specifications of the artefact (see 5.5) and the factors shown in 5.7. Morever the groundswell of interest from the educational sector in using Moodle makes its continued support and development more likely. The next chapter deals with usability testing and end user feedback, some of which took place during the sections process described in Chapter 5, but will be dealt with in Chapter 6 for ease of reference.

Chapter 6: Artefact Testing

6.1 Introduction

This chapter deals with artefact testing of the LLOR to fulfil objective 3. (to test out the operation of the LOR in terms of teacher and learner access to language learning resources) and 4. (to obtain responses from users in terms of its potential for facilitating language learning in schools in KwaZulu-Natal). This chapter evaluates the artefact in terms of its usability by analysing data obtained from two different sectors: firstly, quantitative data obtained from academic support staff with some experience in digital learning and related technology; secondly, qualitative data obtained from educators (i.e. the intended end user group). End user feedback was obtained from various role-players, including educators at subject advisor and teacher training level, as well as those working in schools.

6.2 Usability analysis

Usability (or user-based) testing was used after the first LLOR prototype was produced to observe how actual users fared when introduced to the CALL-VLC. Bacon defines user-based testing as follows:

> This is a user-centred design method that helps evaluate software by having real people use it and provide feedback. By simply sitting a few people in front of your software and having them try it out, usability testing can provide valuable feedback for a design before too much is invested in coding a bad solution (2009: 199).

According to Bacon's(2009) user-centred design method, various consultations are done between the developer and the target audience, and prototyping is used to determine the rough design of the application (the LLOR in this case), and following a process of consultations via needs analysis, a picture is painted of how users are interacting with the application. Usability testing can be used early on the design process so as to observe usage patterns: "the most obvious is that it gets us feedback from a lot of real users, all doing the same thing"

(Bacon, 2009:199) and to avoid investing too much in the way of resources in a product which does not work as envisaged.

Three categories of users were invited to test-drive CALL-VLC and to then complete a web-based online survey that comprised two sections; the first related to the respondents' computer and internet experience and the second on their evaluation of the CALL-VLC. E-learning experts (i.e. EdTech staff), academics (i.e. lecturers) and educators (i.e. school teachers) represented by eight respondents participated in the survey. The purpose of asking respondents about their computer experience was to test the hypothesis, that user-contributors are more likely to be experienced computer users then in-experienced. The two sections were mutually exclusive, no expectation was made that experienced computer/internet users would be better at rating the usability of the CALL-VLC.

All participants were invited to try out the LLOR from their Internet enabled computers in various locations (such as their offices, or from their homes). Each group was asked to complete a web-based survey (deployed with LimeSurvey) to establish trends in participants" reactions to using the LLOR in terms of its anticipated use for language learning as well as ease of use (usability study).

6.3 The survey

The survey was piloted before being carried out.

6.3.1 Piloting the survey

An initial web-based survey (see Appendix A) was used to pilot the survey in order to determine how accessible the survey questions were and to identify any problems with expression, the relevancy of the queries and the links to the various subsections. The latter was needed as branching logic was used in questions with multiple answers: each branch had to be checked to ensure that the logic was maintained (for example, in some questions answers would divert users either to "no further questions" or to an additional set of questions).

6.3.2 The actual survey

The survey was divided into two sections, the first section being to establish the users' educational background and their familiarity with computers. This was because one of the planned outcomes of the design of the LLOR was that users would adopt the Web 2.0 bent where there is a communal (kibbutz) approach to the development of public facing web content, and therefore it was hypothesised that elements of their educational background would indicate the likelihood of this panning out once the CALL-VLC was opened to the public.

In the experience of the researcher, experience[12], followed by 2 years as technical end-user support in e-Learning and the last 5 as the Learning Management Systems Administrator; computer familiarity is a significant factor in determining the propensity of a potential contributor to contribute. Profiling the respondent pool played a critical role in testing one of the assumptions made in this study, namely that users, if competent enough and motivated enough, would be in a position to add to the LLOR with relative ease.

6.4 Users' background data

This section established the users' educational background and familiarity with computers by gathering data on the following:

- Demographic of survey population
- Computer experience
- Browser familiarity
- Familiarity with user-contributed web apps
- Users' rating of social apps
- Respondents' search engine preference

The data collected for each of the above will be presented with the use of graphs showing the various figures obtained.

[12]Technikon Natal: a higher educational tertiary institution that was merged in 2003 into the present Durban University of Technology, in Durban, South Africa.

6.4.1 Demographic of survey population

There were sixteen persons selected for this survey as mentioned previously from the following categories: Post-secondary student, Teacher at school, Lecturer at HEI, and Senior Education Specialist at DOBE.

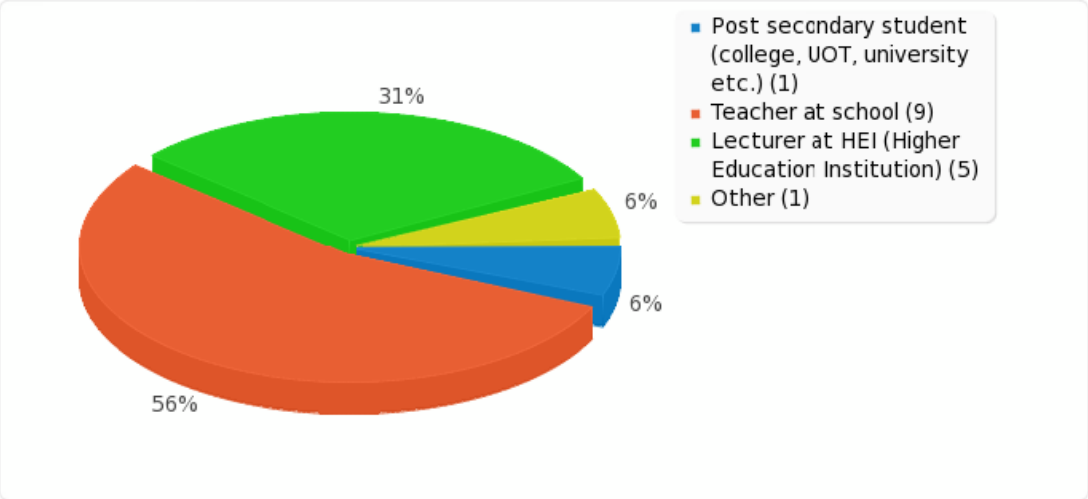


Figure 6.1 Respondents by category

As shown in Figure 6.1, as well as in associated Table 6.1, 56.25% (i.e. over half of the respondents) were from the category school teachers, followed by e-Learning experts (31.25%). Respondents also included one Post- Secondary Student and one Senior Education Specialist. This is because while the LLOR was designed mainly for teachers, other educator feedback was sought.

Table 6.1 Respondent categories: count and percentage

Answer	Count	Percentage
Primary school student (SA1)	0	0.00%
High school student (SA2)	0	0.00%
Post secondary student (college, UOT, university etc.) (SA3)	1	6.25%
Teacher at school (SA4)	9	56.25%
Lecturer at HEI (Higher Education Institution) (SA5)	5	31.25%
Other	1	6.25%
No answer	0	0.00%
Not completed or Not displayed	0	0.00%

6.4.2 Computer experience

Figure 6.2 and Table 6.2 are indicative of teachers' perception of the lack of attention given to their up-skilling, especially with respect to improving their computer literacy (as mentioned in Chapters 1 and 2). However, according to the Subject Specialist (RR), legislature intended to address this problem has already been passed into law. Most of the respondents (87.5%) indicated a high level of computer experience. However there was one respondent who admitted to a low level of computer experience.

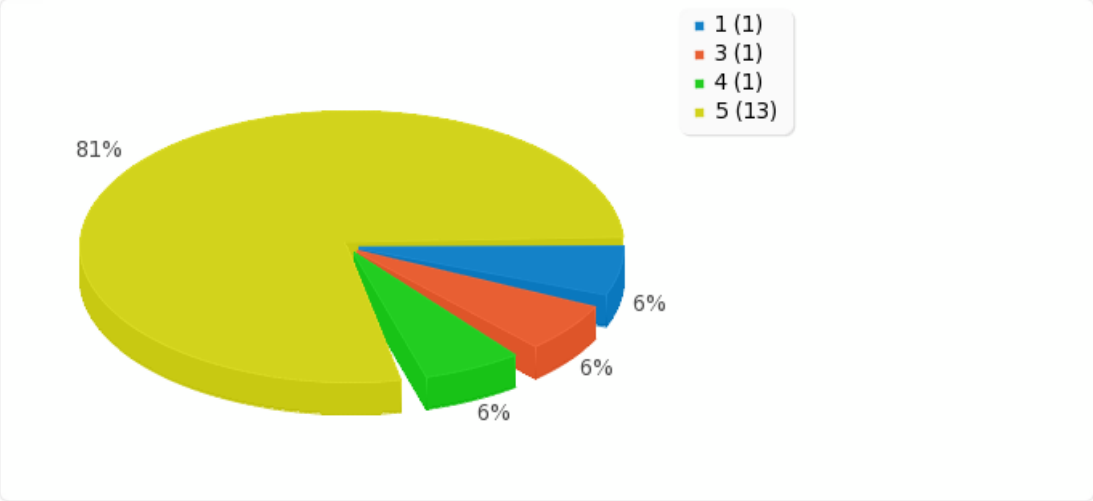


Figure 6.2 Computer experience

Table 6.2 Computer experience summary by count and percentage

Answer	Count	Percentage	Sum
1 (1)	1	6.25%	6.25%
2 (2)	0	0.00%	
3 (3)	1	6.25%	6.25%
4 (4)	1	6.25%	
5 (5)	13	81.25%	87.50%
No answer	0	0.00%	
Not completed or Not displayed	0	0.00%	
Arithmetic mean	4.56		
Standard deviation	1.09		
Sum (Answers)	16	100.00%	100.00%
Number of cases	16	100.00%	

6.4.3 Browser familiarity

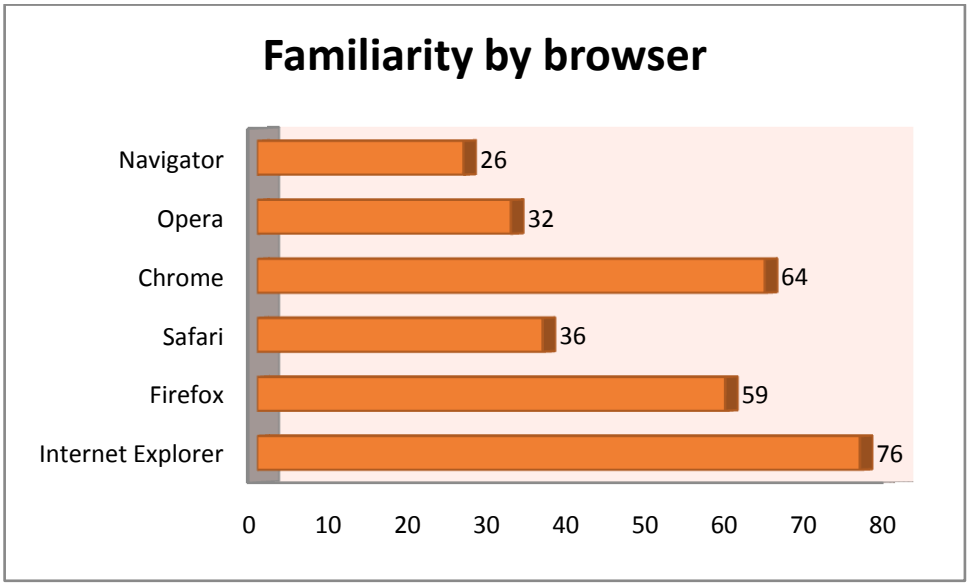


Figure 6.3 Browser familiarity

Respondents were asked to rate their familiarity with the most popular browsers, using the scale of 1 for “most unfamiliar” to 5 for “most familiar”. The data in Figure 6.3 indicates that Internet Explorer, Firefox and Chrome were the most popularly used browsers. In terms of cross-browser compatibility, the CALL-VLC (Moodle based) works well with these browsers.

6.4.4 Familiarity with user-contributed web apps

The CALL-VLC was specifically designed and conceptualised as an application reliant on the contributions of users (similar in operation to WikiPedia). However, unlike WikiPedia (funded by the William and Flora Hewlett Foundation) or ESAACH (which had a substantial contribution of entries emanating from another research project), this application will require most of its content to be generated by its users, albeit guided by the researcher. Respondents were asked to indicate their familiarity with a selection of Web 2.0 applications which allow user-contributions; then, using branching logic, the survey asked how they had interacted with each of the respective applications.

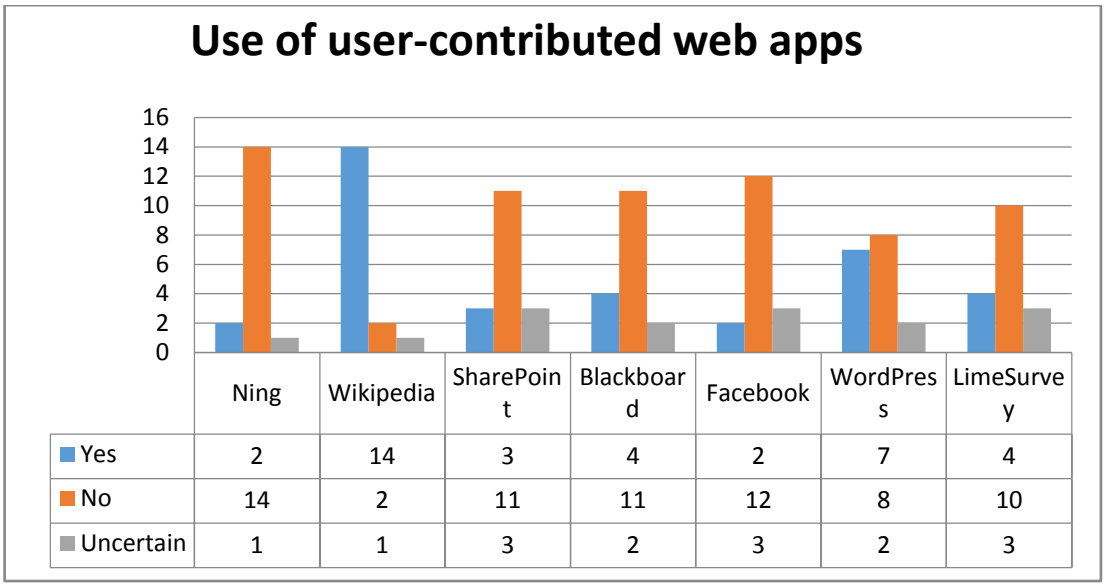


Figure 6.4 User contributed web apps

As shown in Figure 6.4, most of the respondents indicated that they had used the applications, with WikiPedia, and WordPress being used by 14 and 7 respondents respectively. Ning was marketed as a social collaboration tool for educator's but only two respondents had used it. SharePoint and Blackboard are enterprise-level, access-controlled web applications, which only respondents 3 and 4 had actually used. Predictably, then, 11 respondents indicated that they had not used it, as they had not had access to it in their schools. LimeSurvey was the tool used to deploy the survey, but the respondents did not realise they had used it to answer the survey questions, as 10 indicated that they had not used it, 3 were uncertain and only 4 knew that they had used it. WordPress may have been used, but it is possible that it was a customised version that was not distinguishable as WordPress, except in the case of very experienced computer users. There was a split in the answers, with 7 indicating they had used WordPress, and 8 answering in the negative.

6.4.5 Users' rating of social apps

Participants were asked to rate each of five popular social networking sites on a scale of 1-5 in terms of regular usage. As shown in Figure 6.5, Facebook and Twitter were the sites which most participants said they visited the most

frequently. This confirms, as might be expected, that these are some of the most popular social networking sites.

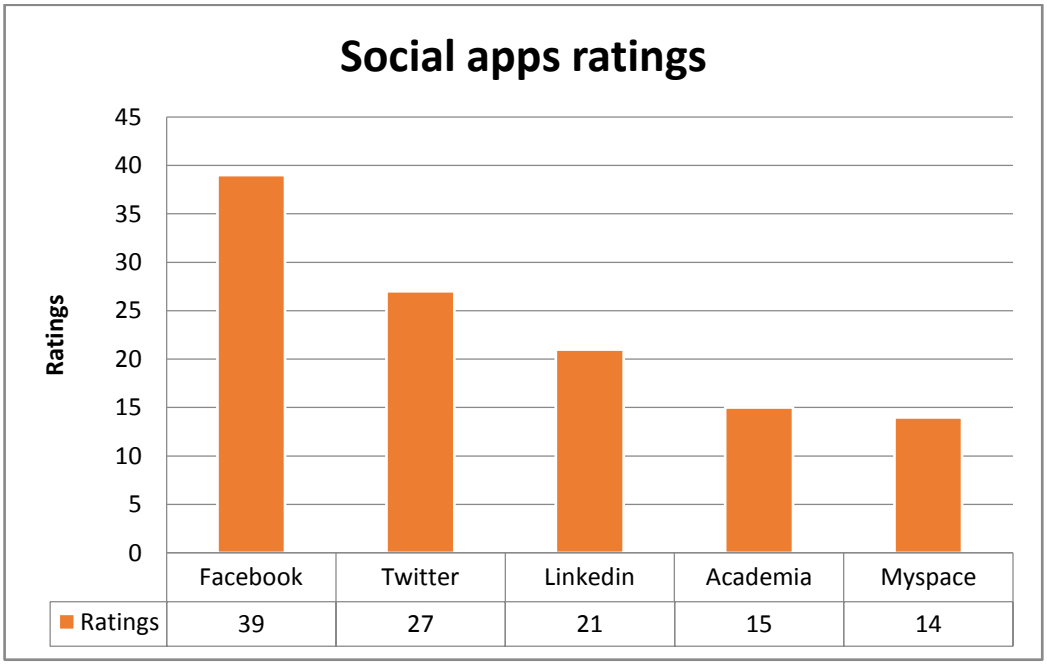


Figure 6.5 Social apps ratings

LinkedIn and Academia are considered professional networking tools, and, as expected, these were fairly frequently used by the respondents. There was an indication that MySpace was also used, albeit not as frequently as its main competitor, Facebook, which is supported by market share statistics (Quinn & Gardner-Madras, 2010). Respondents were asked to indicate if they had used the previously mentioned CMSs as Contributors, Editor, or Viewer.

6.4.6 Respondents' search engine preference

This question was intended to ascertain the search preferences of the different respondents. Users are fickle when it comes to the use of Internet tools such as search engines, but what is apparent is that Google was the most used search engine (17 respondents). 10 respondents chose Yahoo as their search engine and the rest, 3 (Bing), 1 (Ananzi) and 1 chose another search engine/browser, Torch, which was not known to the researcher. The respondent who indicated Torch as the tool of choice was a young teacher, and

this makes sense since younger generation users are more likely to adopt new technologies then older generation users who are more set in their ways.

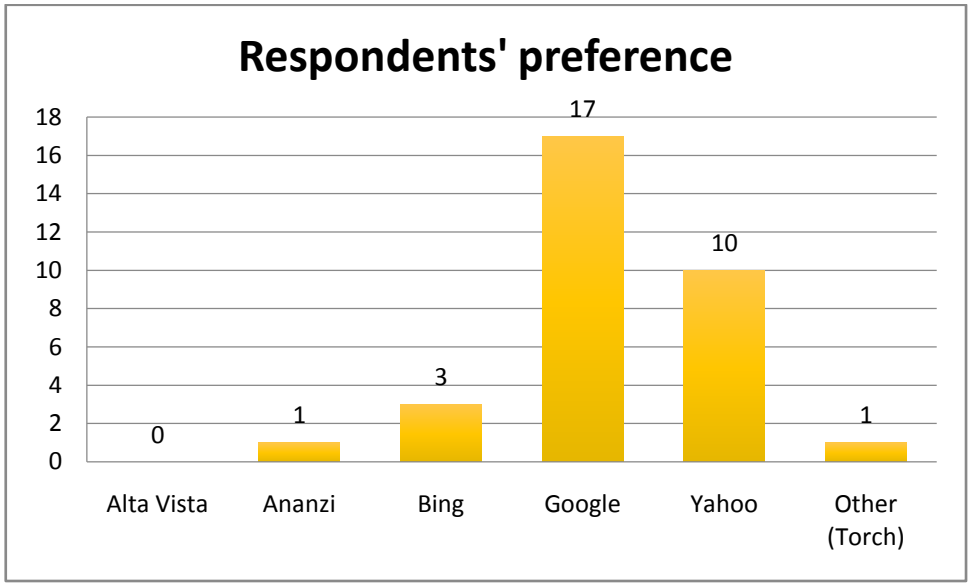


Figure 6.6 Search engine preference

The most popular web browsers emerged as the most highly rated by the survey population and the CALL-VLC works well with all those, which is a positive finding. Developing a user-contributed model of LLOR suggests that its success is linked to having user contributions (mainly). However, this aspect was not supported by the responses, since few of the respondents indicated that they have contributed to any of the web apps mentioned (see Figure 6.6).

6.4.7 Summary of data on users' background

As can be seen from the above, attributes of the users' profiles included: demographic of survey population, computer experience, browser familiarity, familiarity with Web 2.0, and users' rating of social apps. The demographic was chosen using purposive sampling, and was therefore justified in terms of the categories and numbers of users. Most of the respondents (87.5%), had a high level of computer literacy. The users' ratings of browsers placed Internet Explorer first then Mozilla Firefox followed by Chrome in terms of popularity. WikiPedia followed by WordPress were rated as the most familiar Web 2.0 web

apps, Ning followed by Facebook, SharePoint, Blackboard and LimeSurvey were considered the most unfamiliar Web 2.0 web apps. This made sense since Blackboard and SharePoint are not commonly available to most users. Facebook was the highest rated social app followed by Twitter and Linkedin.

6.5 Usability of the CALL-VLC

The usability of the LLOR is critical to its success, and, since teachers appear to lack access to skills development such as computer literacy, it was considered important to develop a user-friendly interface for the LLOR.

- Navigation: going forward
- Navigation: finding an item
- Navigation: locating a category
- Navigation: locating a resource
- Navigation: locating by browsing
- Downloading an item
- Overall navigation

6.5.1 Navigation: going forward

As shown in Figure 6.7, 7 (i.e. out of 16) users agreed that the LLOR was “very easy” to use, whilst 9 considered “going forward” (i.e. in navigation) either “very difficult” or “difficult” to move forward in. In the middle range, there were 4 users who indicated that it was moderately easy to move forward through the website. These results should be used as one point of consideration for the design of future versions of the LLOR, but there is also the option of training for use.

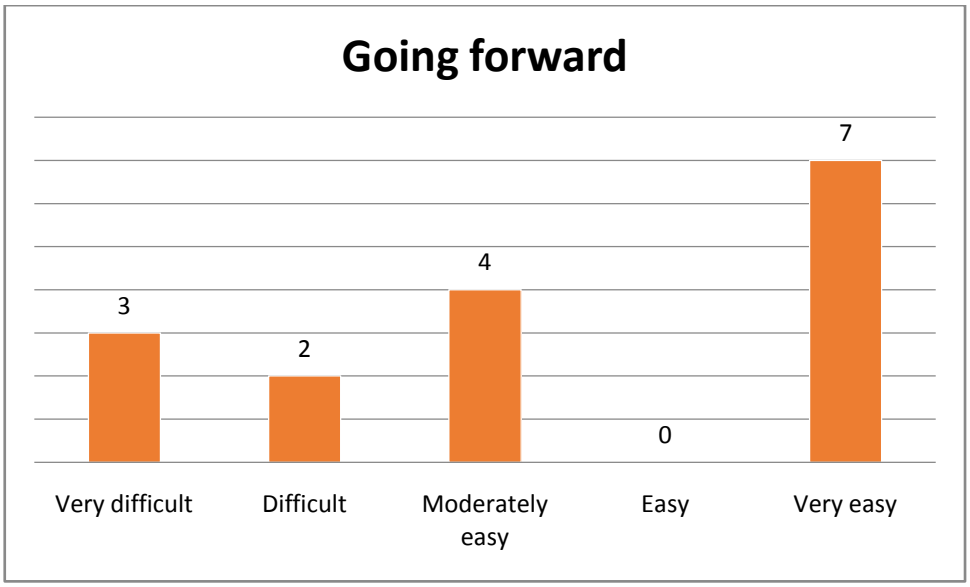


Figure 6.7 Navigation: going forward

6.5.2 Navigation: finding an item

Users were not asked to locate any specific item but instead asked to browse the LLOR and rate "finding an item". The results (in Figure 6.8) show that half the users (5 from "Very easy" and 3 from "Easy") found that it was relatively easy to find an item, whilst 3 found this task "Moderately easy". Less than half the users (2 from "Very difficult" and 3 from "Difficult") found it difficult.

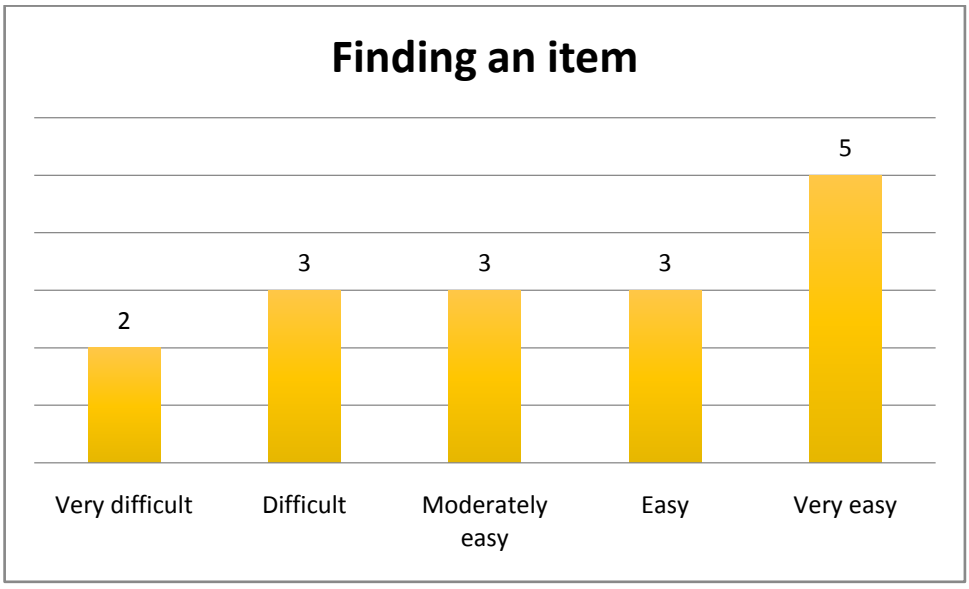


Figure 6.8 Navigation: finding an item

6.5.3 Navigation: locating a category

The LLOR employed a categorical classification system which was intended to promote ease of use. Figure 6.9 suggests that “locating a category” was a easy to relatively task, according to 11 users. There was an indication from 5 users (3 from “Very difficult” and 2 from “Difficult”) that it was relatively difficult to locate a category. It is not conclusive, therefore, as to whether this task is overall “easy” or “difficult”.

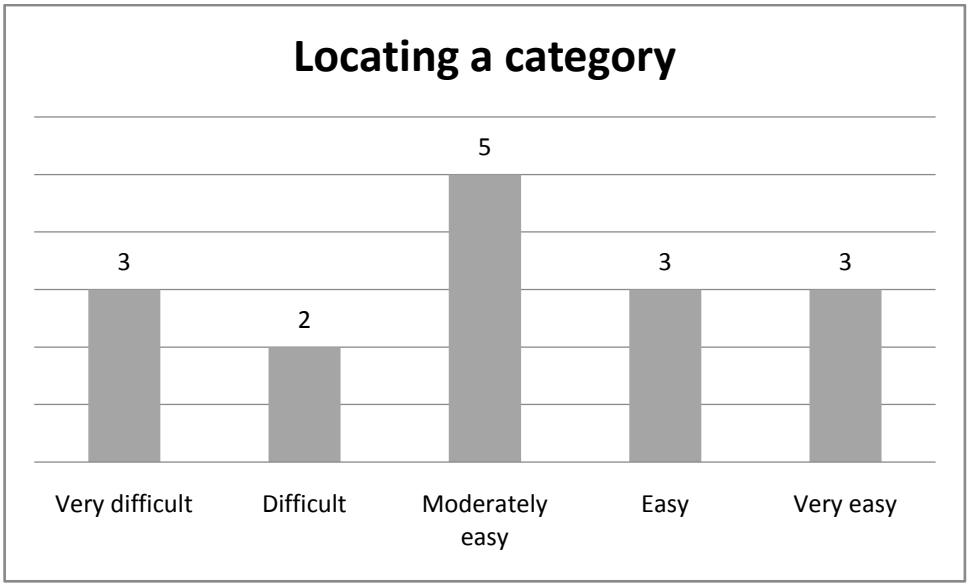


Figure 6.9 Navigation: locating a category

6.5.4 Navigation: locating a resource

There are multiple ways in which a resource can be located, and this includes browsing by category, or in this case, by resource type. Figure 6.10 shows that resources such as a file (e.g. word, pdf, media file or executable file) were considered relatively easy to find (11 users out of 16); by contrast, less than a third (5 users) rated it as difficult to locate a resource. There were 4 who indicated that it was “Moderately easy” to complete this task. The results are not indicative of any overwhelming predisposition; in fact it would suggest that further testing should be done to identify a trend.

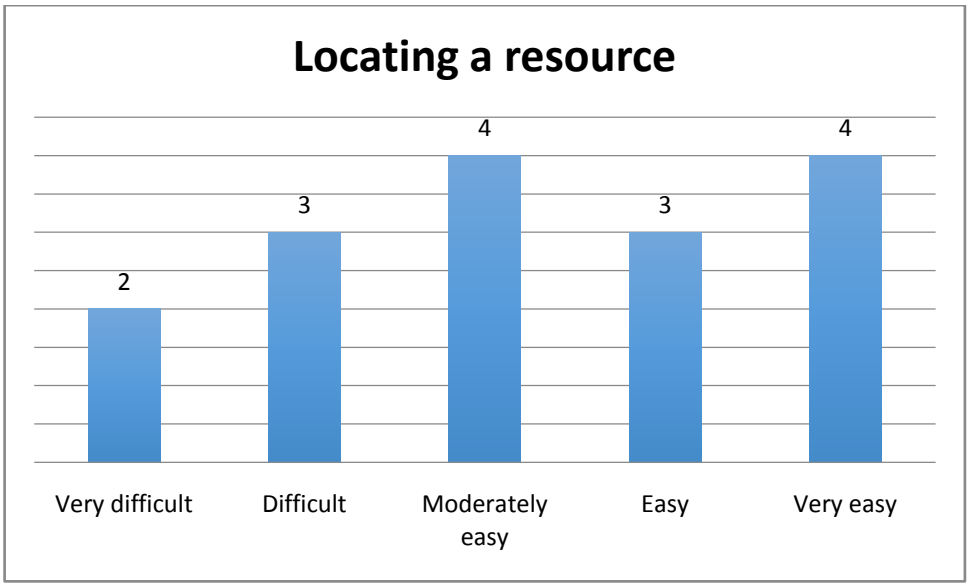


Figure 6.10 Navigation: locating a resource

6.5.5 Navigation: locating by browsing

Respondents were asked about their navigation experience of "locating by browsing", and Figure 6.10 shows that most rated this positively, ranging from "Moderately easy", to "Very easy", (11 out of 16) whilst (5 out of 16) rated this from "Very difficult" to "Difficult". On average this indicates that "locating by browsing" posed few challenges, taking into account the differences in users' computer experience and expertise.

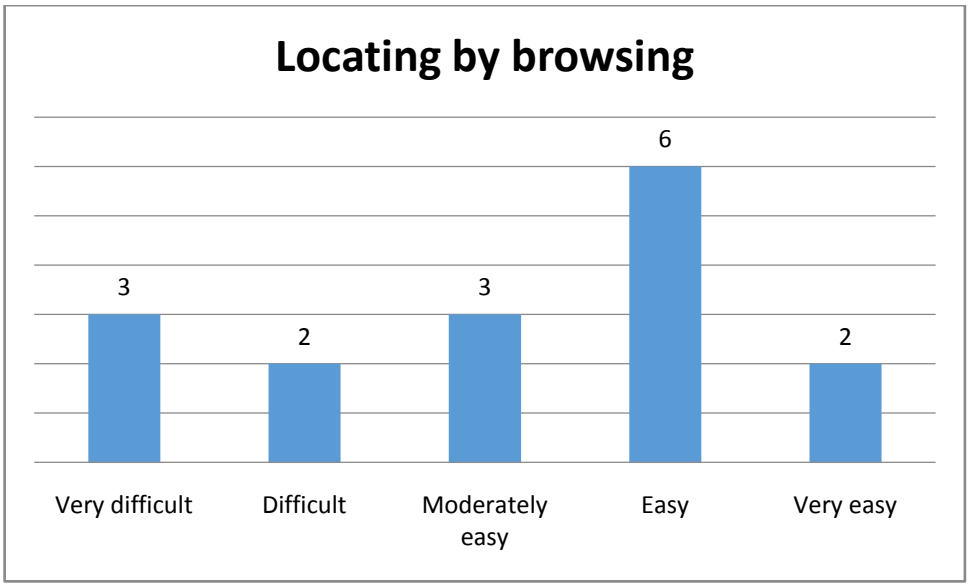


Figure 6.11 Navigation: locating by browsing

6.5.6 Downloading an item

The respondents were mainly positive about the task of “downloading an item”. Figure 6.12 shows that 11 out of 16 rated it relatively easy. However, 5 out of 16 rated this from “Very difficult” to “Difficult”. This can be attributed to users with lack of multiple browser experience, as there are variations in downloads on each browser.

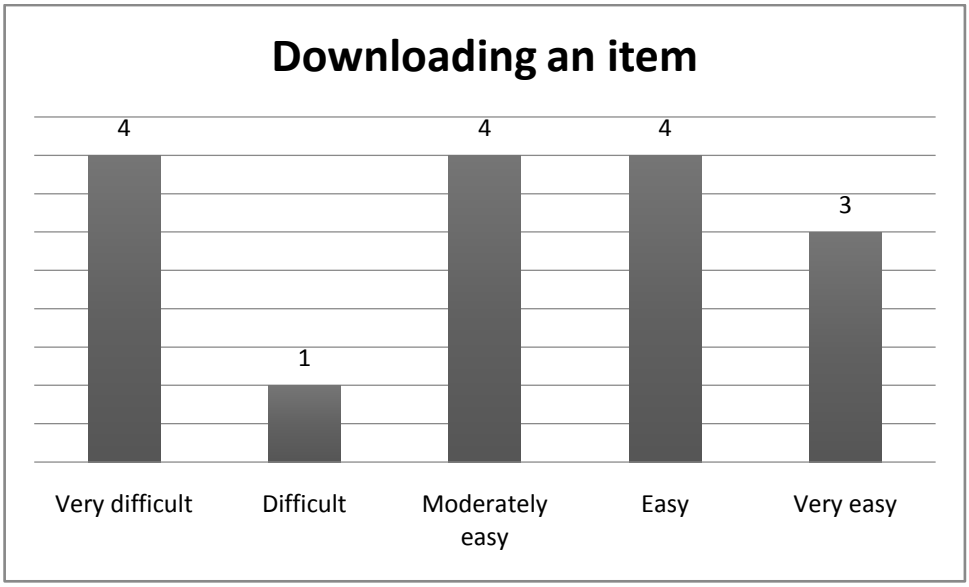


Figure 6.12 Downloading an item

6.5.7 Overall navigation

Respondents were asked about their navigation experience of “locating by browsing”, and Figure 6.13 show that most rated this positively, ranging from “Moderately easy”, to “Very easy”, (11 out of 16) whilst (5 out of 16) rated this from “Very difficult” to “Difficult”. On average this indicates that “locating by browsing” posed few challenges, taking into account the differences in users’ computer experience and expertise.

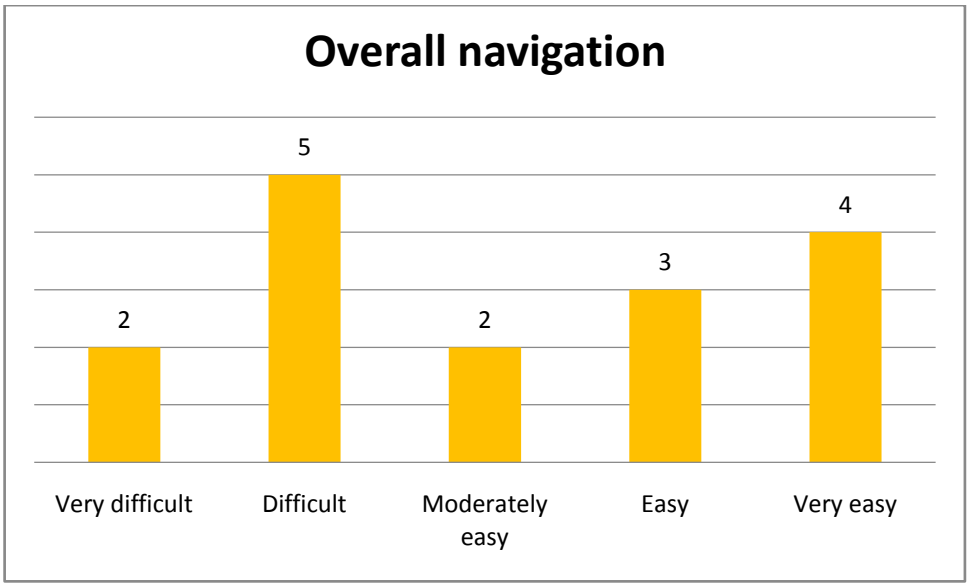


Figure 6.13 Overall navigation

Overall navigation included the experience the user had from entering the website until exiting, and comprised all the following individual tasks: “Going forward”, “Finding an item”, “Locating a category, “Locating a resource”, “Locating by browsing” and “Downloading an item”. The results shown in Figure 6.13 suggest that the users are split fairly evenly between those who had difficulties and those who did not, with a small margin being undecided (7 out of 16) indicating that it was “Easy” to “Very easy”, and the same number 7 choosing “Very difficult” to “Difficult”, with 2 choosing “Moderately easy” as their rating).

6.5.8 Summary of usability data

Navigation is a key aspect of HCI, and usability testing focused mainly on ease of the navigation throughout the process of using the artefact. In terms of relative ease of navigation, the responses support the efforts of the researcher to develop an intuitive navigational system (this made easier since it uses Moodle’s tried and tested functionality as its basis). However, efforts to improve categorisation and organisation should be on-going as the LLOR should morph/adapt in response to (user) feedback and the corresponding (web) innovations.

6.6 Rating of the CALL-VLC content

Although this section is moving in the direction of user feedback, it was part of the survey, and is included in the usability testing section, as the LLOR's usability could not have been tested without suitable teaching/learning content. As mentioned previously, the content appearing in the CALL-VLC was not intended to be exhaustive, but rather to be used as "sample content" that could tested by the survey population. However, the content had to be selected in terms of its suitability and contextual value in a specific geographical location, namely (South Africa) and specifically KwaZulu-Natal (a province of South Africa). The resources rated by the respondents ranged from two South African resources (Thutong and SABC Education) two United Kingdom sites (BBC and OPEN University) and international sites (Internet Archive and Slimekids). However, all of these support the South African dialect. There was a dual purpose in asking respondents to rate the potential of these resources, one to get their opinions about it, and the second was to draw their attention it has a potential resource that they could use in the future. The overall responses support the researcher's choice of content and augur well for future operation of the LLOR.

The items were all on weblinks running off the CALL-VLC site, as follows:

- Thuthong
- Internet Archive
- BBC
- ABC Education
- OPEN University
- SlimeKids

6.6.1 Rating of Thutong

According to 8 respondents the Thutong website was relatively useful, 6 rated it "Moderately useful" and only 3 found it "Not useful" (see Figure 6.14). This website is the officially run Department of Basic Education teacher and student resource centre/portal. It is encouraging that the teachers were aware of its existence and rated it as useful.

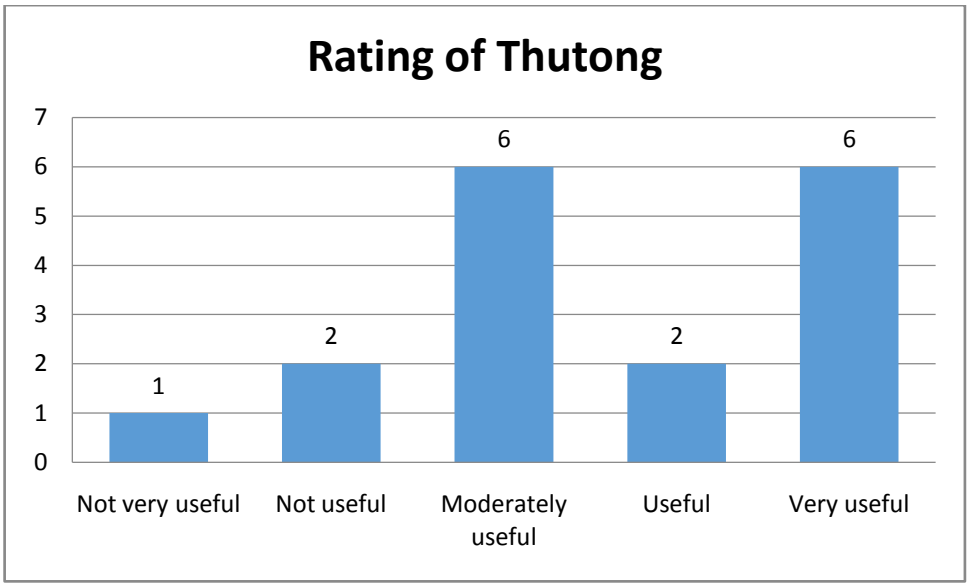


Figure 6.14 Rating of Thuthong

6.6.2 Rating of Internet Archive

Figure 6.15 depicts the Internet Archive which is described as a “digital library of Internet sites”, and whilst its comprehensiveness is potentially complicating for novice users, its value is in the variety comprising the collection. Respondents in the main rated this as either “Useful” to “Very useful”, only 2 rated it as “Not useful” and 4 rated it as “Moderately useful”. Overall the responses indicated that the Internet Archive was considered useful.

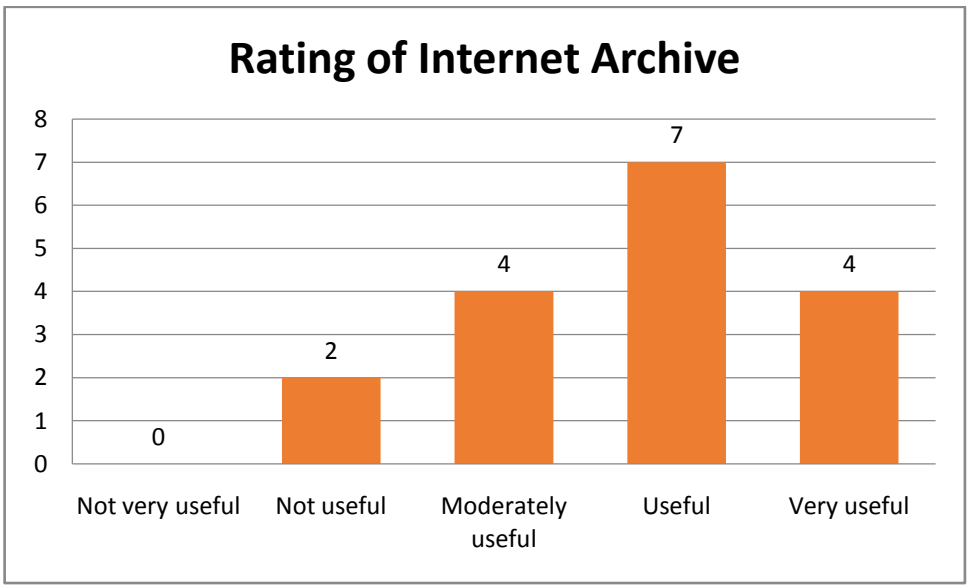


Figure 6.15 Rating of Internet Archive

6.6.3 Rating of BBC

The BBC website has content that is suitable for the South African context, as Figure 6.16 shows. 13 respondents (4 from “Moderately useful”, 6 from “Useful” and 3 “Very useful”) were positive in their ratings. There were some who rated it negatively in that 1 rated it “Not very useful” and 3 “Not useful”.

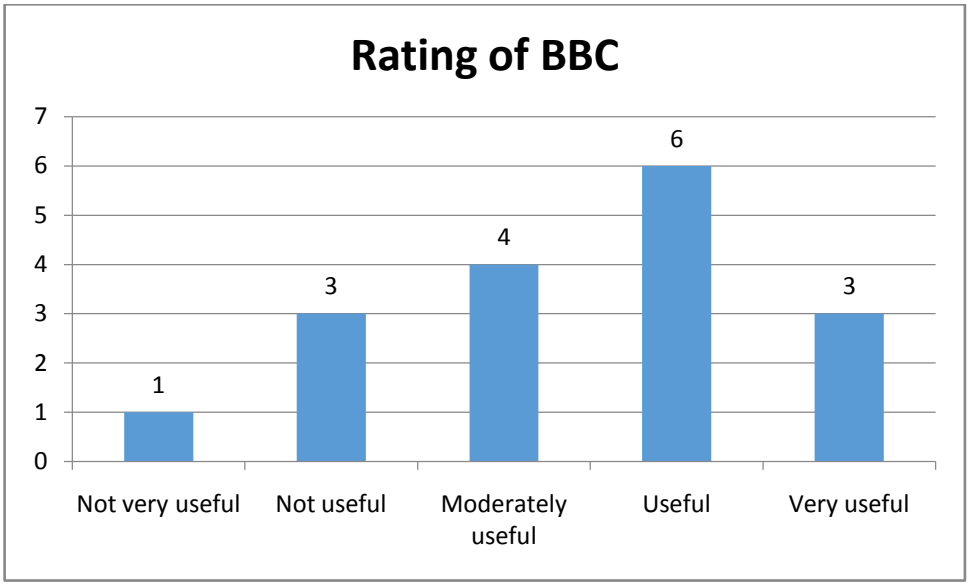


Figure 6.16 Rating of BBC

6.6.4 Rating of SABC Education

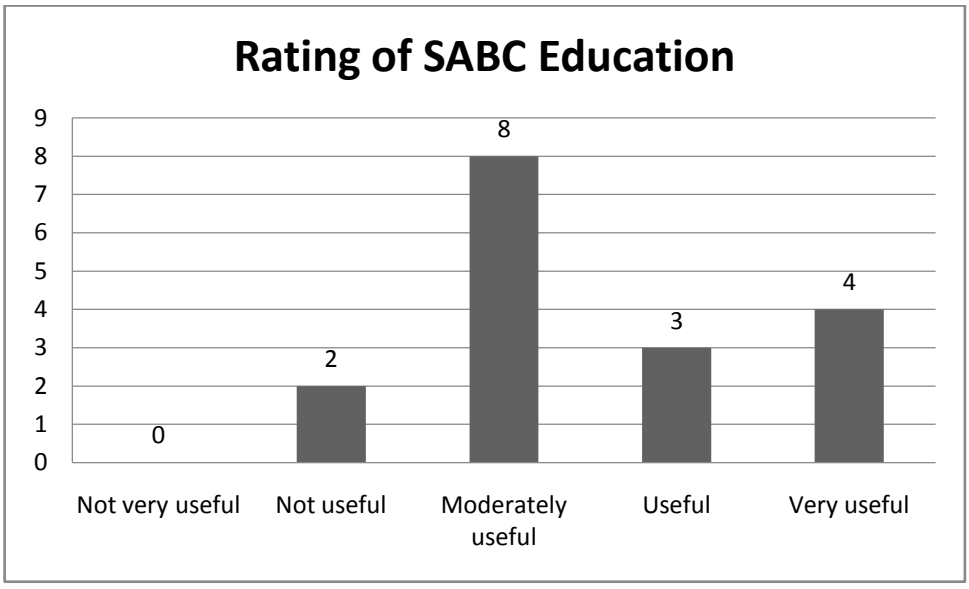


Figure 6.17 Rating of SABC Education

Respondents were mainly positive when rating the SABC Education website, and as shown in Figure 6.17 since 15 rated it useful (3 from “Useful”, 4 from “Very useful” and 8 from “Moderately useful”) and only 2 rated it “Not useful”.

6.6.5 Rating of Open University

Figure 6.18 displays the respondents rating of the Open University, which is suited to the South African context, 10 responses were positive (5 from “Useful” and 5 from “Very useful”) 5 indicated that it was “Moderately useful”, and 2 considered it relatively not useful (1 “Not very useful” and 1 “Not useful”). There is an overall positive rating of this resource which supports the selection of it by the researcher.

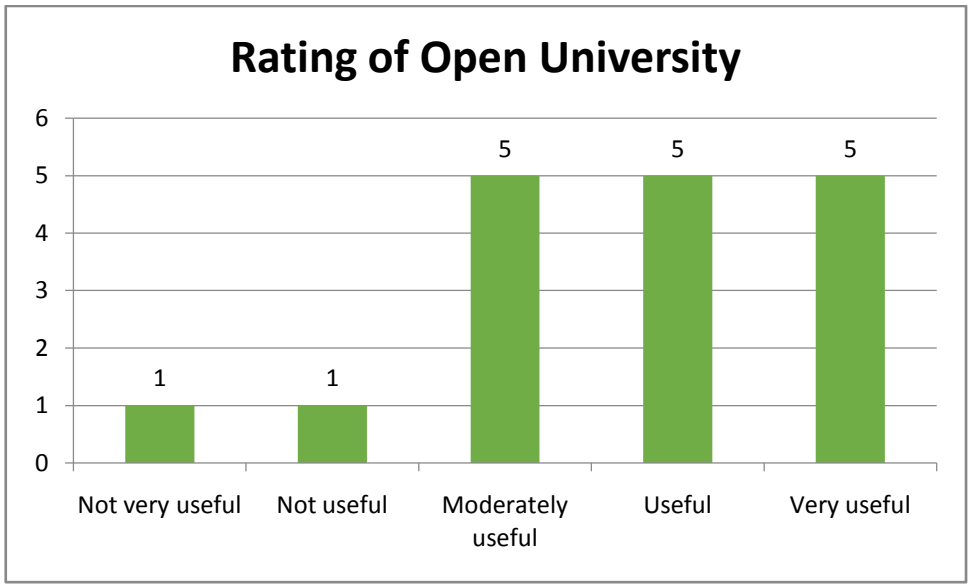


Figure 6.18 Rating of Open University

6.6.6 Rating of SlimeKids

SlimeKids is a very useful resource which comprises numerous word games, which is why it was targeted for typical learners by the researcher. The results shown in Figure 6.19 support the researcher’s choice of SlimeKids as a potentially useful resource, since 6 respondents rated it positively (3 “Useful” and 3 from “Very useful”), 5 rated it “Moderately useful”, and, in contrast, only 6 rated it negatively (4 “Not very useful” and 2 “Not useful”). Overall, there was a

positive assessment of SlimeKids which indicates that it is a potentially useful resource, according to the teachers who reviewed it.

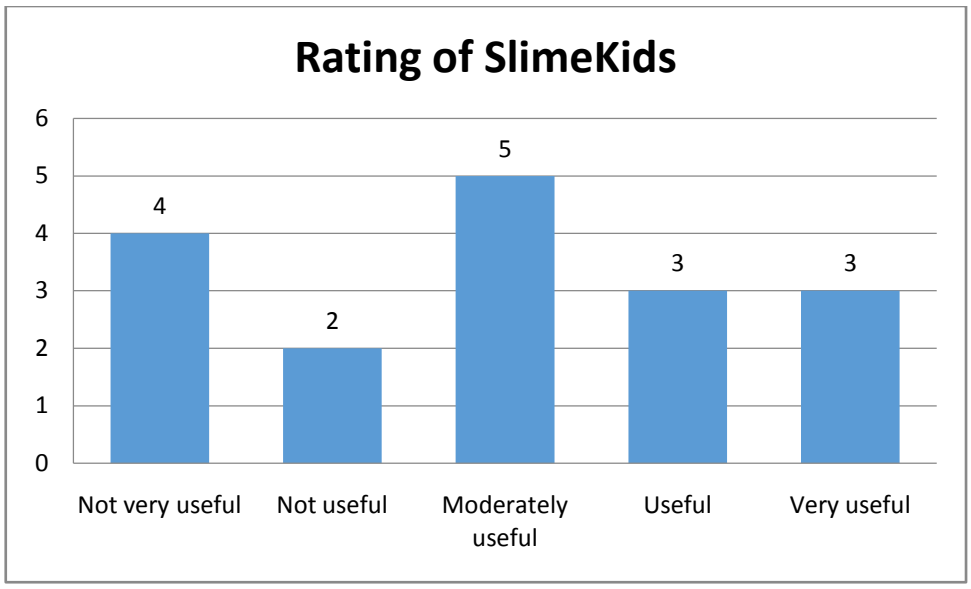


Figure 6.19 Rating of SlimeKids

6.7 Feedback from a sample end user group

Table 6.3 gives an overview of the responses obtained from the sample end user group in terms of the potential of the LLOR for use as a language learning/teaching resource in schools. While the response was predominantly positive, some of the "yes" answers were qualified (indicated by shading). This will be better understood when the reasons given for the responses are discussed below.

6.7.1 Acceptability of the concept of the LLOR to teachers

Q.1 Is the concept - or idea - of a "language learning object repository" acceptable to you (i.e. teachers)? Why/why not?

Table 6.3 Overview of responses to the CALL-VLC

	Help desk developer	Ex-Teacher/ EdTech staff	Teacher	Teacher	School management	Teacher training	Snr Ed. Specialist from DOE
QUESTIONS	**PN**	**GM**	**RE**	**TM**	**JN**	**AM**	**RR**
Is the concept - or idea - of a "language learning object repository" acceptable to you?	Yes	Yes	Yes	NS	Yes	Yes	Yes
In your opinion, is it easy to use?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Does it fit with your (or your colleagues") idea of language teaching/learning?	Yes	Yes	m/b	No	Yes	Yes	n/a
Do you think it will be successful and catch on?	Yes	Yes	m/b	No	Yes	Yes	Yes
Would teachers (or their colleagues) use it now?	Yes	Yes	Yes	No	Yes	Yes	Yes

The Help Desk person and the ex-teacher, who is now an EdTech member, comment on what they see as the positive side of the LLOR in terms of more exposure to Internet resources, and the convenience and ease of access to Internet sources (advantages often used by EdTech staff to persuade DUT lecturers of the advantages of using e-learning):

> PN: Yes, as a teacher it broadens my teaching ability, and exposes me to current content.

> GM: The concept of a language learning object repository is acceptable to me as it is:
>
> - Easy to gain access to given online connectivity
> - Easy to share with students (again given online connectivity)
> - Easy to monitor usage and popularity of the object repository

The two teachers "at the chalk face" have differences of opinion, however, about the acceptability of the concept of a LLOR:

> RE: Yes, the concept of using technology to facilitate teaching is a good idea.
>
> TM: Whilst I like the whole idea the problem that I have is that we have a few old computers, and very little reliable Internet connection. Also many of us don't have advanced computer skills and find that the use of computers as teaching tools an area that we still need to explore.

RE is positive about acceptance of the LLOR, while TM has reservations. Firstly, his school is not well resourced in terms of equipment and ICT skilled teaching staff, which could be the case in the majority of schools in KZN. Next, teachers at his school do not have sufficient computer training. He also makes the point later that *learners* are very familiar with using computers, and it is the case at DUT that many of our undergraduate *students* are more familiar with computers and the Internet than lecturers: it is in fact the middle-aged to older-level staff who are apprehensive about using e-Learning as it may show up their inadequacies to students. As much teaching at schools and universities is still the traditional model of authoritarian, top-down knowledge transmission, lack of computer-savvy when introducing e-Learning might be seen as eroding the instructor's authority, leading not only to feelings of inadequacy but exacerbating discipline problems.

The school management representative (at HOD level, but not at the same school as TM) is positive about the concept of the LLOR being acceptable to teachers:

> JN: Yes. It is a fun and interactive way/idea to learn/teach. It takes the boredom out of teaching and learning, especially to ESL learners.

JN is well aware of the language problems experienced by learners in KZN schools, having just completed doctoral research into one area of

language use (i.e. use of English as medium of instruction for isiZulu-speaking learners).

From a teacher-training perspective, AM endorses use of the LLOR:

> I like the idea. Very often this "new age" of learners want to look at a computer screen in order to learn. It would make it much easier for me as even if they don't pay attention in class (and many don't) they can always go to the repository and access information. It will make teaching much easier.

Like JN, AM sees e-Learning as what students like, and a resource which will make teaching easier for the instructor. AM realises that the LLOR would actually solve minor class disciplinary problems such as not paying attention, because the LLOR will always be "on duty" after hours for access to information (Pratt, 2011: 4).

6.7.2 Ease of use of the LLOR

Q.2 In your opinion, is it easy to use? Why/why not?

Understandably, the Help Desk person, the ex-teacher/EdTech member and the computer-skilled teacher find the LLOR easy to use:

> PN: Yes, the design was user friendly and allowed for easy navigation.

> GM: The design is most certainly user friendly- given that the user has knowledge of hyperlinks, and other website basics.

> RE: Yes, it is easy to use. I am experienced with using the internet and this is a familiar environment for me.

TM, who had pointed out that some of his colleagues might not be as computer-skilled as he was, expressed reservations:

> TM: Whilst it is easy for me to use others who may not be very knowledgeable in the use of computers may find it difficult to use. Also this is a whole new idea, and needs courses in its use to be offered to us.

These four responses taken as a whole suggest that it is not so much the intrinsic ease-of-use of the LLOR (or similar applications) which is the issue, but how skilled the users are, and whether they might require training in is use

Once more, JN is optimistic, suggesting that teachers would not need that much up-skilling, and that learners are already sufficiently skilled to use the LLOR:

> JN: Yes. One would require very basic computer skills. Anyway, learners would be interacting with the programme on computer, and they are quite adept at using computers.

AM concurs with JN as to ease of use for teachers:

> It is easy to use. I am not very knowledgeable in the use of computers, but found the system easier to use. It is plain and simple, and the headings and buttons are easier to read and understand.

Note that AM does not use computer jargon but lay language ("the headings and buttons"), so that he is not coming from the position of the Help Desk person or the ex-teacher/EdTech member, but that of a lay person appreciating the ease of use of the LLOR, which is a point in its favour as to its intrinsic ease of use: it is easy because it was *made* to be easy, not because AM knew what buttons to push, like the computer "fundis"

6.7.3 The "fit" of the LLOR with the idea of language teaching/learning

Q.3 Does it fit with your (or your colleagues') idea of language teaching learning? Why/why not?

PN hedges (he is not a language teacher) by focusing on the LLOR's suitability in terms of the generational readiness of today's young teachers as contrasted with their more conservative elders:

> It has had a positive outcome with the younger generation educators, compared to the older generation whom are set in their ways.

GM points out the advantage of language drills and exercises to language learners, and, while it may not be so good with interactive types lessons and exercises, drills and repetitive routines are exactly the kinds of materials best suited for the LLOR:

> GM: Learning a language means familiarising oneself not only to the rules of the language but embodying the rules, which is made possible via repeated iterations – which is facilitated by the language learning object repository.

RE was more cautious about endorsing the LLOR as a suitable medium for language teaching and learning:

> Maybe. I am not absolutely sure about my colleagues' ideas about "language teaching/learning" and I have never been in a position to make such a call (about using technology such as this) in my current practice, but it is worth exploring.

TM echoes the views of more conservative teachers, who are nervous to tackle e-Learning methods:

> I think that many of my colleagues would be scared and are reluctant to have anything to do with computers and teaching using computers and computer-resources such as the repository. Also due to our large class numbers it may be too time-consuming and result in us not spending enough time with individual pupils.

He also reminds us that the realities of school life include large class numbers, and that it is important to have quality time in face-to-face interactions with learners on an individual basis.

JN once more emphasises the positive side: “Using this programme would be very beneficial and exciting.” But then JN is an HOD and does not have the same pupil and timetable loading as classroom teachers.

AM provides a more balanced view in acknowledging the conservative stance of many of his colleagues but pointing out that encouragement and appropriate teacher-education can persuade even conservative teachers to try more innovative teaching methods:

> Coming from the old school many of my colleagues are reluctant to have anything to do with computers. But after showing them the benefits they are willing to give it a try. So, with a little education, I think that I, and my colleagues, can easily be swayed into changing our teaching methods.

6.7.4 Likelihood of successful implementation of the LLOR

Q.4 Do you think it will be successful and catch on?Why/why not?

The following responses make good sense when taken in the context of the attitudes – and earlier replies – of the individuals concerned:

> PN: Yes it will be, as more educators are starting using the LLOR.

GM: I do believe it will be successful and catch on, on condition the South African schools are provided with enabling infrastructure and school teachers become digitally capable.

RE: Maybe. Access to the computers for both my students and I with be a PN-requisite as with Internet access. Without this it would not even be possible to try it out properly.

TM: No, it won't work. We are under too much pressure as it is, and will not cope with using this tool in our classes.

JN: Yes. It is interactive and a fun way of teaching and learning. Learners are kept stimulated. Educators do not have to think of ingenious ways of improving learner performance. It is done for them. Interactive teaching resources are available at a click of a button.

AM: As stated above all it needs is a little training for us to see the benefits, then there will be good buy-in. some may be reluctant at first, but will soon follow when they see the benefits.

While the elements of fun and ease of accessing resources are once again mentioned, the caveats are that infrastructure, properly trained teachers and teacher workload must be such as to support successful implementation of digital artefacts such as the LLOR.

6.7.5 Readiness of the LLOR for immediate use

Q.5 Would teachers (or their colleagues) use it now? Why/why not?

These responses are almost a replay of those to the penultimate question, with PN, however, introducing the issue of standards, GM providing reasons for success rather than focusing on caveats, RE being mildly optimistic, and JN being more firmly so:

PN: Yes, to keep up with the standards of global education I think most educators would like to the LLOR, this would allow them more exposure.

GM: Yes, I think teachers will use it now, knowing that:

- It's progressive
- It's current
- It's easy to use

RE: Yes/Maybe. This would depend on the previous, if it works for me I can encourage my colleagues to try it out but if not then I won't and they won't use it too.

JN: Yes. Definitely. For the reasons stated above.

TM and AM, working at the chalk face, point out that teachers, already exhausted, are facing the task of implementing the CAPS (assessment) system, which will add further stress to their lives.

TM: No. We are faced with too much change and have become burnt out. As you may be aware we have changed to 2-3 different models (e.g. OBE, CAPS etc.) in the last few years and just cannot take more change.

AM: No, not right now. We are changing to the CAPs model and still need to get used to that.

These are real problems which have to be faced as a matter of urgency: they are exigencies which have been introduced by policy makers, whose policies are being contested by the union. The policies were set in place precisely for the reason of "nailing" errant teachers who dodged work on the basis of "not being able to understand outcomes-based education". As

the Senior Education Specialist from the Department of Education later said: “CAPS is putting the nail into the coffin, there are no gaps in terms of CAPS.” Even TM and AM glimpse a ray of hope, however:

> Maybe the new generation of teachers will want to use this as they are more computer savvy.
>
> Perhaps in a year’s time, once we have become comfortable with CAPS, we would consider more changes.

6.7.6 Other comments or suggestions

Q.6 Any other comments or suggestions?

PN suggested that the LLOR might be used outside of its intended use in schools in other areas where language teaching was to be introduced, namely in universities which were implementing a dual language policy, using an indigenous language:

> The LLOR should be experimented in IBE schools as well as government schools. Universities like UKZN have changed the language agreement for students (Zulu is a compulsory subject for all first years); if the LLOR could be modified to include Zulu as well, this would ensure an effective and efficient language understanding.

GM asked whether the contents of the repository were “context specific” and “changeable” (they are both).

RE stressed the need for training:

> What would really help is as mentioned before, provision for orientating me (other teachers) and students with guidance from an experienced person and initial access to computers and the internet.

TM remained pessimistic (understandably):

> Whilst I think that this is an excellent idea, it is just too much for us right now. I have classes of 50-60 and if I didn't stand in front of them and teach discipline would go out the window. Maybe when we have smaller classes and better technology we could use this tool.

However, AM seems to have relented a little, in view of consideration of the LLOR's potential:

> This is an excellent idea, and should be rolled out to other subjects. It will help improve pass rates.

JN confined his comment to commenting on a few typos in the texts of the LLOR, which is, however, an issue which needs to be sorted out, given that this is a *language* learning resource.

6.7.7 Response of the Senior Educational Specialist from the DOBE

While R.R's ratings for potential use of the LLOR are included in Table 6.1, the data from the interview with the Senior Educational Specialist from the DOE will be handled separately, as it in a sense "frames" the responses of the other participants in explaining them, to some extent. The teachers and other players are at most "actors" - or primary agents - working at grass roots level, while RR is part of the policy making and implementation process which shapes their everyday teaching (or teacher-support) activities. He is then part of a powerful agency shaping the form/s education is permitted to take by law, and which provides both constraints and enablements for teachers at lower echelons. R.R pointed out that education was "very hierarchical", saying: "Education has two parts to it, a social and political agenda, and the ruling party." He explained his role as follows:

> You see, our job as Subject Specialist or Curriculum Specialists is to implement policy….There is a link from one to the other, so if we go

> into a school and talk to a educator we cannot only talk about assessment because assessment is only one aspect – *we've got to talk about what the policy says in terms of what you need to teach* (my emphasis).

Policy is promulgated by means of various Departmental (i.e. DOBE) white papers, bulletins, and gazettes:

> Yes, and currently when you teach in a classroom as an educator you've got to have knowledge of three documents: NCS, Assessment Documents, and General Assessment Guidelines. Content is got from the policy at the moment and not from the textbook. This is where lots of people [teachers] make a mistake. The constitution comes from the policy documents, *the constitution to teach comes from the policy documents*, *it tells you what you should teach in the classroom, how you should assess and so on* (my emphasis).

According to R.R, currently (lesson) content is based on policy and not textbooks: policy dictates what teachers should teach and how it should be assessed. The current situation in KZN, it must be remembered, has as its background the failure of outcomes based education (OBE) to address educational inequalities attributed to the apartheid education system – an example of a top-down, policy-driven intervention. The implementation of a very explicit assessment policy (CAPS) to "fix" OBE and "nail down" teacher compliance with policy, is being challenged by the majority teacher union, as it is seen (quite rightly) as an attempt to single out and discipline defaulters who claimed that "they did not know how to implement OBE" (in all fairness, OBE was implemented hastily without proper guidance, for political reasons).

The "agency" which controls teaching and learning is in fact the Education Department, which not only dictates policy, but also controls (through its subject specialists) acknowledgement of – and rewards for – best teaching practice. As the researcher pointed out in the interview, RR had "a more significant role"

then just his job, as he was also involved in “selecting people who represent the best use of technology”.

This is because, in the area of ICT, RR is one of the representatives who interviews and shortlists teachers for the National Teacher Award in the ICT category:

> The teachers that are using innovative ideas to enhance teaching and learning within the classrooms and to communicate with parents and this would mean SMSing parents, downloading video clips, and bringing it into the classroom and putting it onto a laptop, a teacher’s laptop, getting learners to come around the table and letting learners to look at the video clips.

When asked what his interest was in “using technology to support e-learning”, RR replied:

> Being a technology person, obviously my interest is in being technologically literate and for me to be technologically literate I have to be empowered with use of the various media that will help educators, so that I can pass it on to the teachers.

Provision of technology for teaching/learning involves resources, however: “For one the departments have a laptop initiative; you can buy a laptop from Telkom or one of the providers.” Resources depend on budget considerations: “Education is not needs driven, it’s budget driven…So whatever happens will depend on the budget.” Not all educators will receive a laptop, then: “Some will get it, some won’t. Which educator puts his name in the hat first will.” Although, as R.R pointed out, NGOs also donated computers to schools.

Equipment was not the only resource mentioned: well trained teachers are also a resource, and R.R also mentioned up-skilling of teachers in ICT:

> I belong to the NGO called Technology Association. The policy we employ is to identify - is to use teachers with good teaching practice that come and present at these workshops once a term. In my view the university needs to come to the party to work with the schools and have a Saturday class, teachers to develop their skills, show them how to use a data projector, computer skills. You are getting students coming out of these schools. I'm adopting one area – for six months on Saturdays for thirty teachers to take them from A-Z on how to use a computer, spreadsheets, etc.

R.R commented on the problems of unskilled teachers being employed in rural areas:

> One of the problems we have in the deep rural areas is that teachers are being employed not because they have the necessary skills – teachers] who are employed because they are available.

He also expressed concern that the CALL-VLC was being developed for urban schools, but it was pointed out that this was the pilot project only.

Another point relevant to resources is that R.R was expected to manage over 400 schools in a vast rural area, a "huge portfolio", as the researcher commented, to which R.R replied: "The tasks are impossible to complete."

To sum up what the first part of the interview in terms of providing a wider contextual view of the immediate teaching/learning situation in which the LLOR is to be introduced, the following points emerged:

1. Education in KZN is hierarchical and governed by policy, and teachers are obliged to follow departmental guidelines and instructions.

2. Technology is considered important by the Education Department, but resources are not provided evenly in terms of the following:
    a. Equipment
    b. Teacher training
3. Uneven allocation of resources and/or skills occurs because of budgetary constraints.
4. R.R himself as a subject specialist is committed to and enthusiastic about Technology education, including use of ICT, but the scope of his mandate is much too wide for him to cover.

It then becomes understandable why, when the e-Learning fundis (Help desk and EdTech staff) are positive about the introduction of the LLOR, the teachers in the classroom are focused primarily on the rollout of the CAPS programme (Government policy). The HOD might assume that teachers are going to fit in e-learning as well, but the teachers know better. R.R's comments about uneven distribution of resources such as computer equipment and skills training also explain why one of the teachers is much more tentative about introduction of an e-Learning resource than the other (and it must be remembered that these teachers came from urban, and not rural schools, where the situation is worse).

The above, then, was the background to R.R's comments on the CALL-VLC. His response was overall positive:

> I think that it is excellent, anything to develop educators' knowledge and skills is excellent, it encourages people not only to view it but being a technology person, it also makes them browse and edit and they are using it as their knowledge is growing ten-fold and are not aware of it but these are the side-effects.

When asked whether it would fit in with fit with teachers' ideas of language teaching/learning, he once more referred to policy:

> I'm not a language specialist but I think that I would like to see what is current right now*, you need to see what they are saying in the NCS document and if the Thutong content is aligned to it* (my emphasis).

He made the point that it could not be assumed that teachers were always consciously aware of the specifics of policies (e.g. to ensure continuity between grades), and his comments seem to suggest that specifics of policy should be part of the LLOR content:

> When he [the teacher] goes back and reflects on the website, it is there, there must be a form of reference to whatever you do."

He related this specifically to the CAPS policy as applied to language teaching:

> CAPS is putting the nail into the coffin, there are no gaps in terms of CAPS. The term they use for English teaching is called milestones, so those milestones have to be met, you cannot take it and park it for the next term. CAPS is putting the nail into the coffin, there are no gaps in terms of CAPS. The term they use for English teaching is called milestones, so those milestones have to be met, you cannot take it and park it for the next term.

This puts a rather different perspective on possible future content for the LLOR. While the researcher, coming from an LIS background, had seen the importance of categorising content per grade, the including of policies (and steps as to their implementation) had not been considered. This was because the LLOR had been designed "bottom-up", to suit teaching learning needs at the classroom level, and not "top-down", to fit in with imposition of Government policies.

When asked about the chances of the LLOR for successful implementation, he replied:

> The success for me of any program is marketing and training and the collaboration that you have with the various stakeholders… you need to sell your product. You need to be there, you need to be there, show it at a conference, you need to go to a school and show it off and tell them it is free, why don't you use it. It's about getting to people to show them that you are alive. You can't write a program and expect people to find it by accident.

When asked whether teachers would use it, he recommended training as well as marketing:

> Marketing, take it out to the NGO – ABET, there are lots of people involved. You have a link now, the teaching training unit at Indumiso. Why don't you market this to them?

For the LLOR to be used as part of a teacher-training programme in e-Learning organised by DOBE, R.R said that the researcher "would have to work with the people at Head Office", in particular, the ICT section, who are "in charge of eLearning at KZN".

When asked for advice on how best to develop a training program to implement training (if this were the direction taken), R.R said:

> I think that I would look at it in two ways, the first being that you are running it with a private school with facilities; the second is to bring a teacher from out there who does not have facilities and run the training at your facility…. The program must be a long-term program and sustainability must be carefully considered.

6.8 Conclusion

While the quantitative data indicated relative ease of use of the LLOR, the qualitative data offered insights into the current context in the complex social setting in which the LLOR is intended for use. No matter what the technical

abilities of the designer can achieve in terms of a user-friendly LMS, it can be seen that the LLOR's reception in the educational milieu is not so much a matter of the designer's technical skills, as elements of the social structure in which the artefact is to be introduced. Different educator groups are focused on different issues: teacher training and educational technology staff appear to view adoption of technology for learning as a "natural" consequence of technological advances, "a good thing", and the school management representative concurs. On the other hand, the school teachers are very much aware of constraints affecting possible implementation of new methods. Ironically, these constraints – lack of equipment and lack of training – are the very same ones which motivated the researcher to consider introducing the "LLOR-as-an-educational-resource" in the first place.

Teachers are also focused on the upcoming task of implementing the new CAPS (i.e. assessment) policy, which they see as an all-consuming, daunting challenge. The more detailed exposition of the current state of affairs by the Senior Educational Specialist from the DOBE offers insight into the teachers' pre-occupation with the coming implementation of CAPS, which is clearly meant to tie down ("*nail* down") teachers to a consolidated programme of regular assessment, records of which will reveal evidence of the quality of teaching in schools, in terms of both teacher diligence and pupil progress, or the lack thereof: "there are no gaps in terms of CAPS" (R.R). The Senior Educational Specialist emphasizes the importance of government policy: "we've got to talk about what the policy says in terms of what you need to teach", and yet, as a Technology specialist, make efforts to encourage teachers to use digital technology in teaching. The teachers, torn between spending their precious time on introducing new technology, or implementing CAPS, have clearly registered the departmental nuance that the latter is more important in terms of keeping their jobs. "CAPS is putting the nail into the coffin," implies a threat, and the threat has been registered.

Chapter 7: Conclusions and Recommendations

7.1 Introduction

As explained at the outset, this study was involved with providing an educational resource, an online learning object repository, for language learners in schools in KwaZulu-Natal (KZN).This chapter will show how fulfilling the specific objectives resulted in addressing technical, systemic and social structure issues, and will draw conclusions based on the findings in these areas. After reflecting on the research process and its outputs, recommendations will be made as to the further development of the LLOR.

7.2 How objectives 1 and 2 were carried out in artefact design

Artefact design was geared towards achieving objectives 1 and 2, namely:

1. to design and set up an online learning object repository (LOR) for language learners in schools in KwaZulu-Natal;
2. to install various freeware re-usable language learning objects (RLOs) in the LOR.

Application of technical expertise was essential for the actual smooth working and use of the artefact, but the design involved not only fulfilling the functions necessary for service delivery, but also translating the social structure of language teaching and learning into material form. The detailed specifications, then, needed to be carried out so as to harness technical elements to social needs at systemic and deeper social levels.

7.2.1 Designing and setting up an online learning object repository

Designing the LLOR involved first arriving at design specifications. This involved breaking down the solution/s to the perceived social needs into discrete

specifications which then could be translated into a technical system (the LLOR) operating on computers and the Internet. The techno-system (Aunger, 2010: 776), when created, would then make, manifest or represent in material form some of the elements of the social system involved in language teaching/learning. The specifications are in a sense a conceptual bridge reflecting, on the one side, the social elements of the language teaching/learning context in KZN, on the other, the artefact which is being developed, the LLOR. Working back from the specifications, one should be able to arrive at the social structure and social needs from which the specifications were derived; the artefact, in turn, should possess qualities which show that the specifications have been carried out.

social structure ⟶ [specifications] ⟵ artefact

The extent to which the basic specifications of the LLOR were carried out in the end product will be discussed below, under the headings provided by the detailed specifications.

a. Ease of access by users

The artefact was designed for use by registered users, but the prototype was tested out by providing participants with guest access. On the home page of the LLOR (see Figure 8.1) the words "Welcome, Login here" invited potential users to start the registration process[13]. After clicking on the login, users are guided through a standard Moodle registration process (to avoid re-inventing an already tried and tested method).As in standard Moodle procedure, the second option is to log in by clicking on the "Login here!" link, at the same time clicking on the course will allow access as well. In testing out the artefact participants were led through the login process so that it was not possible to assess ease of access by unprepared users.

However, to pre-empt an overall conclusion (based on end-user feedback), some training should be used when introducing the LLOR to KZN teachers. In

[13] In the prototype version tested out, this facility was turned off, as participants were given guest access.

terms of ease of access, however, this was catered for by using standard Moodle procedure, after accessing a web address, and Moodle is generally considered to be very user friendly (Ahmad, Suleiman Alhaji, Umar, Abdu Muhammad & Shehu, 2012: 445).

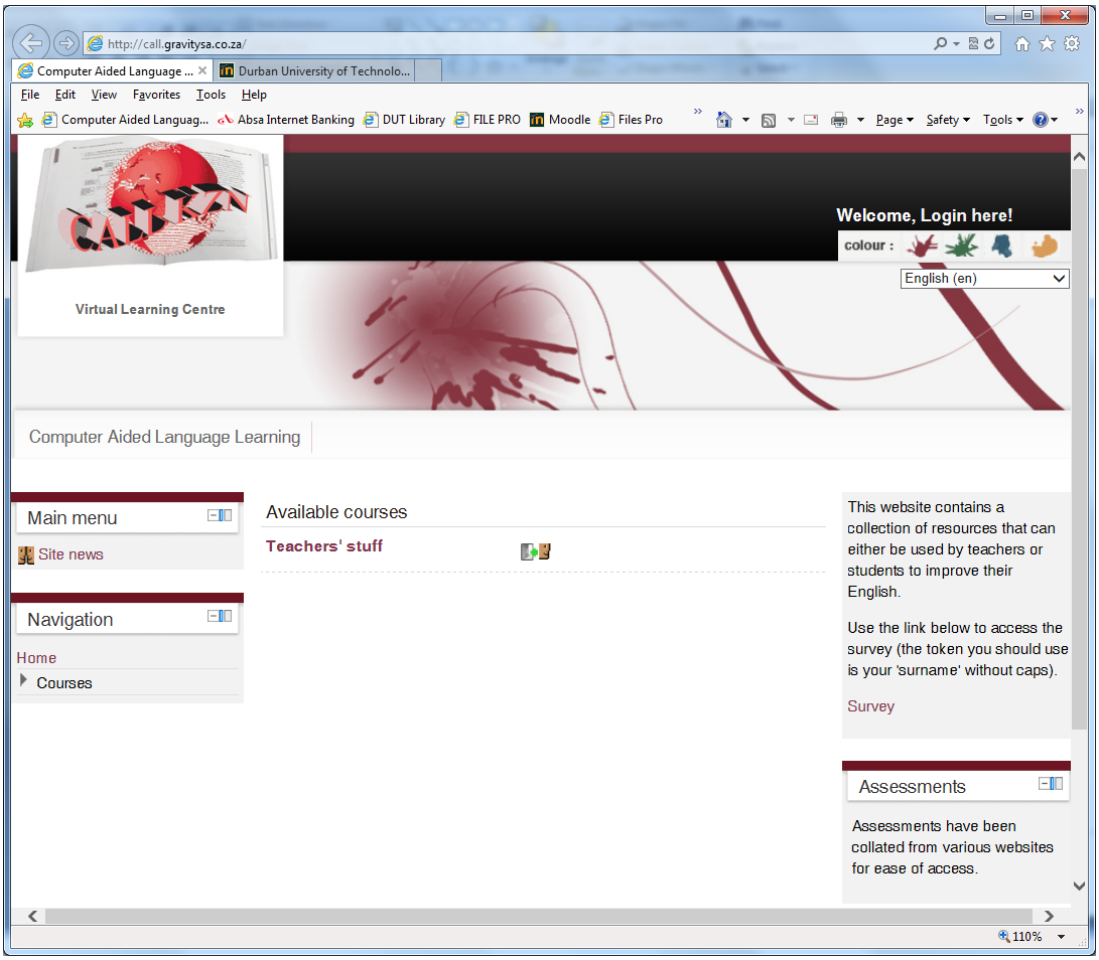


Figure 7.1 Home page of the LLOR with login

b. Ease of operation

Navigation is a key aspect of HCI and the responses from the survey population support the efforts of the researcher to develop an intuitive navigational system (this made easier since it uses Moodle's tried and tested functionality as its basis).

c. Content appropriate for purpose

The researcher's choice of content was supported as appropriate by the survey population's responses discussed in 6.4.3 Rating of the CALL-VLC content, and

summarised in 6.5.2, the main points being that the content was *contexualised,* and *varied* (resources from South Africa, UK and International localities were chosen) thus providing a spread of potential resources for future inclusion in the LLOR.

d. User contribution facility

Moodle (LLOR) has various user roles, specifically that of, “Teacher [who] can do anything within a course, including changing the activities and grading students”. Participating users who want to contribute to the LLOR will be given the “Teacher” role and since this is a routine feature of Moodle it did not require testing. However, if/when a revised version of the LLOR is being planned it would be worthwhile doing more intensive HCI testing including testing the user contribution facility with the target user group.

e. User-friendly input option

As mentioned above the, “User-friendly input option” is facilitated by assigning a ‘role’ which would permit users to contribute directly to the LLOR. The researcher would action any of these requests until such time as the LLOR has grown sufficiently, to necessitate additional support persons and with the proviso that this is provided (volunteered, or funded).

f. Ease of information retrieval

In 6.5.8 Summary of usability data and later in 6.7.2 Ease of use of the LLOR, the former emanating from quantitative responses and the latter from qualitative responses, ease of information retrieval was confirmed as being satisfactory. With respect to the quantitative questioning, it was apparent that the answers could not necessarily be extrapolated to future users but was specific to those that were surveyed, however, answers from the open-ended questioning as TM indicated below was more considered.

> TM: Whilst it is easy for me to use others who may not be very knowledgeable in the use of computers may find it difficult to use. Also this is a whole new idea, and needs courses in its use to be

offered to us.

TM ventured that for other less computer savvy users, training should be provided to improve the ease with which information could be retrieved from the LLOR.

g. Classifying and grading option

The LLOR is flexible enough for different classification and content organisation options to be used, such as, chronologically, by school grades (which seems sensible) or by media type which is how it was initially organised. Since only specimen content was used it was not possible to showcase the ideal option, which is to arrange by grade (Grade 1, Grade 2, Grade 3 and so on.) but this can and will be done when a revision is made in the future.

h. Free/inexpensive web hosting environment

Cost is relative, and in comparison to the other stacks considered (Blackboard, and Plone require a dedicated server with root access which is at the upper tier of costs for web hosting), Moodle (and Joomla, PHP-Nuke and TikiWiki) are relatively inexpensive as these can be installed using Cpanel (or a similar web hosting control panel administration), requiring one MySQL database and PHP functionality on an Apache server. This could cost as little as R75[14] per month at current prices. The LLOR therefore fulfils the specification of requiring an inexpensive web hosting environment.

i. Personal account/login facility

Portal type websites such as Moodle, Joomla, and WordPress has built-in functionality that enables users to personalised part of the website with profile descriptions, a picture and in addition subscribe to feeds from either the same website or external sites. The LLOR meets this specification since users can have their own account, which also means that they can either have course instructor or student roles, some teacher's would need to be course instructors to teach and this is possible with the LLOR.

[14]Hosting costs based on US dollar (USD) vs. Rand (ZAR) exchange rate where $1 cost approximately R8,25

j. Syndication of external content

RSS (Real Simple Syndication) is a web standard that facilitates the adding of news feeds from external websites, this makes the task of ensuring currency much easier, and supports the user-contributed model whilst still maintaining quality control of the content since only authorised users can add RSS feeds.

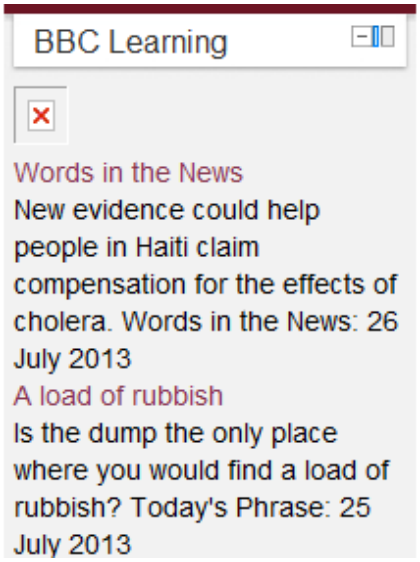


Figure 7.2 Example of Really Simple Syndication (RSS) feed

As shown in Figure 7.2, this constantly updated news feed appearing in the block when entering the LLOR can engage users without them having to navigate deeper into the course; since it changes constantly it gives the website a fresh look which is key to encouraging return visits by users.

k. Brand affinity encouraging use

A significant amount of effort and resources was invested by the researcher in order to customise and re-theme the basic Moodle application, including the design of a logo and complementary colour options. This was done to ensure that the LLOR would be easy to identify, so that users could have a choice in the colour scheme that they used, and that more flexibility in how they used the navigation system was offered (docking and undocking menus were included).

The distinctive image with the words CALL-KZN over an image of the world map (focused on Africa), overlaid onto an open book formed the logo. This was footed by the word, “Virtual Learning Centre”.

I. Open-source type sustainability and support

According to Dougiamas (2007) the Moodle Trust is responsible for the development of the Moodle software and the financing of the Moodle.org community sites. Moodle is funded by royalties and annual fees paid by Moodle Partners (to Moodle Trust) who in return receive priority support and the rights to use Moodle Trust trademarks and other assets. He goes on to indicate that community contributions totalling approximately $15,000 per year in the form of donations is received by Moodle Trust. He concludes by suggesting that, this model has proven stable and seems sustainable for the future”.

Earlier (p. 64) it was shown that the specifications were based on the social needs identified by Makhubu (2012: 92), as follows: the teaching/learning resources needed to be **contextualised** to establish what setting and participants are involved, what type of service is required, and to what extent the service is feasible; **sanctioned** by some form of authorisation and/or consent by authorities and/or participants: **resourced** by human, financial and infrastructural resources; **organised** by the service provider/s so that it is implemented smoothly and efficiently; and **regulated** by means of interpreting codes of conduct, provisions of institutional policies (including quality policies), regular monitoring, and feedback from clients and service providers (2012: 92).

Table 7.1 gives indications from the qualitative data that the functions are viewed as important aspects of service delivery by the Education Department, as reflected in excerpts from the transcripts of the interview with R.R. The functions most often mentioned are sanctioning and resourcing, which fit in with the Senior Subject Specialist’s emphasis on the need for following departmental policies and for both human and technological resources, which are needs this study attempts to address by providing the LLOR.

Table 7.1 Indications of service delivery functions in the qualitative data

SERVICE DELIVERY MUST BE CONTEXTUALISED
When he goes back and reflects on the website, it is there, there must be a form of reference to whatever you do.
SERVICE DELIVERY MUST BE SANCTIONED
I am one of the rep(resentative)s that interview and shortlist teachers for the National Teacher Award for the category ICT
our job as Subject Specialist or Curriculum Specialists is to implement policy
NCS, Assessment Documents, and General Assessment Guidelines
the constitution to teach comes from the policy documents, it tells you what you should teach in the classroom, how you should assess and so on
All these things from the National, education is very hierarchical.
..you need to see what they are saying in the NCS document and if the Thutong content is aligned to it.
What it would do for educators is that it will show that it is relevant, that there are connections from Grade 6 to Grade 7.
I would say to teachers as suggestion, if you are teaching English it will help you.
For E-learning to take place, for that to be implemented you would have to work with the people at Head Office..
SERVICE DELIVERY MUST BE RESOURCED
I have to be empowered with use of the various media that will help educators, so that I can pass it on to the teachers.
conversant and knowledgeable [with the technology]
media…to enhance teaching and learning within the classroom
Teacher Development and up skilling of teachers
laptop initiative
Education is…budget driven…whatever happens will depend on the budget
USAID funding possibilities
NGOs ... give schools computers
teachers…come and present at these workshops
the university needs to … have a Saturday class, teachers to develop their skills, show them how to use a data projector, computer skills.
it [the LLOR] also makes them browse and edit and they are using it as their knowledge is growing ten-fold and are not aware of it but these are the side-effects.
you are running it with a private school with facilities… bring a teacher from out there who does not have facilities and run the training at your facility
SERVICE DELIVERY MUST BE ORGANISED
[Delivery Agreement the Action Plan to 2014]it's a broad based plan of which government are saying where they want to take education
Right now we have a rollout – we have to follow this as well.
Successful implementation, you would call these knock-on effects.
..sustainability must be carefully considered.
roles are…Managing, Research. Marketing, take it out to the NGO – ABET, there are lots of people involved.
SERVICE DELIVERY MUST BE MONITORED
Year plan, tightly controlled and monitored – training days can be changed by a day or two.

7.2.2 Installing various freeware-usable language learning objects in the LLOR

Various freeware re-usable language learning objects were installed in the LLOR to provide examples of how various sample content could be contributed. As mentioned previously, the content appearing in the CALL-VLC was not intended to be exhaustive but rather to be used as "sample content" so that the LLOR could be tested by the survey population. The content was selected in terms of its suitability and contextual value in a specific geographical location, South Africa, more specifically, KwaZulu-Natal. The user ratings of the two South African resources (Thutong and SABC Education), two United Kingdom sites (BBC and OPEN University) and international sites (Internet Archive and SlimeKids), were positive, suggesting that these represented the kinds of sites teachers might want to use – or contribute – themselves. The overall responses support the researcher's choice of content for the LLOR.

7.3 How objectives 3 and 4 were carried out in artefact testing

Artefact testing was geared towards achieving objectives 3 and 4, namely:

3. To test out the operation of the LLOR in terms of teacher and learner access to language learning resources;
4. To obtain responses from users in terms of its potential for facilitating language learning in schools in KwaZulu-Natal.

This involved usability testing of the CALL-VLC, as well as end-user feedback. This section will first deal with usability testing in terms of how the various aspects (a. - l.) described above were rated in usability testing, and then go on to discuss end-user feedback.

7.3.1 Conclusions drawn on usability of the CALL-VLC

The following conclusions on usability testingwere reached, based on the data obtained in usability testing. The usability of the CALL-VLC was tested out on the intended main end user group, namely, teachers with a good (but not specialist) experience of computer usage. As mentioned earlier, most of the

respondents (87.5%) had a high level of computer literacy, and had used popular web browsers such as Internet Explorer and Mozilla Firefox. They had also used web apps such as WordPress and Facebook. Facebook was the highest rated social app followed by Twitter and Linkedin. As navigation is a key aspect of HCI, usability testing focused mainly on ease of the navigation throughout the process of using the CALL-VLC. As mentioned earlier, in terms of relative ease of navigation, the responses support the efforts of the researcher to develop an intuitive navigational system, using Moodle's tried and tested functionality as its basis. However, as also said earlier, efforts to improve categorisation and organisation should be on-going as the LLOR should adapt in response to user feedback and the corresponding web innovations. There may be wider adaptations needed in line with wider shifts in social structure, as ICT techno-systems are a part of the system of relations in the whole "morphogenetic shift" taking place in society.

7.3.2 Conclusions drawn on end user feedback

The LLOR in its present iteration seems useful as a prototype, and its potential as a resource for teachers was confirmed (and summarised from a social point of view in 6.7). The end-user feedback being mainly positive makes further development of the LLOR a desirable future outcome. As RR indicated:

> For the LLOR to be used as part of a teacher-training programme in e-Learning organised by DOBE, R.R said that the researcher "would have to work with the people at Head Office", in particular, the ICT section, who are "in charge of eLearning at KZN".

This implies that the LLOR cannot be developed in isolation, but should instead be done in conjunction with the authorities (namely, DOBE). In addition different versions of the LLOR should be developed such as a mobile-ready version that works on Android, iPad, Windows 8 Apps and so on. A more thorough use of HCI should be employed to ensure that a more user-friendly and accessible application is developed. Training programmes will have to be planned and run to maximise the content *use* and *creation* potential of users of the LLOR.

7.4 General conclusions

This research initiative began as a result of the researchers' perception (based on his experience) that not enough resources existed or were accessible to a specific audience being mainly second language teachers of English (native language being isiZulu) in KwaZulu-Natal, South Africa. The researcher's expertise in the field of Library Science, job as a LMS administrator and over a decade of experience in the field of e-Learning prompted the development of a LLOR to address the gap, namely lack of access to appropriate language related resources. An important aspect of this research project was (after developing the LLOR) to then test the hypothesis by conducting usability studies that profiled the user groups, then invite responses from them, firstly on the usability of the LLOR, and secondly their likelihood to use this LLOR, and finally the probability of them contributing to the LLOR.

7.5 Recommendations

Based on the above conclusions, the following recommendations are made:

- This iteration of the LLOR was by all accounts an adequate product, although a mobile ready version will have to be introduced soon in order to maximise the currency of the LLOR especially with the secondary target audience (learners).
- The content and organisation will have to be aligned to that prescribed by policy and in conjunction with experts from the Department of Basic Education.
- The use of an intuitive design methodology was justified as it promoted a quick development feeding of creativity and the innovative spirit. There is also value in combining elements of a more rigorous design method.

The usability study can be improved and more attention needs to be taken to ensure that the target audience are given adequate opportunities to provide feedback. It would have been useful to use video proxy data collection, as this would have provided insights into the respondent's reaction when interacting with the LLOR. This would have helped to triangulate their electronic responses with their immediate reaction when first interacting with the LLOR.

7.6 Conclusion

While the qualitative data indicated relative ease of use of the LLOR, the qualitative data offered insights into the current context in the complex social setting in which the LLOR is intended for use. No matter what the technical abilities of the designer can achieve in terms of a user-friendly LMS, it can be seen that the LLOR's reception in the educational milieu is not so much a matter of the designer's technical skills, as that of elements of the social structure in which the artefact is to be introduced. Different educator groups are focused on different issues: teacher training and educational technology staff appear to view adoption of technology for learning as a "natural" consequence of technological advances, "a good thing", and the school management representative concurs. On the other hand, the school teachers are very much aware of constraints affecting possible implementation of new methods. Ironically, these constraints – lack of equipment and lack of training – are the very same ones which motivated the researcher to consider introducing the "LLOR-as-educational-resource" in the first place.

Teachers are also focused on the coming task of implementing the new CAPS (i.e. assessment) policy, which they see as an all-consuming, daunting challenge. The more detailed exposition of the current state of affairs by the Senior Educational Specialist from the DOBE offers insight into the teachers' pre-occupation with the coming implementation of CAPS, which is clearly meant to tie down ("*nail* down") teachers to a consolidated programme of regular assessment, records of which will reveal evidence of the quality of teaching in schools, in terms of both teacher diligence and pupil progress, or the lack thereof: "there are no gaps in terms of CAPS" (R.R). The Senior Educational Specialist emphasizes the importance of government policy: "we've got to talk about what the policy says in terms of what you need to teach", and yet, as a Technology specialist, makes efforts to encourage teachers to use digital technology in teaching. The teachers, torn between spending their precious time on introducing new technology, or implementing CAPS, have clearly registered the departmental nuance that the latter is more important in terms of keeping their jobs.

Appendix A: Usability Survey

Section 1: The survey questions set out on Limesurvey

A LEARNING OBJECT REPOSITORY FOR COMPUTER ASSISTED LANGUAGE LEARNING IN ORDER TO PROVIDE RESOURCES FOR LANGUAGE LEARNERS IN SCHOOLS IN KWAZULU-NATAL

Alpha pilot of the computer aided language learning repository (CALL KZN) – usability survey

Please answer all questions. Your cooperation is highly appreciated.

Section 1: Background information

1. Name : _____.
2. Surname : _____.
3. Email address : _____.
4. Designation : _____.
5. Number of years in this role : _____.

6. **Computer experience – How much experience have you had with the following types of computers or related devices?**

   Rate the following from 1 (infrequent) to 5 (very frequent)

6.1. Use of computer/s.	1	2	3	4	5
6.2. Used mainly at work.	1	2	3	4	5
6.3. Used mainly at home.	1	2	3	4	5
6.4. Used equally at work and home.	1	2	3	4	5

7. **Familiarity with computer environment/s - How familiar are you with the following computer environments?**

   Rate the following from 1 (not very familiar) to 5 (very familiar)

7.1. Windows	1	2	3	4	5

7.2.	Mac	1	2	3	4	5
7.3.	Linux	1	2	3	4	5
7.4.	Cloud operating systems	1	2	3	4	5

8. **Internet/web experience – How comfortable are you using the web?**

   Rate the following from 1 (not familiar) to 5 (very familiar)

8.1.	**Internet browsers**- Overall	1	2	3	4	5
8.2.	**Specific browser –** Internet Explorer	1	2	3	4	5
8.3.	**Specific browser –** Mozilla Firefox	1	2	3	4	5
8.4.	**Specific browser –** Safari	1	2	3	4	5
8.5.	**Specific browser –** Opera	1	2	3	4	5
8.6.	**Specific browser –** Netscape Navigator	1	2	3	4	5
8.7.	**Specific browser** – Chrome	1	2	3	4	5

9. **Various web accessible resources are listed below; select the types that you are familiar with. It does not matter if you have not used it, if you know about it select it.**

9.1.	Wikipedia	☐
9.2.	Facebook	☐
9.3.	SharePoint	☐
9.4.	Windows Mesh	☐
9.5.	LimeSurvey, Monkey Survey, etc.	☐
9.6.	Ning	☐
9.7.	Blackboard, Moodle, etc.	☐

10. **Please rate your interaction with the selections from your previous responses, from 1 (least) to 5 (most)**

10.1.	Wikipedia	1	2	3	4	5
10.2.	Facebook	1	2	3	4	5

10.3.	SharePoint	1	2	3	4	5
10.4.	Windows Mesh	1	2	3	4	5
10.5.	LimeSurvey, Monkey Survey, etc.	1	2	3	4	5
10.6.	Ning	1	2	3	4	5
10.7.	Blackboard, Moodle, etc.	1	2	3	4	5
10.8.	Pebbles	1	2	3	4	5
10.9.	Twitter	1	2	3	4	5

Section 2: Usability of LOR

11. How is easy or difficult are the following actions to do, 1 (least difficult) to 5 (most difficult)?

11.1.	Going forward and backwards	1	2	3	4	5
11.2.	Finding an item	1	2	3	4	5
11.3.	Locating a category	1	2	3	4	5
11.4.	Locating a resource	1	2	3	4	5
11.5.	Locating by browsing	1	2	3	4	5
11.6.	Overall navigation	1	2	3	4	5
11.7.	Downloading an item	1	2	3	4	5

Section 3: Statistics derived from the survey

Number of records in this query:	**17**		
Total records in survey:	17		
Percentage of total:	100.00 %		
Field summary for SA1			
1. Which of these describes your main function.			
Answer	Count	Percentage	
Primary school student (SA1)	0	0.00%	
High school student (SA2)	0	0.00%	
Post secondary student (college, UOT, university etc.) (SA3)	1	5.88%	
Teacher at school (SA4)	10	58.82%	
Lecturer at HEI (Higher Education Institution) (SA5)	5	29.41%	
Other	1	5.88%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA2			
2. Number of years in this role			
Answer	Count	Percentage	
0-3 years (A1)	5	29.41%	
3-5 years (A2)	3	17.65%	
5-8 years (A3)	0	0.00%	
More than 8 years (A4)	9	52.94%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA3			
3. Computer experience - how often do you use computers?			
Answer	Count	Percentage	**Sum**
1 (1)	1	5.88%	**5.88%**
2 (2)	0	0.00%	
3 (3)	1	5.88%	**5.88%**
4 (4)	1	5.88%	
5 (5)	14	82.35%	**88.24%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	4,59		
Standard deviation	1,06		
Field summary for SA4 (SA701)			
4. Computer experience - How much experience have you had with the following operating systems? [Mac]			

Answer	Count	Percentage	
1 (A1)	9	52.94%	
2 (A2)	3	17.65%	
3 (A3)	2	11.76%	
4 (A4)	0	0.00%	
5 (A5)	3	17.65%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA4(SA702)			
4. Computer experience - How much experience have you had with the following operating systems?[Linux]			
Answer	Count	Percentage	
1 (A1)	14	82.35%	
2 (A2)	3	17.65%	
3 (A3)	0	0.00%	
4 (A4)	0	0.00%	
5 (A5)	0	0.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA4(SA703)			
4. Computer experience - How much experience have you had with the following operating systems? [Windows]			
Answer	Count	Percentage	
1 (A1)	0	0.00%	
2 (A2)	1	5.88%	
3 (A3)	1	5.88%	
4 (A4)	1	5.88%	
5 (A5)	14	82.35%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA5(SA811)			
5. What web browsers are you familiar with? [Internet Explorer]			
Answer	Count	Percentage	Sum
1 (1)	0	0.00%	5.88%
2 (2)	1	5.88%	
3 (3)	0	0.00%	0.00%
4 (4)	1	5.88%	
5 (5)	15	88.24%	94.12%
Sum (Answers)	17	100.00%	100.00%
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	4,76		
Standard deviation	0,75		

Field summary for SA5 (SA812)			
5. What web browsers are you familiar with? [Mozilla Firefox]			
Answer	Count	Percentage	**Sum**
1 (1)	4	23.53%	**29.41%**
2 (2)	1	5.88%	
3 (3)	3	17.65%	**17.65%**
4 (4)	0	0.00%	
5 (5)	9	52.94%	**52.94%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,53		
Standard deviation	1,74		
Field summary for SA5 (SA813)			
5. What web browsers are you familiar with? [Safari]			
Answer	Count	Percentage	**Sum**
1 (1)	10	58.82%	**58.82%**
2 (2)	0	0.00%	
3 (3)	3	17.65%	**17.65%**
4 (4)	2	11.76%	
5 (5)	2	11.76%	**23.53%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	2,18		
Standard deviation	1,55		
Field summary for SA5 (SA814)			
5. What web browsers are you familiar with? [Google Chrome]			
Answer	Count	Percentage	**Sum**
1 (1)	2	11.76%	**23.53%**
2 (2)	2	11.76%	
3 (3)	0	0.00%	**0.00%**
4 (4)	2	11.76%	
5 (5)	11	64.71%	**76.47%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	4,06		
Standard deviation	1,52		

Field summary for SA5(SA815)			
5. What web browsers are you familiar with? [Opera]			
Answer	Count	Percentage	**Sum**
1 (1)	12	70.59%	**70.59%**
2 (2)	0	0.00%	
3 (3)	1	5.88%	**5.88%**
4 (4)	2	11.76%	
5 (5)	2	11.76%	**23.53%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	1,94		
Standard deviation	1,56		
Field summary for SA5 (SA816)			
5. What web browsers are you familiar with? [Netscape Navigator]			
Answer	Count	Percentage	**Sum**
1 (1)	13	76.47%	**82.35%**
2 (2)	1	5.88%	
3 (3)	1	5.88%	**5.88%**
4 (4)	1	5.88%	
5 (5)	1	5.88%	**11.76%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	1,59		
Standard deviation	1,23		
Field summary for SA6 (SA611)			
6. From the list below, select all those that you have used before. [Ning]			
Answer	Count	Percentage	
Yes (Y)	2	11.76%	
No (N)	14	82.35%	
Uncertain (U)	1	5.88%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA6(SA612)			
6. From the list below, select all those that you have used before. [Wikipedia]			
Answer	Count	Percentage	
Yes (Y)	15	88.24%	
No (N)	2	11.76%	

Uncertain (U)	0	0.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA6(SA613)			
6. From the list below, select all those that you have used before. [SharePoint]			
Answer	Count	Percentage	
Yes (Y)	3	17.65%	
No (N)	11	64.71%	
Uncertain (U)	3	17.65%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA6 (SA614)			
6. From the list below, select all those that you have used before. [Blackboard, Moodle, etc.]			
Answer	Count	Percentage	
Yes (Y)	11	64.71%	
No (N)	4	23.53%	
Uncertain (U)	2	11.76%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA6 (SA615)			
6. From the list below, select all those that you have used before. [Facebook, Myspace, etc.]			
Answer	Count	Percentage	
Yes (Y)	12	70.59%	
No (N)	2	11.76%	
Uncertain (U)	3	17.65%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA6 (SA616)			
6. From the list below, select all those that you have used before. [WordPress, Blogger, etc.]			
Answer	Count	Percentage	
Yes (Y)	7	41.18%	
No (N)	8	47.06%	
Uncertain (U)	2	11.76%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA6 (SA617)			
6. From the list below, select all those that you have used before. [LimeSurvey, Monkey Survey, etc.]			
Answer	Count	Percentage	

Yes (Y)	4	23.53%	
No (N)	10	58.82%	
Uncertain (U)	3	17.65%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Field summary for SA6a11			
6.1 Please tell me more about how you used Ning.			
Answer	Count	Percentage	
Contributor, author, publisher (SQ61)	0	0.00%	
Viewer (SQ62)	2	11.76%	
Other	0	0.00%	
Field summary for SA6b12			
6.2 Please tell me how you have used Wikipedia.			
Contributor, Editor, etc.	2	11.76%	
Viewer	15	88.24%	
Other	0	0.00%	
Field summary for SA6c13			
6.3 Please tell me how you have used SharePoint.			
Answer	Count	Percentage	
Main author (SA6a)	0	0.00%	
Contributor, collaborator (SA6b)	1	5.88%	
Viewer (SA6c)	3	17.65%	
Other	0	0.00%	
Field summary for SA614a			
6.4 Please say how you have used Blackboard / WebCT / Moodle.			
Answer	Count	Percentage	
Designer/Teacher/Course Builder (SA614)	5	29.41%	
Student/Guest (SA615)	8	47.06%	
Field summary for SA615a (SQ001)			
6.5 How actively do you use your 'public' social tool. [Facebook.]			
Answer	Count	Percentage	**Sum**
1 (1)	1	5.88%	**11.76%**
2 (2)	1	5.88%	
3 (3)	1	5.88%	**5.88%**
4 (4)	3	17.65%	
5 (5)	6	35.29%	**52.94%**
Sum (Answers)	12	100.00%	**100.00%**
Number of cases	12	100.00%	
No answer	0	0.00%	
Not displayed	5	29.41%	
Arithmetic mean	4		

Standard deviation	1,35		
Field summary for SA615a (SQ002)			
6.5 How actively do you use your 'public' social tool. [Myspace.]			
Answer	Count	Percentage	**Sum**
1 (1)	7	41.18%	**58.82%**
2 (2)	3	17.65%	
3 (3)	2	11.76%	**11.76%**
4 (4)	0	0.00%	
5 (5)	0	0.00%	**0.00%**
Sum (Answers)	12	100.00%	**100.00%**
Number of cases	12	100.00%	
No answer	0	0.00%	
Not displayed	5	29.41%	
Arithmetic mean	1,58		
Standard deviation	0,79		
Field summary for SA615a (SQ003)			
6.5 How actively do you use your 'public' social tool. [Twitter.]			
Answer	Count	Percentage	**Sum**
1 (1)	4	23.53%	**41.18%**
2 (2)	3	17.65%	
3 (3)	0	0.00%	**0.00%**
4 (4)	2	11.76%	
5 (5)	3	17.65%	**29.41%**
Sum (Answers)	12	100.00%	**100.00%**
Number of cases	12	100.00%	
No answer	0	0.00%	
Not displayed	5	29.41%	
Arithmetic mean	2,75		
Standard deviation	1,71		
Field summary for SA615a(SQ004)			
6.5 How actively do you use your 'public' social tool. [Academia.]			
Answer	Count	Percentage	**Sum**
1 (1)	7	41.18%	**52.94%**
2 (2)	2	11.76%	
3 (3)	3	17.65%	**17.65%**
4 (4)	0	0.00%	
5 (5)	0	0.00%	**0.00%**
Sum (Answers)	12	100.00%	**100.00%**
Number of cases	12	100.00%	
No answer	0	0.00%	
Not displayed	5	29.41%	
Arithmetic mean	1,67		
Standard deviation	0,89		

Field summary for SA615a (SQ005)			
6.5 How actively do you use your 'public' social tool. [Linkedin.]			
Answer	Count	Percentage	**Sum**
1 (1)	4	23.53%	**47.06%**
2 (2)	4	23.53%	
3 (3)	1	5.88%	**5.88%**
4 (4)	2	11.76%	
5 (5)	1	5.88%	**17.65%**
Sum (Answers)	12	100.00%	**100.00%**
Number of cases	12	100.00%	
No answer	0	0.00%	
Not displayed	5	29.41%	
Arithmetic mean	2,33		
Standard deviation	1,37		
Field summary for SA616			
6.6 How frequently do you blog?			
Answer	Count	Percentage	
Daily (A1)	0	0.00%	
Weekly (A2)	3	17.65%	
Monthly (A3)	1	5.88%	
Can't remember the last time (A4)	3	17.65%	
Other	0	0.00%	
No answer	0	0.00%	
Not displayed	10	58.82%	
Field summary for SA17a			
6.7 How have you used surveys?			
Answer	Count	Percentage	
I created the survey on my own. (SA17a)	2	11.76%	
Someone else created the survey for me (I supplied the questions). (SA17b)	2	11.76%	
Field summary for SB8 (SB111)			
7. How is easy or difficult are the following actions to do, 1 (very easy) to 5 (most difficult)? [Going forward and backwards]			
Answer	Count	Percentage	**Sum**
1 (1)	3	17.65%	**29.41%**
2 (2)	2	11.76%	
3 (3)	4	23.53%	**23.53%**
4 (4)	1	5.88%	
5 (5)	7	41.18%	**47.06%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,41		

Standard deviation	1,58		
Field summary for SB8 (SB112)			
7. How is easy or difficult are the following actions to do, 1 (very easy) to 5 (most difficult)? [Finding an item]			
Answer	Count	Percentage	**Sum**
1 (1)	2	11.76%	**29.41%**
2 (2)	3	17.65%	
3 (3)	3	17.65%	**17.65%**
4 (4)	4	23.53%	
5 (5)	5	29.41%	**52.94%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,41		
Standard deviation	1,42		
Field summary for SB8 (SB113)			
7. How is easy or difficult are the following actions to do, 1 (very easy) to 5 (most difficult)? [Locating a category]			
Answer	Count	Percentage	**Sum**
1 (1)	3	17.65%	**29.41%**
2 (2)	2	11.76%	
3 (3)	5	29.41%	**29.41%**
4 (4)	4	23.53%	
5 (5)	3	17.65%	**41.18%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,12		
Standard deviation	1,36		
Field summary for SB8 (SB114)			
7. How is easy or difficult are the following actions to do, 1 (very easy) to 5 (most difficult)? [Locating a resource]			
Answer	Count	Percentage	**Sum**
1 (1)	2	11.76%	**29.41%**
2 (2)	3	17.65%	
3 (3)	4	23.53%	**23.53%**
4 (4)	4	23.53%	
5 (5)	4	23.53%	**47.06%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	

Arithmetic mean	3,29		
Standard deviation	1,36		
Field summary for SB8 (SB115)			
7. How is easy or difficult are the following actions to do, 1 (very easy) to 5 (most difficult)? [Locating by browsing]			
Answer	Count	Percentage	**Sum**
1 (1)	3	17.65%	**29.41%**
2 (2)	2	11.76%	
3 (3)	3	17.65%	**17.65%**
4 (4)	7	41.18%	
5 (5)	2	11.76%	**52.94%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,18		
Standard deviation	1,33		
Field summary for SB8 (SB116)			
7. How is easy or difficult are the following actions to do, 1 (very easy) to 5 (most difficult)? [Downloading an item]			
Answer	Count	Percentage	**Sum**
1 (1)	4	23.53%	**29.41%**
2 (2)	1	5.88%	
3 (3)	4	23.53%	**23.53%**
4 (4)	5	29.41%	
5 (5)	3	17.65%	**47.06%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,12		
Standard deviation	1,45		
Field summary for SB8 (SB117)			
7. How is easy or difficult are the following actions to do, 1 (very easy) to 5 (most difficult)? [Overall navigation]			
Answer	Count	Percentage	**Sum**
1 (1)	2	11.76%	**41.18%**
2 (2)	5	29.41%	
3 (3)	2	11.76%	**11.76%**
4 (4)	4	23.53%	
5 (5)	4	23.53%	**47.06%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	

No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,18		
Standard deviation	1,42		
Field summary for SB9 (SB12a)			
8. Rate the websites that are recommended on this website, use 1 for least useful to 5 for most useful. [Thutong (http://wwww.thutong.doe.gov.za)]			
Answer	Count	Percentage	**Sum**
1 (1)	1	5.88%	**17.65%**
2 (2)	2	11.76%	
3 (3)	6	35.29%	**35.29%**
4 (4)	2	11.76%	
5 (5)	6	35.29%	**47.06%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,59		
Standard deviation	1,28		
Field summary for SB9 (SB12b)			
8. Rate the websites that are recommended on this website, use 1 for least useful to 5 for most useful. [BBC (http://bbc.co.uk/worldservice/learningenglish/]			
Answer	Count	Percentage	**Sum**
1 (1)	1	5.88%	**23.53%**
2 (2)	3	17.65%	
3 (3)	4	23.53%	**23.53%**
4 (4)	6	35.29%	
5 (5)	3	17.65%	**52.94%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,41		
Standard deviation	1,18		
Field summary for SB9 (SB12c)			
8. Rate the websites that are recommended on this website, use 1 for least useful to 5 for most useful. [Internet Archive (http://www.archive.org)]			
Answer	Count	Percentage	**Sum**
1 (1)	0	0.00%	**11.76%**
2 (2)	2	11.76%	
3 (3)	4	23.53%	**23.53%**
4 (4)	7	41.18%	
5 (5)	4	23.53%	**64.71%**
Sum (Answers)	17	100.00%	**100.00%**

Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,76		
Standard deviation	0,97		
Field summary for SB9 (SB12d)			
8. Rate the websites that are recommended on this website, use 1 for least useful to 5 for most useful. [SABC Education (http://www.sabceducation.co.za)]			
Answer	Count	Percentage	**Sum**
1 (1)	0	0.00%	**11.76%**
2 (2)	2	11.76%	
3 (3)	8	47.06%	**47.06%**
4 (4)	3	17.65%	
5 (5)	4	23.53%	**41.18%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,53		
Standard deviation	1,01		
Field summary for SB9 (SB12e)			
8. Rate the websites that are recommended on this website, use 1 for least useful to 5 for most useful. [The Open University (http://openlearn.open.ac.uk/)]			
Answer	Count	Percentage	**Sum**
1 (1)	1	5.88%	**11.76%**
2 (2)	1	5.88%	
3 (3)	5	29.41%	**29.41%**
4 (4)	5	29.41%	
5 (5)	5	29.41%	**58.82%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	3,71		
Standard deviation	1,16		
Field summary for SB9 (SB12f)			
8. Rate the websites that are recommended on this website, use 1 for least useful to 5 for most useful. [Slimekids (http://www.slimekids.com)]			
Answer	Count	Percentage	**Sum**
1 (1)	4	23.53%	**35.29%**
2 (2)	2	11.76%	
3 (3)	5	29.41%	**29.41%**
4 (4)	3	17.65%	

5 (5)	3	17.65%	**35.29%**
Sum (Answers)	17	100.00%	**100.00%**
Number of cases	17	100.00%	
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	2,94		
Standard deviation	1,43		
Field summary for SB10			
9. Which search engines do you use?			
Answer	Count	Percentage	
Alta Vista (SB13a)	0	0.00%	
Ananzi (SB13b)	1	5.88%	
Bing (SB13c)	3	17.65%	
Google (SB13d)	17	100.00%	
Yahoo (SB13e)	10	58.82%	
Other	1	5.88%	

Appendix B: Transcript of Interview with DOBE Senior Educational Specialist

Background to interview and purpose

The CALL-VLC was designed and set up to assist teachers and learners. Education operates within a hierarchical top down system that uses administrators at different levels of the Department of Education to ensure that there is consistency in its delivery. Policy implementation is one way that the DOE monitors the success/failure of its endeavours, and Education Specialists such as the interviewee perform a vital role in modelling the use of and supporting complementary resources such as CALL-VLC. A representative of the Department of Basic Education (DOBE) R.R, volunteered to try out and give feedback on the LLOR. BB's portfolio is Senior Education Specialist for Natural Science and Technology. He was asked various questions to find out if this resource had any merit and he was then invited to test-drive it followed by him completing an evaluation.

Date of interview:	**11 March 2013**
Place of interview:	Research & Postgraduate Support Office 2nd Floor Berwyn Court, Steve Biko Campus, Durban University of Technology Durban, South Africa
Interviewer:	Preggy (Pregalathan) Reddy
Interviewee:	R.R

Transcription of interview of R.R PRE-LLOR testing

Researcher	**Just to establish your role, what is your position in the Department of Education?**
R.R]	In the DOE my portfolio is Senior Education Specialist for Natural Science and Technology.
Researcher	Senior Educational Specialist…
	Natural Science and Technology.
Researcher	And that's within a certain region…
R.R]	In the [removed] district, and I manage approximately 450 schools.
Researcher	450 schools, that's a huge portfolio, no wonder you are so busy.
R.R]	The tasks are impossible to complete.
R.R]	In technology, in the Senior Phase I am alone, and for science we share the load between three people.
Researcher	So in technology which really is where our areas are basically overlapping, what's your interest in using technology to support e-Learning?
R.R]	Being a technology person, obviously my interest is in being technologically literate, and for me to be technologically literate, I have to be empowered with use of the various media that will help educators, so that I can pass it on to the teachers.
Researcher	So you would say that by modelling your understanding of the use technology, you would be in that way - you would be assisting teachers. So first of all you make sure that you are conversant with the technology.
R.R]	Yes conversant and knowledgeable
Researcher	So you are always up-skilling?
R.R]	You see besides being the Senior Educational Specialist in the Coastal Cluster, I am one of the rep[resentative]s that interview and shortlist teachers for the National Teacher Award for the

	category ICT.
Researcher	So you have a more significant role then just your job, you also are involved in selecting people who represent the best use of technology…
R.R]	The best teachers
Researcher	The best teachers.
R.R]	The teachers that are using innovative ideas to enhance teaching and learning within the classrooms and to communicate with parents and this would mean sms'ing parents, downloading video clips and bringing it into the classroom and putting it onto a laptop, a teacher's laptop, getting learners to come around the table and letting learners to look at the video clips.
R.R]	While technology is a learning area has it own knowledge contents, it is basically based on four concepts, communication, structures, systems and control broken down into mechanical and electrical systems and control, On the mechanical you get mechanical and hydraulics and pneumatics, under communication you get people using various types of communication to enhance these content areas in the senior phase currently as it stands.
R.R]	What we are saying is that if you are teaching "Processing" [i.e. in mechanical systems], how would you communicate this message to the learners. What kind of media would you bring or use to enhance teaching and learning within the classroom. How would communicate what is going on within the classroom to your parents. Do you understand?
Researcher	Yeah…
R.R]	If you are teaching children, how are going to teach them...scaffold, learners see it not in abstract but in concrete this is how we [train teachers].
Researcher	So thanks for that, that was very informative, going back to the Government Gazette – we were trying to figure out what it says, is there a couple of guiding documents.

R.R]	You see, our job as Subject Specialist or Curriculum Specialists is to implement policy, that's what we implement Government policy for us to implement policies we must know what is contained in these policies and these policies are all read together and not in isolation. There is a link from one to the other, so if we go into a school and talk to a educator we cannot only talk about assessment because assessment is only one aspect – we got to talk about what the policy says in terms of what you need to teach.
Researcher	So there are various policies…
R.R]	Yes, and currently when you teach in a classroom as an educator you got to have knowledge of three documents NCS, Assessment Documents, and General Assessment Guidelines. Content is got from the policy at the moment and not from the textbook. This is where a - lots of people (teachers) make a mistake. The constitution comes from the policy documents, the constitution to teach comes from the policy documents, it tells you what you should teach in the classroom, how you should assess and so on.
Researcher	I came across one of these policies called the National Reform Strategy, its called Delivery Agreement the Action Plan to 2014
R.R]	I have seen it, it's a broad based plan of which government are saying where they want to take education
Researcher	By 2014…
R.R]	Yes, not only education but HIV and Aids, its about Teacher Development and up skilling of teachers, empowering communities, food programmes, a lot of thinks brought together as government vision. Education has two parts to it, a social and political agenda, and the ruling party.
Researcher	Guiding what you are doing, in terms of timelines is this something that you'll plan…
R.R]	All these things from the National, education is very hierarchical
Researcher	Closely controlled and managed.
R.R]	Right now we have a rollout – we have to follow this as well.

R.R]	Year plan tightly controlled and monitored – training days can be changed by a day or two.
Researcher	Not but much -
R.R]	Successful implementation, you would call these knock-on effects.
Researcher	In terms of rollout.
R.R]	For one the departments have a laptop initiative, you can buy a laptop from Telkom or one of the providers. Education is not needs driven its budget driven.
P.R]	Ok, is that similar to how education is run in other countries, similar to ours – we not first or third world but in between.
R.R]	So whatever happens will depend on the budget. Some will get it, some won't. Which educator puts his name in the hat first will receive their first.
Researcher	Is that program still rolling out?
R.R]	As far as I know this is still being implemented, where you would get a data card or something similar.
Researcher	The reason I'm quite interested in this is because we are also looking at USAID funding possibilities are being investigated that could dovetail into this type of imitative. So there are lots of funding possibilities.
R.R]	There are lots of NGO's that we are not aware of that work in certain districts that give schools computers, the RA[E]DCAP foundation is one of them that has done lot of work like this. I belong to the NGO called Technology Association. The policy we employ is to identify – is to use teachers with good teaching practice, that come and present at these workshops once a term.
R.R]	In my view the university needs to come to the party to work with the schools and have a Saturday class, teachers to develop their skills, show them how to use a data projector, computer skills. You are getting students coming out of these schools. I'm adopting one area – for six months on Saturdays for thirty teachers to take them from A-Z on how to use a computer,

	spreadsheets, etc.
	One of the problems we have in the deep rural areas is that teachers are being employed not because they have the necessary skills - who are employed because they are available.
	A journalism student teaching technology at a school that is a practical subject – not sensible.
Researcher	You will be very pleased to hear that we are doing something similar we going to be run a workshop to train teachers. [Prof] Pratt and I are co-running this workshop.
R.R]	My concern is that you are developing this for schools around you.
P.R]	This is pilot, so we want to see if it viable.
R.R]	That's fine.
Researcher	Just to establish your role, what is your position in the Department of [Basic] Education.
R.R]	In the DOE my portfolio is Senior Education Specialist for Natural Science and Technology.
Researcher	Senior Educational Specialist…
R.R]	Natural Science and Technology.
Researcher	And that's within a certain region…
R.R]	In the Illembe district, and I manage approximately 450 schools.
Researcher	450 schools, that's a huge portfolio, no wonder you are so busy.
R.R]	The tasks are impossible to complete.
R.R]	In technology, in the Senior Phase I am alone, and for science we share the load between three people.
Researcher	So in technology which really is where our areas are basically overlapping, what's your interest in using technology to support e-Learning?
R.R]	Being a technology person, obviously my interest is in being technologically literate, and for me to be technologically literate, I have to be empowered with use of the various media that will help

	educators, so that I can pass it on to the teachers.
Researcher	So you would say that by modelling your understanding of the use technology, you would be in that way - you would be assisting teachers. So first of all you make sure that you are conversant with the technology.
R.R]	Yes conversant and knowledgeable
Researcher	So you are always up-skilling?
R.R]	You see besides being the Senior Educational Specialist in the Coastal Cluster, I am one of the rep[resentative]s that interview and shortlist teachers for the National Teacher Award for the category ICT.
Researcher	So you have a more significant role then just your job, you also are involved in selecting people who represent the best use of technology…
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	enhance teaching and learning within the classroom. How would communicate what is going on within the classroom to your parents. Do you understand?
Researcher	Yeah…
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Researcher	So thanks for that, that was very informative, going back to the Government Gazette – we were trying to figure out what it says, is there a couple of guiding documents.
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R.R]	I have seen it, it's a broad based plan of which government are saying where they want to take education
Researcher	By 2014…

R.R]	Yes, not only education but HIV and Aids, its about Teacher Development and up skilling of teachers, empowering communities, food programmes, a lot of thinks brought together as government vision. Education has two parts to it, a social and political agenda, and the ruling party.
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	One of the problems we have in the deep rural areas is that teachers are being employed not because they have the necessary skills - who are employed because they are available.
	A journalism student teaching technology at a school that is a practical subject – not sensible.
Researcher	You will be very pleased to hear that we are doing something similar we going to be run a workshop to train teachers. [Prof] Pratt and I are co-running this workshop.
R.R]	My concern is that you are developing this for schools around you.
Researcher	This is pilot, so we want to see if it viable.
R.R]	That's fine.

The interview ran for 21:30 minutes. R.R was thanked for his participation and the asked if he could continue with the next part, which was to evaluate the CALL-VLC. He agreed and we moved to the computer to start with this.

Transcription of interview of R.R POST-LLOR testing

P.R]	**What is your response to this teaching / learning resource? Why?**
R.R]	I think that it is excellent, anything to develop educators knowledge and skills is excellent, it encourages people not only to view it but being a technology person, it also makes them browse and edit and they are using it as their knowledge is growing ten-fold and are not aware of it but these are the side-effects.
P.R]	Do you think it will fit with teachers' ideas of language teaching/learning? Why/why not? (Does it fit his idea of language instruction?)
R.R]	I'm not a language specialist but I think that I would like to see what is current right now, you need to see what they are saying in the NCS document and if the Thutong content is aligned to it. What it would do for educators is that it will show that it is relevant, that there are connections from Grade 6 to Grade 7. In Grade 6 this is what you taught the learners, in Grade 10 this is what we are doing.
P.R]	So there must be a connection…
R.R]	Without connections you cannot teach.
P.R]	Do you think teachers will be able to use it? Why/why not (suggest improvements, including content).
R.R]	We must not take it for granted that the teachers know or don't know. It's not good to generalize. This is what we are going to do, this is where we need to take it, even if the teacher knows and has forgotten. When he goes back and reflects on the website, it is there, there must be a form of reference to whatever you do.
R.R]	CAPS is putting the nail into the coffin, there are no gaps in terms of CAPS. The term they use for English teaching is called milestones, so those milestones have to be met, you cannot take it and park it for the next term.
P.R]	Do you think it will be successful/used/catch on? Why/why not?
R.R]	The success for me of any program is marketing and training and the collaboration that you have with the various stakeholders… you need to sell your product. You need to be there, you need to be there, show it at a

	conference, you need to go to a school and show it off and tell them it is free, why don't you use it. It's about getting to people to show them that you are alive. You can't write a program and expect people to find it by accident.
P.R]	Would his teachers use it now? Why/why not? [If the reply is that they/students have no access to computers or the Internet, ask if they would use it if it were available on cell phone.]
R.R]	I would say to teachers as suggestion, if you are teaching English it will help you. Read Research. Seven roles are – Managing, Research. Marketing, take it out to the NGO – ABET, there are lots of people involved. You have a link now, the teaching training unit at Indumiso. Why don't you market this to them?
P.R]	Could it be used as part of a teacher-training programme in e-Learning organised by DOBE?
R.R]	For E-learning to take place, for that to be implemented you would have to work with the people at Head Office, called ICT they are in charge of eLearning at KZN. I can tell you who to contact.
P.R]	What advice do you have on how best to develop a training program to implement training if we were going in that direction?
R.R]	I think that I would look at it in two ways, the first being that you are running it with a private school with facilities; the second is to bring a teacher from out there who does not have facilities and run the training at your facility.
P.R]	Why/why not? Are there any adaptations, which would make it more suited to this purpose?
P.R]	How do you see training taking place?
	The program must be a long-term program and sustainability must be carefully considered.
P.R]	Is there anything else you would like to say?
R.R]	I wish you luck and success in your endeavours.

R.R was thanked for his contributions and the recording stopped.

Appendix C: Responses from Educators

Respondent: AM

Questions

Is the concept - or idea - of a "language learning object repository" acceptable to you (teachers)? Why/why not?

I like the idea. Very often this "new age" of learners want to look at a computer screen in order to learn. It would make it much easier for me as even if they don't pay attention in class (and many don't) they can always go to the repository and access information. It will make teaching much easier.

In your opinion, is it easy to use? Why/why not?

It is easy to use. I am not very knowledgeable in the use of computers, but found the system easier to use. It is plain and simple, and the headings and buttons are easier to read and understand.

Does it fit with your (or your colleagues') idea of language teaching learning? Why/why not?

Coming from the old school many of my colleagues are reluctant to have anything to do with computers. But after showing them the benefits they are willing to give it a try. So, with a little education, I think that I, and my colleagues, can easily be swayed into changing our teaching methods.

Do you think it will be successful and catch on? Why/why not?

As stated above all it needs is a little training for us to see the benefits, then there will be good buy-in. Some may be reluctant at first, but will soon follow when they see the benefits.

Would teachers (or their colleagues) use it now? Why/why not?

No, not right now. We are changing to the CAPs model and still need to get used to that. Perhaps in a years' time, once we have become comfortable with CAPS we would consider more changes.

Any other comments or suggestions?

This is an excellent idea, and should be rolled out to other subjects. It will help improve pass rates. Thank you

Respondent: GM

Questions

Is the concept - or idea - of a "language learning object repository" acceptable to you (teachers)? Why/why not?

The concept of a language learning object repository is acceptable to me as it is:

Easy to gain access to given online connectivity

Easy to share with students (again given online connectivity)

Easy to monitor usage and popularity of the object repository

In your opinion, is it easy to use? Why/why not?

The design is most certainly user friendly- given that the user has knowledge of hyperlinks, and other website basics.

Does it fit with your (or your colleagues') idea of language teaching learning? Why/why not?

Learning a language means familiarizing oneself not only to the rules of the language but embodying the rules, which is made possible via repeated iterations – which is facilitated by the language learning object repository.

Do you think it will be successful and catch on? Why/why not?

I do believe it will be successful and catch on condition the South African schools are provided with enabling infrastructure and school teachers become digitally capable.

Would teachers (or their colleagues) use it now? Why/why not?

Yes, I think teachers will use it now, knowing that:

It's progressive

It's current

It's easy to use

Any other comments or suggestions?

Are the contents of the repository context specific? And changeable?

Respondent: JN

Questions

Is the concept - or idea - of a "language learning object repository" acceptable to you (teachers)? Why/why not?

Yes. It is a fun and interactive way/idea to learn/teach. It takes the boredom out of teaching and learning, especially to ESL learners.

In your opinion, is it easy to use? Why/why not?

Yes. One would require very basic computer skills. Anyway, learners would be interacting with the program on computer, and they are quite adept at using computers.

Does it fit with your (or your colleagues') idea of language teaching learning? Why/why not?

Yes. It would fit in perfectly with language teaching/learning. Teaching ESL learners using this program would be very beneficial and exciting.

Do you think it will be successful and catch on? Why/why not?

Yes. It is interactive and a fun way of teaching and learning. Learners are kept stimulated. Educators do not have to think of ingenious ways of improving learner performance. It is done for them. Interactive teaching resources are available at a click of a button.

Would teachers (or their colleagues) use it now? Why/why not?

Yes. Definitely. For the reasons stated above.

Any other comments or suggestions?

Apart from the minor spelling and grammatical errors, none.

Respondent: PN

Questions

Is the concept - or idea - of a "language learning object repository" acceptable to you (teachers)? Why/why not?

Yes, as a teacher is broadens my teaching ability, and exposes me to current content.

In your opinion, is it easy to use? Why/why not?

Yes, the design was user friendly and allowed for easy navigation.

Does it fit with your (or your colleagues') idea of language teaching learning? Why/ why not?

It has had a positive outcome with the younger generation educators, compared to the older generation whom are set in there ways.

Do you think it will be successful and catch on? Why/why not?

Yes it will be, as more educators are start using the LLOR.

Would teachers (or their colleagues) use it now? Why/why not?
Yes, to keep up with the standards of global education I think most educators would like to the LLOR, this would allow them more exposure.

Any other comments or suggestions?
The LLOR should be experimented in IBE schools as well as government school. Universities like UKZN has changed the language agreement for students (Zulu is a compulsory subject for all first years), if the LLOR could be modified to include Zulu as well, this would ensure an effective and efficient language understanding.

Respondent: RE

Questions

Is the concept - or idea - of a "language learning object repository" acceptable to you (teachers)? Why/why not?
Yes, the concept of using technology to facilitate teaching is a good idea.

In your opinion, is it easy to use? Why/why not?
Yes, it is easy to use. I am experienced with using the internet and this is a familiar environment for me.

Does it fit with your (or your colleagues') idea of language teaching learning? Why/why not?
Maybe. I am not absolutely sure about my colleague's ideas about 'language teaching/learning' and I have never been in a position to make such a call(about using technology such as this) in my current practice, but it is worth exploring.

Do you think it will be successful and catch on? Why/why not?
Maybe. Access to the computers for both my students and I will be a pre-

requisite as with Internet access. Without this it would not even be possible to try it out properly.

Would teachers (or their colleagues) use it now? Why/why not?
Yes/Maybe. This would depend on the previous, if it works for me I can encourage my colleagues to try it out but if not then I won't and they won't use it too.

Any other comments or suggestions?
What would really help is as mentioned before, provision for orientating me (other teachers) and students with guidance from an experienced person and initial access to computers and the Internet.

Respondent: TAM

Questions

Is the concept - or idea - of a "language learning object repository" acceptable to you (teachers)? Why/why not?
Whilst I like the whole idea the problem that I have is that we have a few old computers, and very little reliable Internet connection. Also many of us don't have advanced computer skills and find that the use of computers as teaching tools an area that we still need to explore.

In your opinion, is it easy to use? Why/why not?
Whilst it is easy for me to use others who may not be very knowledgeable in the use of computers may find it difficult to use. Also this is a whole new idea, and needs courses in its use to be offered to us.

Does it fit with your (or your colleagues') idea of language teaching learning? Why/why not?
I think that many of my colleagues would be scared and are reluctant to have

anything to do with computers and teaching using computers and computer-resources such as the repository. Also due to our large class numbers it may be too time-consuming and result in us not spending enough time with individual pupils.

Do you think it will be successful and catch on? Why/why not?

No, it won't work. We are under too much pressure as it is, and will not cope with using this tool in our classes.

Would teachers (or their colleagues) use it now? Why/why not?

No. We are faced with too much change and have become burnt out. As you may be aware we have changed to 2-3 different models (e.g. OBE, CAPS etc.) in the last few years and just cannot take more change. Maybe the new generation of teachers will want to use this as they are more computer savvy.

Any other comments or suggestions?

Whilst I think that this is an excellent idea, it is just too much for us right now. I have classes of 50-60 and if I didn't stand in front of them and teach discipline would go out the window. Maybe when we have smaller classes and better technology we could use this tool.

Appendix D: Letter of Consent

LETTER OF CONSENT

DUT DURBAN UNIVERSITY OF TECHNOLOGY

Dear Participant

Thank you for agreeing to participate in this research study entitled:

A learning object repository for computer assisted language learning in order to provide resources for language learners in schools in KwaZulu-Natal

This study will involve setting up and testing out an online collection of freeware language learning programs for use by teachers and learners.

The researcher undertakes to assure you of the following:

- To maintain your confidentiality;
- To protect your rights and welfare, i.e. to ensure that no harm comes to you as a result of this research;
- No manipulation or withholding of information is involved in this study;
- To present information and transcripts used in this research in such a way as to maintain the participant's dignity and if in doubt to first consult you;
- The participant is free to withdraw from this research process at any time whatsoever if the need should so arise.

I acknowledge your sacrifice in volunteering to add to the body of academic knowledge and your perseverance in carrying out the research task to its completion.

Yours sincerely

Pregalathan Reddy
MTech student

Participant's signature of agreement [redacted] Date: 11/03/2013

PLEASE PRINT NAME: [redacted]

Appendix E: Guide to Accessing CALL-VLC KZN

Open your preferred Internet browser and type the Internet address in the location bar as shown below (this guide uses Internet Explorer 9):

Figure E.1 Internet address of CALL-VLC KZN

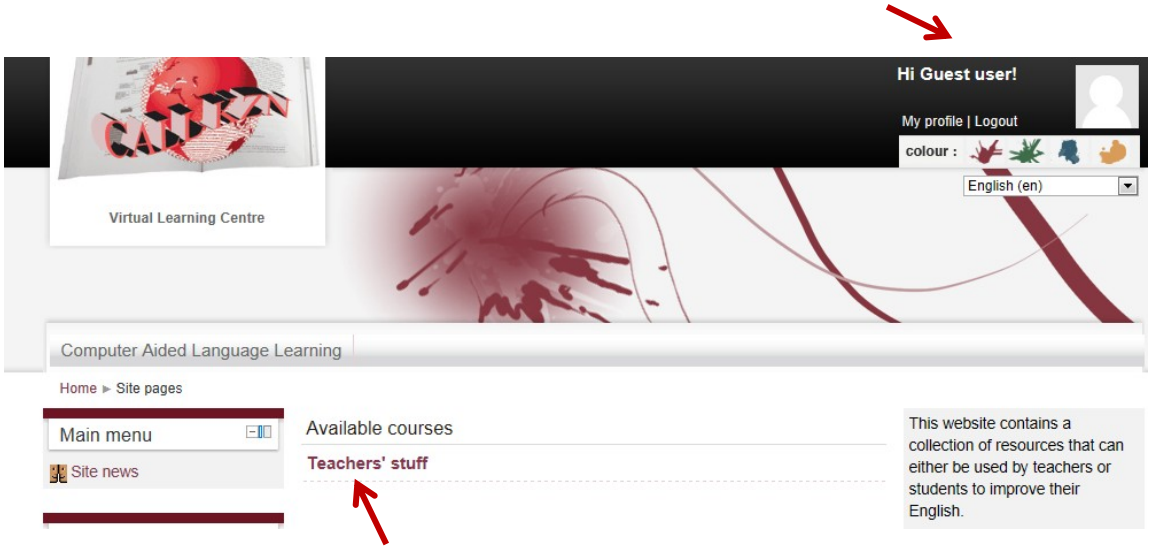

Figure E.2 Link to “Teachers’ stuff”

You will notice on the top right of the browser window the greeting, “Hi Guest user!” and should then click on the link, “Teachers’ stuff” (see Figure E.2).

You will now see three columns, namely, “Navigation”, “Topic outline” and “Search forums” (see Figure E.3). In this guide these have been outlined using the colours “green” for navigation, “yellow” for the topic outline and “blue” for the search forums.

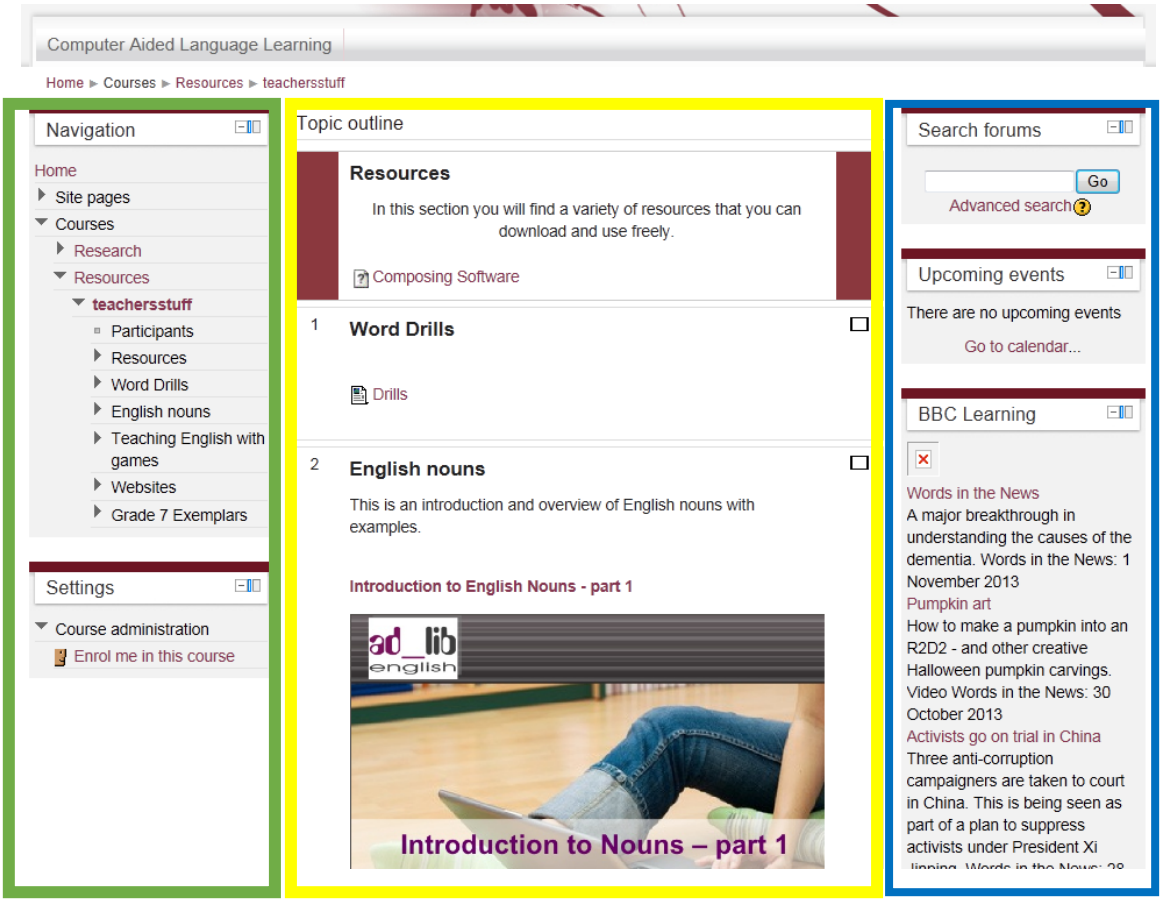

Figure E.3 Layout of language learning resources page

The “Topic outline” would be one of the recommended ways of accessing the content, although you are welcome to use any of the multiple access points available, such as the “Navigation” menu. The pilot version of the CALL-VLC KZN provided five “topics”, namely, resources, word drills, English nouns, Teaching English with games, Websites and Grade 7 Exemplars which can all be accessed as a non-authenticated user (i.e. guest user).

Certain features have been disabled, such as the Enrolment option, and some test features, such as the RSS feeds located in the Search Forum block, have a live feed from the BBC learning part of the BBC website. There will be variations in and limitations to the functioning of this iteration of the CALL-VLC KZN, which will be removed when the next phase of the project has been started.

Generic Moodle related guidance can be found either at http://docs.moodle.org/25/en/Category:FAQ or by starting at https://moodle.org and searching for assistance in the relevant section.

Please contact the author, Preggy Reddy, on email at preggyr@msn.com if you require any other assistance or should an account be required to access more features of the CALL-VLC KZN.

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