

## ZIMBABWE OPEN UNIVERSITY'S BACHELOR OF EDUCATION STUDENTS' ATTITUDES ON THE USE OF ICT IN THEIR STUDIES

Tichaona MAPOLISA  
Zimbabwe Open University  
Faculty of Arts and Education, ZIMBABWE,

Chipo CHIRIMUUTA  
Zimbabwe Open University  
Faculty of Arts and Education, ZIMBABWE

### ABSTRACT

The study sought to examine the Zimbabwe Open University's (ZOU) Bachelor of Educational Management Students' attitudes on the use of ICT in their studies. Qualitative research paradigm anchored the study because of its usefulness of facilitating data gathering from human subjects. It was a case study of five regional centers of the Zimbabwe Open University (ZOU). This case study called for a high level of commitment with research participants whose experiences researchers were trying to investigate. The study could bring to the fore the new knowledge about ODL students' attitudes towards the use of ICT in their studies so that ODL policy makers could take the necessary courses of action to correct situations that let down the quality of education their universities offer. In terms of theory, this study was guided by the critical theory. In their open responses, participants indicated the following issues as themes that portray positive attitudes of the ZOU's Bachelor of student on the use of ICT in their studies.

**Key Words:** Zimbabwe Open University, Educational Management, Students' attitudes,

### INTRODUCTION

This document describes the Zimbabwe Open University's (ZOU) Bachelor of Education (Educational Management) students' attitudes on the use of ICT in their studies. About 60 students participated in the study. First, definition of key terms will be made, and the background to the study. Statement of the problem, research questions and significance of the study shall ensue. In the second part, the related literature review in the form of theoretical framework will be given. The third part will present the research methodology. The third part comprises the results, general conclusions and recommendations.

### Key Terms

The study begins by defining the following key terms:

- Attitudes refer to the degree of value attached to the use of ICT by the ZOU's Bachelor of Education (Education management) undertaking their studies.
- ICT
- Studies denote the courses under taken by the ZOU's Bachelor of Education (Educational Management) students in the Bachelor of Education (Educational Management) Programme during the sixteen semester/four year duration of the programme.

### Background to the study

It is common knowledge that ICT is the in thing in the wake of technological advances as a deliberate drive towards enhancing not 90 not only efficient and effective, but quality learning through Open and distance Education Programmes (Nzepa, 2011). Traditional teaching and learning approaches no longer have a place in

ODL Universities and let above a very fast changing world. Today's world is demanding for not only efficient and effective ways of educating its inhabitants at a much more faster rate than before (Ndlovu, 2009). According to Veltman (2003) there are some dangers that are associated with lack of exposure to ICT by learners. Such dangers include overzealous commercialism, anti-technology among scholars, anti-universal narratives, forgetting the past and more systematic dangers are felt when new users of ICT come face to face with the technology. In Africa, the situation is even worse as evidenced by the lack of adequate capacity to implement and enforce public interest policies, limited participation in global ICT negotiation and inadequate cooperation and coordination at regional levels (Nzepa, 2011:5). The unavailability of telecommunication infrastructure for remote areas to access e-services like the internet (Ndlovu, 2009:2) as well as the pursuance of unrealistic targets that are usually set by information professionals or international institutions, e.g. those related to the United Nation's Millennium Development Goals (MDGs) and poverty reduction strategies also hamper learner access to ICT in Africa (Nzepa, 2011). On the other hand over the past two decades, IT has broadened to become ICT, and has become better established within schools (Abbott, 2001). Many claims have been made about its contribution to pupils' learning (Pachler, 1999) and official rhetoric has presented it as set to transform education (Blair, 1997). Much current policy and practice reflect a technocratic determinism in which technology is seen unproblematic ally as providing relatively immediate tools for teachers and students, and its use as calling primarily for development of technical skills. However, others see successful educational applications of the computer as involving a complex interplay of context, people, activities, machines and available software within settings (Noss and Pachler, 1999; Leach and Moon, 2000). While these findings appear to emphasize that quality and level of ICT resource continue to improve in many schools, they seem not to focus on the attitudes of ODL learners attitudes on the use ICT in their studies. They are also devoid of the andragogical strategies that enhance efficient and effective ODL students' learning capacities. In the light of such observations, the paper explores the ZOU's Bachelor of Education (Educational Management) students' attitudes on the use of ICT in their studies.

### **Statement of the Problem**

While the potential of ICT to revolutionise university teaching and learning has long been celebrated world over, it appears that ODL students at university level in developing nations have some attitudes towards its utility in their studies. It was against this position that this paper sought to critique the following question: What are the attitudes of the ZOU's Bachelor of Education (Educational Management) students' attitudes on the ICT in their studies?

### **Research Questions**

The study was based on the ensuring sub-questions:

- Why do the ZOU's Bachelor of Education (Educational Management) students have positive attitudes towards the use of ICT in their studies?
- Why do some of the ZOU's Bachelor of Education (Educational Management) students have negative attitudes towards the use of ICT in their studies?
- How are ODL students' skills, experiences and attitudes related?
- What opportunities are offered by ICT to ODL students at the ZOU?

### **Significance of the study**

The conduct of this study was important in three ways. First, the study could bring to the fore the new knowledge about ODL students' attitudes towards the use of ICT in their studies so that ODL policy makers could take the necessary courses of action to correct situations that let down the quality of education their universities offer. The paper intended to come up with the degree to which ODL students' skills, experiences and attitudes towards are related in their undertaking of their studies. It sought to unravel opportunities that ICT offers to ODL students hoping to hop the academic ladder of progress.

### Literature Review

In terms of theory, this study was guided by the critical theory. According to critical theorists, adapting a more critical perspective on higher education and technology takes us key and the immediate concerns and preoccupations of most educational technologists. As Monahan (2005:8) puts it, rather than asking do computers work? We are concerned with asking what social relations they produce. The critical theory draws upon three decades of studies of social construction of technology (SCOT) which have sought to document the complex network of competing interests, agendas, and power formations that underlie the seemingly straight forward production of hardware and software for domestic, scientific and business markets (e.g. Russell and Williams, 2002). While the SCOT approach of the Critical Theory puts forward the concerns of educational technologists in conventional learning setting, it is silent on the attitudes of ODL students on the use of ICT in their studies. It was in the interests of this paper to ascertain the degree of such educational technologists' concerns and pre-occupations had a bearing on the ZOU's Bachelor of Education (Educational Management) students' attitudes on the use of ICT in their studies.

This view of technology and education sympathetic to the SCOT approach yet attempts to look beyond the often on owed micro descriptive SCOT accounts of technology and emphasizes the overarching political, economic, cultural, and society which come to bear on any application of technology. By combining these Critical Theory perspectives, we can therefore set out a wider ranging picture of the construction of higher education and ICT by a host of macro-, meso- and micro-level actors which are often unseen in their influence. Only by identifying the full range of these underlying relations and structures can we hope to identify a basic for meaning and sustained change in students' attitudes towards ICT in their studies. It was also in the light of such observations that the present researchers were prompted to investigate the ZOU's Bachelor of Education (Educational Management) students' attitudes on the use of ICT in their studies.

### RESEARCH METHODOLOGY

The present study employed a qualitative research paradigm. Qualitative research permits the researcher to go out into the to study phenomena in its natural settings (Punch, 2004). Also qualitative research was chosen because it enables researchers to gather first hand, rich and meaningful data (Cresswell, 2003). A case study of five regional centers of the ZOU was made use of in carrying out this study. Qualitative case study called for a high level involvement with research participants whose experiences the researchers were trying to investigate.

### Procedures

Qualitative techniques were employed to maintain objectivity. Through the use of this research paradigm, data were gathered using in-depth questionnaires. In-depth questionnaires came in handy in sourcing comprehensive data about phenomenon in question, that is, ZOU's Bachelor of Education (Educational Management) students' attitudes on the use of ICT in their studies (Punch, 2004). Five ZOU's Regional Centres and 60 final year Bachelor of Education (Educational Management) were purposively sampled. Purposive sampling enables the researchers handpick participants who possess research characteristics desired by their study (Punch, 2004). Data were coded, sorted categorized and content analyzed before putting them into themes that emerged from the research findings (Miles and Huberman 1994). Eventually, data were interpreted using participants' direct quotes, analytical narratives and descriptive narratives which were wanted to give the research reader audience a site during the time of the conduct of the study (Thomas and Nelson, 2001).

### DISCUSSION OF FINDINGS

The present study's questionnaire return rate was 100%. This was because the study was carried out at a time when participants were writing their examinations. The discussion/interpretation of data is done in two ways.

- Brief demographic characteristics of the students.

- Actual; research findings drawn from the emerging themes .

#### Demographic Characteristics of participants

Seventy five percent of the participants were male; while 25% were female .The average age of the participants was 45, 5.Fifty-percent of the participants resided in remote rural areas .The average distance of the student's base to the city/town/service centre/growth point was 159 km .Forty percent of the participants indicate d that their rural areas had some access to electricity. All participants were married and had families to look after on top of their extended family dependents Eighty percent of the participants were civil servants, while the rest were self employed.

#### Research Findings

In their open responses, participants indicated the following issues as themes that portray positive attitudes of the ZOU's Bachelor of student on the use of ICT in their studies.

- ICT uses a variety a medical (Multi-media system) ICT can make distant learners to be taught as if they are together with their teachers.
- ICT would enable students and teachers to employ teleconferencing in their teaching and learning episodes.
- Video conferencing
- Internet which enriches both the learner and the tutor.
- Quality enhancement for learner products

What seems to emerge from the above positive attitudes of ZOU's ODL Learners is the fact if the quality of ODL is to improve, then students need to be aware of the benefits of ICT in their studies. Wenger and Por (2006) argue that ICT has become part of, and enjoy the benefits of a community of –practice due to their newly attained social learning activities.

#### Tasks Effected

- Possession of key board skills
- Production of neater and itchier work which was more appealing in its out look.
- Facilitation of written presentations..
- Boost in motivation.
- Reshaping learning.
- Displacement of Teaching.
- Facilitation of e-learning.
- Increased marketability of students in the labour market.
- Increased independent learning

With regards to possible reasons for the ZOU's Bachelor of Education (Educational Management) students' negative attitudes on the use of ICT, the following issues emerged from this study:

- Lack of computer literacy.
- Lack of proficiency in key board skills.
- Cost of compacters and equipment.
- Inadequate access to technologies (data and voice)
- Poor internet connectivity
- Lack of appropriate hardware and software Lack of expertise and equipment
- Poor service delivery
- Lack of electricity facilities
- Age of the students

- Reference to paper –and pencil examination (Leach and Moon, 2000).
  - Anxiety and attitude
  - Lack of e-teachers
  - Lack of political will
  - Lack of e-facilities Digital divides
  - Energy challenges
- Slowness to adapt curricular for e-learning

The challenges to the use of ICT in the promotion of learning in ODL settings are diverse. They vary from one student to another depending on one's locality and economic status.

In connection with how ODL students' skills, experiences and attitudes are related the study came up with the following finding:

- Relationship between ICT and e-learning technologies
- Promotion of access to higher education information
- Facilitation of contact and information exchange
- On-line experiences can boost e-learning
- Promotion of e-leaders
- Access to technology in learning

What is apparent in the above findings is the fact that some ODL students have had more exposure to ICT than others in ODL begins to vary from learner to learner. In that regard, appreciation of ICT begins to vary from learner to learner.

In regard to opportunities that the use of ICT could offer ZOU's Bachelor of Education (Education Management) students in a bid to change their attitudes towards the use of ICT in their studies, the study proffered:

- Facilitating contact and information exchange.
- Promoting access to ODL higher education
- Changing learning processes and out comes
- Different advantages ICT can bring to learning and education as a result of positive perception of ICT.

Interestingly, the findings tend to exhibit an inter-weave of ODL students experiences skills and attitudes on one side and opportunities that ICT could offer ODL students in their learning on the other. Basically, they both appear to zero in on motivation of ODL students to learn. Pachler (1999) rightly notes that ICT orients the learners into the rich world of knowledge.

## DISCUSSION

### Positive Attitudes on the use of ICT

One of the greatest gateways to student's positive attitudes on the use of ICT in their studies that this study's participants indicated was that ICT use multimedia system to benefit ODL learners. In brief it uses a variety of media. This multi media could be used to present information using the ambition of text, sound, pictures, animation of text, sound, pictures, animation and video with the assistance of a computer (O' Brien, 2003). One participant indicated that through ICT, he/she is bound to be motivated to learn more and therefore assimilate better because of the visual appeal. Such a perception is indicative of the positive attitudes that some of the Bachelor of Education (Educational management) students hold regarding the use of ICT in their learning.

Participants also indicated that ICT would reduce the distance between the tutor and the learner. One participant had this to say: ODL world over is turning into e-education and technologically advance to the extent that even students living in the remotest parts of a country or region are now well taught as if they are in a conventional classroom comprising teachers and learners. These sentiments are consistent with Nzepas'

(2011) observations that ICT is capable to take education anywhere to satisfy the needs of the learner. However, the ICT could achieve that noble cause in the presence of the correct ICT infrastructure and equipment.

Positive attitudes of ICT in the learning by ZOU's Bachelor of Education (Educational Management) students were also shown through 12 students shared sentiments about teleconferencing. They pointed out that ICT would go a long way in promoting their Education through teleconferencing as lecturer of the statistics pr Research could tutor one's learners in the comfort of their homes or hostels. In this respect, O' Brien (2003) argues that teleconferencing assists tutors and learners to share common mistakes they usually make about complex concepts. Teleconferencing would enable students and their tutors to polish up their academic social learning skills through their inherent discussions. However, this is obtainable at a cost that could be passed on to the students in the form of fees.

Allied to teleconferencing is video conferencing which students in this study highly regarded. Fifteen participants' exhibited their positive attitude towards ICT by indicating that video conferencing is crucial in practical-oriented courses. As researchers, we feel that it is a very good way to teach learners because of its good visual and audio appeal. Thus, is can be very useful in teaching students to defend their research studies or undertake lessons during Teaching Practice.

The participants' linking of internet in their studies also revealed their positive attitudes towards ICT in their learning. It is common because that internet enriches both the learner and the tutor in terms of knowledge. Pachler (1999) points out that ICT would academically nourish the learner through the internet. In this regard, ODL students would be exposed to current sources of information so that they would not lag behind.

Related to the benefits of internet in ICT is the quality enhancement of the learner products. We feel that the students are being prepared for an ever-changing technological world which therefore demands ODL products that are malleable and durable in meeting labor requirements. In this regard, ICT would increase ODL students' marketability, employability, trainability and promotability.

Learning tasks that could be affected through ICT also reflected positive attitudes of the participants towards ICT in the pursuit of their learning tasks with ease, quickly and reliably, and to a high standard. Most of them pointed out that with the possession of key board skills they were able to produce neater and tidier work which was more appealing in its out look. Also their written presentations were made easier. To underscore this finding, one participant uttered that he/she was now able to present a research report with user-friendly handwriting. Furthermore, ICT was found to assist students save time in performing mathematical and statistical consumptions.

#### **Negative Attitudes on the use of ICT**

Lack of computer literacy among ODL students was perceived as one of the causes of participants' negative attitudes towards ICT in their learning. While the participants indicated their willingness to use ICT in their studies, they revealed that their lack of computer literacy would work against the effectiveness of ICT in their learning. These findings tend to go hand in hand with lack of e-tutors. It is the present researchers' belief that effective ODL teaching that draws positive attention from learners is only possible if ODL institutions employ teachers who are technically competent in the modern educational technologies of e-education. These findings tend to compare favorably with Blair (1997) who observed; some students tend to be devoid of functional literacy and knowledge in ICT such that their learning may be negatively impacted upon.

Lack of proficiency in key board skills was also perceived as one of the drivers of the participants' negative attitudes towards ICT in their studies. One participant voiced his/ her concern by indicating that if I were to present a research project I would have typed myself it would be a delight, but I am hampered by lack of

proficiency in key board skills. Perhaps that could be one of the reasons why some participants have like warm attitudes towards ICT in their studies.

Lots of computers and equipment constitute some of the negative attitudes that participant have on ICT in their learning Gwisai (2006) argues that the costs of computers are deterrent to upcoming learners and academics. This is echoed by one participant who said: "I only manage to turn on my back and weep". The issue of cost of computers also works hand in hand with inadequate access to technology. Most participants happen to be civil servants who are well paid such that they struggle meet the costs of accessing technologies. Under such circumstances, they resort to the lukewarm attitudes towards ICT in their studies.

Poor internet connectivity coupled with lack of appropriate hardware and software, and lack of expertise and equipment appeared to be some of the possible causes of participant's negative attitudes towards ICT in their learning. These also constitute lack of e-facilities such as computers (soft and hardware, internet, Broadband, Satellite links, Cabling, Digital Phones and any other information Technology facilities). All these factors seem to be expensive on the part of ODL students.

Poor service delivery's lack of electricity facilities, age of students, preference paper and pencil examination and anxiety and attitude were also viewed as possible fuellers to the participants' negative attitudes towards ICT in their learning. One senior participant revealed that he/ she was born before technology. This finding is in tandem with another funding of this study centered on digital divides which revealed that e-learning is very clear because in the absents a conducive environment to reduce the cost of acquiring computer and other modern educational facilities, many would be students will be left out. They however, were unable to electrify their houses so that they would purchase lap tops. Lack of conscious drive towards adapting curricular for ICT-compliant ODL tends to discourage learners from considering ICT as one of their passports to success in their students. In the absence of a specially written e-learning curriculum, the normal curriculum will not yield the desired outcomes (Nzepa, 2011)

#### **How ODL Student's Skills, Experience and Attitudes Are Relate**

The results indicate that the students who possessed the higher ability to use ICT and had more experience with e-learning tend to be more positive about the advantages. ICT could bring to their studies. This may mean that in order to encourage students to accept working with ICT in their university curricular it is important to develop their ICT skills, and to provide them with the mans to gain experience with e-learning through the learning of a virtual environment or through academic support and advice from the teacher by e-mail (Deaney et al, 2003). This would assist in cultivating positive attitudes of ICT in the ODL students.

The study found out those students who had literacy and experience in ICT had great access to higher education information. Such students tended to do well in their assignments and research work because of the rich information within their reach. Under such a scenario, ODL students are bound to possess positive attitudes towards their ICT in their studies. This is because ICT promotes access to the homology in learning (Business Wire. 2001)

ICT is also applauded for its promotion of e-readiness. E-readiness, according to Bantick (2004) is all about independent learning. This is vividly demonstrated by one participant who pointed out that "When I learn on my own using ICT, I don't think it can be a problem as already I possess some knowledge."

This view largely rules out the belief that all ODL learners lack ICT skills. Some join ZOU with good or even polished ICT skills which only need to be put to very good use for the academic growth of the students. Abbot (2001) reports that increased computer use exacerbates independent learning practices. By the time the ZOU students complete their degree they would be able to type, read instructions from monitors, interact with e-mail messages and respond to academic information by way of assignments and research. Therefore, participants' prior experiences with ICT contribute to the nature of their attitudes towards ICT in their studies.



### Opportunities that ICT offers to ODL learners

Participants gave almost similar responses for opportunities that ICT offers to or learners to those that relate their ICT skills, experience and attitudes. They hailed ICT for its ability to facilitate contact and information exchange. They indicated that this is possible through teleconferencing, videoconferencing, internet and instructional television. Instructional television would permit students to interact with two-way audio to with a live instructor or a fellow participating student site. Teleconferencing can be done through the internet. Video conferencing is a computer teaching technology which uses moving pictures to permit students to see and hear the tutor in other place, and the converse is true. Once these experimental tools are in place, there is no doubt that students' attitudes towards ICT would change in the right direct and so would better learn processes and outcomes.

### CONCLUSIONS

Basing on the above findings the study makes the following conclusions:

- In regard the study shows that the participants realize that ICT is indispensable in their studies even though some of them have negative attitudes on the use of ICT in their studies for personal reasons.
- Use of ICT in ODL learner tends to offer more advantages than disadvantages to the student.
- Provision of ICT to ODL learners would result in producing more polished products in the areas of research in a knowledge-economy like Zimbabwe.
- Exposure of ODL students to varied forms of IC would make them complete with conventional students on the same footing in the world of work and academics. At times, the ODL product will be more saleable because of his/ her exposure to the marriage of theory with practice.
- The right experiences and skills in ICT are bound to conceive positive attitudes towards ICT in the participants' pursuance of studies.
- Provision of ICT in ODL is subject to socio-economic-political circumstances.
- Opportunities for ICT in ODL to flourish are dependent on the students' attitudes towards ICT in their learning.

### RECOMMENDATIONS

In the light of the Proceeding findings and conclusions the study makes these recommendations:

- The Department of Education of ZOU needs to review and re-brand its course on Computers so that it becomes compliant with the ever dynamic and demanding changes of the both the labor and academic worlds.
- ZOU needs to upgrade ICT faculties and systems at the Departments into compatible mode.
- ZOU needs to implement the Mobile learning so that the students can reach them even when they are travelling. This would foster a culture of positive attitudes towards ICT in the participants.
- ZOU needs to reveal its curricular so that it is compatible with e-learning. This would give the ODL students the right learning experiences which will ultimately result in the positive students' attitudes towards ICT in their studies.
- ZOU needs to collaborate with the stakeholders such as the Government, business world, donors and alumni to set a first class ICT structure that will make students' self-persuade to exhibit positive attitudes towards ICT in their studies.
- This study could be extended to other Departments and Faculties using Virtual students or even other ODL regional experiences in the same area for compatibility's sake.



#### BIODATA AND CONTACT ADRESSES OF AUTHORS



**Tichaona MAPOLISA** is a senior lecturer and National Programme Leader for the Bachelor of Education (Educational Management) in the Department of Educational Studies, Faculty of Arts and Education at the Zimbabwe Open University (ZOU). He has published two research articles with refereed journal of the African Symposium. He co-authored seven modules for the Department of Education, Development Studies and Youth Studies in Development.

Tichaona MAPOLISA  
Zimbabwe Open University PO Box MP1119 Mount Pleasant, Harare  
E. Mail: [tichmapolisa@yahoo.co.uk](mailto:tichmapolisa@yahoo.co.uk) or [tichmap@gmail.com](mailto:tichmap@gmail.com)  
Cell: +263 733 608 577



**Chipso CHIRIMUUTA** is a lecturer and National Programme Leader in the Language and Media Department, Faculty of Arts and Education at the Zimbabwe Open University (ZOU). She has written articles on gender; the new information technology and the Zimbabwean local languages, HIV and AIDS, and indigenous knowledge systems.

Zimbabwe Open University PO Box MP1119 Mount Pleasant, Harare  
E. Mail: [chirimuutac@mail.com](mailto:chirimuutac@mail.com)  
Cell: + 263 734 533 997

#### REFERENCES

- Abbot, C. (2001). *ICT: Changing Education*. London: Routledge.
- Bantock, T. (2004). Optimising outsourced supply chains using service level agreements. *Logistics News*, 5-7.
- Blair, T. (1997). Connecting a Learning Society. <http://www.becta.org.uk/start/agfl.html>
- Business Wire. 2001. Seven systems determine an organization's readiness for e-learning, top frontline exec astd conference. *Business Wire*, 2547.
- Deaney, R.; Ruthven, K. and Hennessey, P. Pupil Perspectives on the Contribution of Information Technology to Teaching and Learning in the Secondary School in the *Research Papers in Education*, 2003, 18(2), 141-165
- Gall, M. D. and Borg, W. R. (1996). *Educational Research: An Introduction*. Longman: New York.
- Gwisai, M. (2006). *Labour and Employment Laws in Zimbabwe: Labour Centre and Institute of Commercial Law*. Harare: University of Zimbabwe.
- Leach, J. and Moon, B. (2000). Pedagogy, information and communications technology and teachers' professional knowledge. *The Curriculum Journal*, 11, 3, 385-404.
- Miles and Huberman, A. M. (1994). *Qualitative Data Analysis*. California: Thousand Oaks.

Ndlovu, R. (2009). ICT Guide-Zimbabwe. an Jose:USA.

Noss, R. and Pachler, N. (1999). "The Challenge of New Technologies: Doing Old Things in a New Way, Doing New Things?" In P. Mortimore (Ed) *Understanding Pedagogy and its Impact on Learning*. London: Paul Chapman.

Nzepa, O.N. (2011). *Challenges for Africa's Learning and Knowledge Institutions in a Global Market*. A Paper Presented at GKP Africa Regional Meeting 5-6 June 2007.

O'Brien, J.A. (2003). *Introduction to Information Systems: Essentials for the E-Business Enterprise* (11 Edition). McGraw-Hill Higher Education: New York.

Pachler, N. (1999). Theories of Learning and ICT. In M. Leask and N. Pachler (Eds). *Learning to Teach using ICT in the Secondary School*. London: Routledge.

Punch. K.F. (2004). *Introduction to Social to Social Research. Quantitative and Qualitative Approaches*. London: Sage.

Thomas, J.R. and Nelson, J. (2001). *Research Methods in Physical Activity*. Amazon.com.uk.

Veltman, K.H. (2003). Challenges for Information and Communication Technology (ICT) Applications in Cultural Heritage in the Next Decade(s) Published in Boltein PH, Instituto Andaluz del Patrimonio Historico, Seville, December 2003 (in press).

Wenger, E. and G. Por. 2006. Communities of practice and community-enabled strategic results from self-organisation: International executive workshop. [Http://www.co-i-l.com/coi/knowledge-garden/cop/index.shtml](http://www.co-i-l.com/coi/knowledge-garden/cop/index.shtml) (accessed 2 May 2006).