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List of acronyms and abbreviations

ABET	Adult Basic Education and Training
AET	Adult Education and Training
AT	Activity Theory
BBT	"Borns-before-technology"
CSOs	Civil Society Organisations
D&M	DeLone & McLean
DHET	Department of Higher Education and Training
DME	Department of Minerals and Energy
DoE	Department of Education
ETDP	Education, Training and Development Practices
FLC	Foundation Learner Competency
HEI	Higher Education Institutions
HR	Human Resources
HRD	Human Resource Development
ICT	Information and Communication Technologies
IEB	Independent Examination Board
IS	Information System
LAN	Local Area Network
LIMS	Learning Intervention Management System
LPCAT	Learning Potential Computerised Adaptive Test
MEd	Master in Education
MQA	Mining Qualifications Authority
NCREL	North Central Regional Educational Laboratory

NQF	National Qualifications Framework
PSET	Post-School Education and Training
ROI	Return on Investment
SACABE	South African Committee for Adult Basic Education
SADC	Southern African Development Community
SAQA	South African Qualifications Authority
SLA	Service Level Agreement
UMALUSI	Council for Quality Assurance in General and Further Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization
ZPD	Zone of Proximal Development

CHAPTER 1
INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

The use of the acronym ABET for Adult Basic Education and Training is uniquely South African. It refers to the provision for adult literacy and includes numeracy and English language and communication skills (Mining Qualifications Authority [MQA], 2008:168). The intention with ABET is to compensate those who were deprived of part or all the education they normally would have received during the period of compulsory schooling.

The Department of Higher Education and Training (DHET) has recently adopted a shift from ABET to Adult Education and Training (AET), as proposed by the Ministerial Committee on Adult Education (DoE, 2007), with a view to align the adult education policy and practice with international trends, which locate adult education within a lifelong learning framework. The definitions of the ABET Act of 2002 were subsequently amended, and the title changed from ABET to AET, which is now the official term referring to adult education.

According to DHET (2012), this shift signifies an orientation towards adult learning that recognises all forms of adult learning, be they formal, informal or non-formal. AET focuses on all forms of learning up and equivalent to Grade 12 (DHET, 2012). Mine health and safety and AET programmes appear to have much in common, especially in terms of the socio-demographics of the target learners. Many target learners are relatively poor migrant workers who have had limited or no formal education. A lack of education is invariably evident among mine workers working underground, because underground mining provides employment to those who lack the formal education to seek other, less physically demanding, opportunities.

The study focused specifically on those mine workers with the least formal education or training, termed elementary workers (unskilled), and machinery operators and drivers (semi-skilled). These mine workers are enrolled in AET classes from basic oral to Foundation Learner Competency

(FLC), which equates to NQF 1. They are introduced to AET programmes powered by Media Works.

The particular mine, in the North-West Province chosen for this study has a service-level agreement (SLA) with Media Works, a South African company established in 1996. Media Works offers computer-based and face-to-face training methodologies, as well as the combination of the two at this mine. Accelerate is the platform used by Media Works that provides the facilitators with what is required to present an outcomes-based lesson through Navigate, a learning intervention management system (LIMS) used to track learners' work and manage aspects of the learning intervention. The computer programme has an in-built tutor that communicates in English to give learning instructions on a course, and learners follow the voice prompts to do as instructed. This mode of teaching improves their spoken language while at the same time they acquire listening, mouse and keyboard skills. If they do not understand, facilitators are there to explain and give more meaning.

Media Works' computer-based learning option uses a combination of time on the computer, activities in the workbook, and interaction with the facilitator. Each AET centre at the mine has a computer lab, which is accessible to learners during the day and is installed with computer programmes offered by Media Works to enhance what the learners have learned during face-to-face sessions through computers. AET centres comprise a manager, who is a permanent mine employee, and facilitators who are employed by Media Works. Although Media Works is the company contracted by the mine to deliver AET outcomes-based lessons, there is a need to evaluate their programmes to determine whether and how the content developed for face-to-face and computer-based learning provides adult learners with the necessary life skills and knowledge to improve their performance at work.

The Green Paper on AET (Department of Education [DoE], 2007) recognises adult learning as a vehicle that plays an important role in providing adults the opportunity to transform their living conditions; contribute towards the development of citizenship and democracy; and develop the skills required in both informal and formal sectors of the economy. It aims to provide adults with

cultural and political education essential for active participation in cultural organisations, social movements, political parties and trade unions (Department of Education [DoE], 2008).

The purpose of this qualitative case study was to evaluate the AET computer-based programme used for teaching and learning in the particular mine in North-West Province. Two different learning environments were experienced, namely AET Full-Time and AET Own-Time or Part-Time. It was therefore necessary to consider the characteristics of each of the two environments separately. The quest of the mine is to eradicate illiteracy and innumeracy in its operations through the introduction of AET studies for Full-Time and Own-Time learners. The AET programme introduced at the mine has a combination of two teaching methodologies, i.e. computer-based learning and face-to-face teaching, as well as a combination of the two teaching methodologies. The expectation is that after the completion of the AET programmes learners will have acquired skills that include but are not limited to reading, listening, pronunciation, writing, data handling, working with numbers, calculating, differentiating patterns, and algebra in different contexts and be able to apply concepts of shape, space, and measurement to make decisions relative to the world. Furthermore, they will have gained the knowledge to store, analyse and interpret data, utilising computer software and hardware for learning. Therefore, AET at this mine is provided in line with the South African Qualifications Authority (SAQA), the Council for Quality Assurance in General and Further Education and Training (UMALUSI), and the Mining Qualifications Authority (MQA) guidelines.

According to Birenbaum (1999:201) and Reeves and Laffey (1999), computer technology can support the constructivists' learning environment, for it enables the creation of situated learning contexts, communication channels, group work and learner control. In this Knowledge Age or innovation-driven age, the skills required for existence in the connected world of global markets, knowledge, and tele-linked citizens are very different from what they were before (Trilling & Fadel, 2009). Computer technology in the workplace has led to the automation of many job tasks that humans once performed manually, primarily "routine" tasks that require following directions – something computers can do faster, better, and more cheaply than humans. At the same time, human workers are increasingly called on to tackle tasks that computers cannot (yet) handle,

particularly those which require solving unpredictable problems and interacting with other humans (Levy & Murnane, 1996).

The content of this AET programme consists of computer-based applications, provided by Media Works, which are technologies that are used for instruction in a classroom environment. These technologies incorporate elements that are considered essential in the early teaching of English as a Second Language and Numeracy to indicate the timeline when events occurred to help learners acquire the competencies for the use of the language and numeracy. When learners become familiar with and confident in pronouncing and typing a variety of words in the appropriate grammatical context, they acquire self-efficacy.

1.2 BACKGROUND TO THE STUDY

Mining in South Africa dates back to the 19th century when diamonds were discovered for the first time on the banks of the Orange River in 1867 and subsequently in Kimberly (Terreblanche, 2002). The discovery and subsequent exploration led to the expansion of the mining industry in South Africa. This industry expanded further northeast of Kimberly when gold was discovered in what become known as the Witwatersrand – where Johannesburg city and other towns such as Brakpan, Carletonville, Germiston, and Springs were later established. The mining industry expanded with the discovery of gold in other areas of the country such as Orkney, Stilfontein, Virginia and Welkom. Other minerals such as copper were discovered in Phalaborwa and platinum in the Rustenburg area.

Most mine workers, especially blacks who were employed to work underground, were illiterate and innumerate. That is, formal education and/or qualifications were not a prerequisite for their employment in the mines. The focus in all the mines was on mining and not the well-being, such as the education, of the mine workers – especially the blacks. Although the mining industry expanded in South Africa, black mine workers were denied formal education – especially during the apartheid era (Smith & Mji, 2012). The provision of literacy and numeracy classes (which later came to be called Adult Basic Education and Training or ABET classes) to adult mine workers commenced fully only after the dawn of democracy in South Africa in 1994.

Golding (1996), cited by Smith and Mji, (2012), mentions that in 1996 almost 80% of mine workers had not passed Grade 7 and were thus functionally illiterate and innumerate. This scenario was changed by the adoption of the Constitution of South Africa of 1996, which endorses access to and equality in education irrespective of age, colour, culture or gender. All the established mines provided their employees with resources such as education focused on literacy and numeracy, health facilities, and residential areas (Education Training and Development Practices [ETDP], 2000). For example, 12 731 (2.6%) mine employees were, according to the Mining Qualifications Authority (MQA, 2008), registered for literacy and numeracy classes as early as 2007. Although the pace of transforming mines in this respect is slow, it remains one of the many plans of mines to fast-track and promote capable workers who are illiterate and innumerate and who sincerely want a chance to acquire formal education and other skills such as computer integrated skills by means of such opportunities.

The primary aim of the mine that was the subject of this study, therefore, was to address illiteracy and innumeracy by introducing AET to employees, contractors, and community members who were regarded as functionally illiterate and giving them the opportunity to acquire basic literacy, numeracy and other relevant skills for the sector (South African Committee for Adult Basic Education, 1994). Against the background of the marginality of adult literacy education in this mine, situated in the North-West Province, is that computers are allegedly not used extensively to impart literacy skills to adult learners in the Full-Time learning environment, as will be discussed at length in the findings of this study. The participants in this case study enrolled for AET Level 3 were functionally literate, which hypothetically means they were able to read and write, though not proficiently, and do mathematical calculations, e.g. adding and subtracting, which formed part of the curricula of the preceding levels they had completed in Basic Oral or Pre-AET, AET Level 1 and AET Level 2. Thus, in this study they were referred to as functionally literate. However, there are still workers in the mine who work underground and are not enrolled in the AET programme and who are regarded as illiterate and innumerate.

This study required me as the researcher to achieve what Jones (1997) cited by Motaung (2008) refers to as "*Verstehen*", or empathetic understanding of the participants. I intended to explore and try to comprehend how the participants could be uplifted by integrating computer-based skills in

their day-to-day work. A qualitative approach was followed in this study. This is an essential dimension of the study since in my role as researcher I wanted to understand how participants viewed the situation they found themselves in, for instance by attending Part-Time and Full-Time AET classes. I was aware of Tarasiuk's (2010:544) contention that the "technology that students are involved with outside of school provides processes of learning that are deeper and richer than the forms of learning to which they are exposed in schools".

This study was undertaken within a broad AET context in the chosen mine in the North-West Province. Inevitably, the study was influenced in its orientation, values and use of language by the few years I spent as a line manager in the mine's Transformation Department. My own experience also affected my approach to the study. As a Line Manager for Transformation, I worked closely with the Human Resource Department (HRD) Managers, since AET forms part of HRD in the chosen mine. I was motivated by the mine's efforts to recruit its employees for Own-Time and Full-Time classes to redress the inequalities of the past. The doors of learning are open to all the employees. Learners assume responsibility for driving their own development by attending classes and participating fully in pursuit of a qualification.

Collaborative learning and learner support guided this study. I was interested in the move from E-learning to M-learning, i.e. learning across multiple contexts, through podcast, via a computer or mobile device to teach AET Level 3 for the adult mine workers. The reason many people come to work in the mining industry is that mines invest in their people, and they do it in a way that not merely builds their business but also helps them grow personally. It follows that training and developing talent is a crucial responsibility. Courses are offered across a range of employees to ensure that appropriate skills and content offerings are mapped. In this study, one group at the mine was identified for scrutiny, namely AET Level 3 Own-Time and Full-Time learners.

1.2.1 AET proficiency for the mine in North-West Province

Adult learners attend AET classes Full-Time on site at a designated learning centre from 07:00 to 16:00 daily. There are five AET levels and learners are supposed to obtain a qualification for one level after approximately four to six months before moving to the next level, depending on the learners' potential and ability. Through the recognition of prior learning, the learners are assessed

for placement at the appropriate level. Competency standards are set by the Independent Examination Board (IEB). Classes start from mother-tongue "Basic Oral" to FLC. The one category above is that of AET 4 or NQF Level 1. In terms of this category, the NQF Level 1 qualification provided for under the auspices of the MQA has been tentatively phased out in Own-Time. However, Full-Time classes continue, therefore there were no targets set for this level in the mine's social and labour plan. A learner can do Foundational Learning Competency (FLC) after completing AET Level 3. This route helps the learner towards acquiring technical skills. It also enables the learner to pursue fields in Further Education and Training (FET) colleges.

The above-mentioned levels are divided into Own-Time / Part-Time and Full-Time. Admission to AET Full-Time is by nomination. The issue of remuneration is taken into consideration when employees are nominated for Full-Time classes as they should not be disadvantaged or lose their benefits. On the other hand, AET Own-Time is open to all and classes are held outside working hours. Classes are held for two hours four times a week in the morning, at midday and in the afternoon.

1.2.2 Full-Time AET plan

The Full-Time AET plan refers to the arrangement in which the employee is relieved of his or her normal duties and attends AET classes on a full-time basis. The following action steps enable the mine to achieve the AET full-time targets:

- All production areas have been tasked to nominate potential learners. These employees first go through the RPL (recognition of prior learning) assessment before being placed into Full-Time AET.
- The Education Department from the mine provides training for AET Basic Oral and above.
- Employees who are highly trainable are, together with "high flyers", identified from the Own-Time programme, and are offered the opportunity to enrol for Full-Time classes. These employees could be fast-tracked into supervisory positions through the capacity pool and talent pool, which exist in the mine as a form of career progression.

1.2.3 Own/Part-Time AET plan

Unlike Full-Time AET, Own or Part-Time AET refers to the arrangement in which the learner attends ABET classes in his or her own time. The following action steps have been undertaken to enable the mine to achieve the Own-Time AET targets:

- AET centres have the capacity to provide three training sessions per day for Own-Time training;
- Budgets are prepared and aligned to meet the mine's Own-Time targets;
- There are ten computers at each AET centre for use by the learners.

As part of the above targets, therefore, the mine's plan was to train the miners through the computer-based programme in order to operate effectively in the context of the information age and automation of things. Pink (2005:33) asserts that we are "moving from the Information Age to the Conceptual Age". He argues that the workplace is changing because of three factors, namely abundance, automation, and the need of competitive workers for new skills (Pink, 2005:46). The conceptual age focuses on two macro components: high concept and high touch. The conceptual age at this mine is experienced sufficiently with evidence during teaching and learning in Own-Time mostly. The new workers' personal goals and motivations through the use of computers for learning imply that upon completion of this programme, workers will have a whole new mindset, and new ways of thinking and doing things, such as working smarter in underground jobs and not harder, than could have been the case prior to acquiring knowledge and skills through the use of computers. This is in line with Pink's (2005:51) explanation that "in the Conceptual Age, what we need is a *whole* new mind – one that incorporates both right brain and left brain directed aptitudes. That is, the left brain is 'sequential, logical, and analytical', while the right brain is 'nonlinear, intuitive, and holistic'".

Pink (2005:3) notes that while the "defining skills of the previous era are necessary", they are "no longer sufficient". Instead, he argues, the "right brain qualities of inventiveness, empathy, joyfulness, and meaning increasingly will determine who flourishes and who flounders". As the workplace changes and evolves, so must its workers if they are to become successful in their

personal and professional lives (North Central Regional Educational Laboratory [NCREL] & Metiri Group, 2003).

The Green Paper for Post-School Education and Training (PSET), like previous documents such as the Ministerial Report on Adult Education and Training (Department of Education [DoE], 2007), recognises the enormous demand for improved national adult education and proposes a significant increase in the uptake of adults and the youth in programmes that address their particular needs. For this reason, the Green Paper proposes a substantial uptake of adults and youth into adult education and training programmes (Department of Higher Education and Training [DHET], 2012). These programmes are intended as ancillary to Mine Health and Safety training, which usually has a more specific purpose, i.e. to develop health and safety efficacy of workers within a defined mining situation or task, regardless of the workers' levels of formal or certificated education.

The Green Paper on AET (Department of Education [DoE], 2007) also foregrounds adult learning as a vehicle that plays an important role in the chances of women and men to transform their living conditions; to contribute to the development of citizenship and democracy; and to develop the skills required in both informal and formal sectors of the economy. (Department of Education [DoE], 2008).

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 1997:18),

> *Adult basic education can be thought of as all forms of organized education and training, including literacy instruction, that meet the basic learning needs of adults. ... Technically, the term "literacy" refers to reading and writing skills, but many adult literacy programmes today are organized around broader aims and content than just literacy and numeracy. The term is sometimes used also with reference to various other kinds of basic knowledge and skills~ such as "scientific literacy", "computer literacy" and "political literacy".*

1.3 PROBLEM STATEMENT AND RESEARCH QUESTIONS

The largest technological force now shaping the world of work is the computer (Thorn, 2009:102). The industrialised nature of mining activities and production requires engaging computer-driven education, especially in the training of mine workers. The identified mine in this study has introduced a computer-based programme through a Media Works service provider, targeting its illiterate and innumerate employees as well as advancing the functionally literate and numerate employees for the mines' retention strategy. However, the impact of a computer-based learning environment has not been extensively investigated (how it can or cannot benefit mine workers, their self-efficacy and performance at work). According to the Oxford Dictionary (2005), the word 'impact' means "the action of one object coming forcibly into contact with another, a marked effect or influence". This definition was helpful in this study as my interest was on the implied effect, the *impact* that the programme might have produced in the literacy and numeracy knowledge and skills of the mine workers.

The way in which the word *impact* is interpreted in this study has a significant bearing on the evaluation of the developmental processes of mine workers and the computer-based learning programme designed for AET. This study aligns itself with the broad definition of the word, which describes it as flexible to accommodate all types of development programmes, as explained by Hearn and Buffardi (2016:8). Rather than identifying the cause of an effect, this definition considers all possible effects of a cause, that is, the multiple effects of a programme or intervention. Hearn and Buffardi (2016:10) define *impact* through six varying characteristics aligned to the study as follows:

1. Intended: These are foreseen planned programme goals, e.g. to develop and empower workers with skills, knowledge and attitudes to eradicate illiteracy and innumeracy in the workforce.
2. Positive unintended: These characteristics are foreseen and may predict spill-over effects, e.g. there is one policy for AET which speaks volumes about the Full-Time learners and nothing similar about Own-Time learning because it is regarded as voluntary.

3. Negative unintended: These are foreseen characteristics that predict a risk or a side-effect for learners, e.g. workers receive better, more lucrative job offers from other mining companies or are transferred to other business operations because of operational requirements. When this happens, workers lose the opportunity of completing their studies.
4. Emergent programme: These are unforeseen goals, e.g. during the training of learners the programme will realise the importance of integrating computers for learning and not relying on face-to-face alone.
5. Nice surprise: These are unforeseen characteristics, e.g. former AET learners from the programme start to spread the good word about AET and its benefits at the mine at every clocking centre, during meetings and in halls. The former learners motivate other workers to enrol in AET studies.
6. Calamity, mishap or backslash: This characteristic is unforeseen, e.g. how will making attendance at Own-Time voluntary have a negative impact in attending studies? Are ten computers at each computer lab sufficient for the number of learners registered in this programme?

My concern in this study was also whether the content developed for face-to-face and computer-based learning provided the learners with the skills necessary to improve their lives in general and their performance at work. Evaluation is necessary to ensure on-going relevance, coherence, balance, and progression within a curriculum (Rossi, Lipsey & Freeman, 2004:119). Furthermore, the evaluation process provides an evidence base for subsequent judgement and decision making on curriculum development and revision (Rossi, et al., 2004:124). It safeguards that varied viewpoints are considered and that results are not biased. Facilitators, learners, and centre managers were considered for providing inputs regarding the AET computer-based programme. The computer-based programme combines training in basic numerical cognition with training in arithmetical abilities and English communication. Formative and summative evaluations are used for this study.

The purpose of evaluation is to:

- achieve curriculum outcomes;
- ensure adequate allocation of teaching and learning resources;
- ascertain that the programme meets the learners' needs;
- identify areas in the programme which need modification and give feedback where necessary; and
- The main purpose of the evaluation was to focus on the process of implementation.

Thus, the unknown impact of the computer programme used for learners prompted this study. The aim was to investigate whether the AET programme meets its intended objectives, and justifies the time and money spent by the mining company, and whether the programme is successful in developing and empowering the mine's employees. The three commonly used words in the case study that explain the literacy status of the workforce are "illiteracy, innumeracy and functional literacy". In the context of this study, the words are defined as follows:

- Illiteracy is the quality or state of being unable to read and write;
- Innumeracy is the state of being unfamiliar with mathematical concepts and methods; and
- Functional literacy is the state of being able to read and write, and being familiar with the mathematical concepts and methods on a limited scale.

It is against this background that the primary research question in this study was formulated as follows: *What is the impact of the computer-based programme on the mine workers who have undergone this training at the North-West Province mine?* This primary research question led to the following sub-questions:

- How can the mine workers practically apply the knowledge and skills that they have acquired from the computer-based AET programme in their work environment by:
  - showing understanding of written English through examining operational reports, and deviation reports of events?
  - verbally communicating in English with their supervisor and their fellow workers?

- reading their payslips, their time-sheets, memos and notices sent via the e-mails and interpreting them?
- doing basic mathematical or numerical calculations related to their duties using the computer?

1.4 AIM AND RESEARCH OBJECTIVES

Consistent with the research questions above, the aim of this study was to evaluate the impact of AET computer-based programmes at the North-West Province mine (i.e. in the workplace). The following objectives served as a guide to achieving this aim:

- To establish how the impact of the computer-based AET programme or training on the mine workers' can assist them to practically apply the knowledge and skills which they have acquired by:
  - showing understanding of written English through examining operational reports, and deviation reports of events;
  - verbally communicating in English with their supervisor and their fellow workers;
  - reading their payslips, their time-sheets, memos and notices sent via the e-mails and interpreting them; and
  - doing basic mathematical calculations related to their duties.

1.5 ASSUMPTIONS

I embarked on this project with numerous preconceived ideas about the context of the study. I expected that facilitators and learners would rely mostly on face-to-face teaching and learning and would not have time to integrate computers in learning due to revelations that will be made in the findings in Chapter 4. Further assumptions were that adult learners would not be able to use the computer for learning proficiently at Level 3 of AET; that learning through the medium of English as a second language would be a challenge and that facilitators would use the mother tongue all the time for emphasising meaning; that the learners would not be able to read, write and speak English proficiently with their facilitators in class, and interpret the meaning of words without

assistance. I therefore assumed that learning at Level 3 would be teacher-centred. On the other hand, I expected that the mine, in an industry producing sought-after minerals globally, would have trendy state-of-the-art computers with high performance for learning and well-equipped computer labs. Also, I expected that those computers would accommodate all the learners registered in this programme, and that teaching and learning would be delivered via the computer all the time.

1.6 MOTIVATION OF THE STUDY

This study was influenced by the genuine desire of the mine in question to improve the professional and personal lives of their workforce. The mine had failed to meet industry targets because of mine accidents underground. I believed that the illiteracy challenges of the workers were key to solving this problem. This prompted me to seek understanding of the computer-based programme that the mine had introduced to assist in addressing this problem. This study is therefore important because there is a dire need to find out whether the computer-based programme yields the intended outcomes and benefits to the mine and its targeted employees. This study will help the mine to gain knowledge about the success of the programme to inform the mine's decisions going forward. It is important that programmes have the monitoring and evaluation systems for purposes of improving on them. Furthermore, it is important for the mine to provide personal empowerment programmes for its employees. It is necessary, however, to ascertain whether such programmes succeed in doing this.

1.7 AN OVERVIEW OF THE THEORETICAL FRAMEWORK

Activity theory (AT) was chosen for the study. AT is a tool mediation to enable the researcher to analyse human practices or "what people do" in context by means of tools and the concept of an activity system in which the relationship between the components can be explored (Cole, 1999:90). The reason for incorporating AT in this study is that it offered a tool that could be used to design and evaluate technology-enhanced learning interventions. Tool use is seen as an integral factor in both sociocultural interaction and in AT. Hence, a training programme provided by means of a computer as a tool to facilitate learning in a mining context made this theory a choice for the study. This study captured adult learners' views about their interaction with computers in the

learning process (their first interface with computers and their reflection on their performance and the associated feedback).

Activity theory can be traced back to the work of Vygotsky, who argued that humans develop through a series of social and cultural interactions with the world, mediated by tools and signs (Kaptelinin & Nardi, 2006:265). The analysis of activities (the activity being the unit of analysis) offered a means of understanding both the mine workers as learners and their context. For Engeström (2003:306), these activities can be analysed as activity systems that are multi-faceted, with different viewpoints, interests and histories. The facilitating role of a new tool, which in this study is learning via a computer, in the lives of adult learners in an activity system at times leads to contradictions (refer to definition of 'impact' in 1.3). When some old elements in the activity system collide with new components in the system, the clash creates new comprehension and development of the activity. Contradictions and disturbances in such an activity system are not meant to imply negativity; they are the motive force of change and development that can lead to innovation and transformation in the system. As contradictions are resolved, "the community learns to widen its object and possibilities for action by re-designing its own activity" (Engeström, 2009:25).

Activity theory is discussed in detail in Chapter 2.

1.8 AN OVERVIEW OF RESEARCH METHODOLOGY

Education research is a general term used to "describe studies designed to find answers to educational questions, solve a problem or validate educational knowledge using an objective and systematic search for understanding" (Le May & Holmes, 2012:13). Its purposes are to (1) promote the development of educational knowledge; (2) generate information which helps to define the unique role of teaching and learning; (3) help to demonstrate professional accountability; (4) enable people to make more informed decisions; (5) facilitate evaluation of practice; and (6) support evidence-based practice (Le May & Holmes, 2012:13). In simpler terms, research methodology means detailed measures or techniques used to select, ascertain, develop, and analyse information about a topic in a methodical way that leads to solving a research problem.

This section describes the research methodology that guided this study towards answering the research questions.

In this study, a qualitative case study was used in leading the data gathering methods and procedures. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and its context are not evident (Yin, 2014:96). A qualitative case study was my choice of research strategy for the exploration of a computer-based programme used at the chosen mine for adult education and training. Yin (2003a; 2003b) provides an all-inclusive and methodical outline for the design and conduct of a case study. According to Yin, a case study strategy has five components: the study's questions, its propositions which reflect on a theoretical issue, its unit(s) of analysis (the event, entity, or individuals noted in the research questions), the logic linking the data to the propositions, and the criteria for interpreting the findings. The conducting of the current study included preparing for data collection, collection of evidence, analysis of the evidence, and composition of the case study report.

Specific characteristics of a qualitative case study design as well as the reliability and validity with reference to this study are highlighted in the methodology chapter, Chapter 3. Qualitative methods are characteristically more flexible in their nature than quantitative methods, thus allowing greater freedom and variation of the interaction between the researcher and the study participants (Clarke & Sousa, 2017:2). In my own understanding qualitative methods request typically open-ended questions where participants can answer in their own words. Qualitative research deals with stories, experiences and processes that members of the public can readily identify with. It also embraces some of our profound and transcending human experiences (Clarke & Sousa, 2017:3). The most common qualitative research methods used in this study were participant observation, structured interviews, focus group interviews, and field notes. Field notes are widely recommended in qualitative research as a means of documenting needed contextual information (Berger, 2015). Field notes are created during the performance of qualitative fieldwork to recall the behaviours, events and activities which took place during observation.

The intention in this qualitative case study was to spend six months from the time the candidates were registered in the second term of the year to attend AET Level 3 when this study commenced. The regular attendees in classes at this level formed part of this investigation, even though, according to the mine, Own-Time attendance is voluntary and Full-Time learners are relieved from their work to enable them to attend daily lessons.

Through interactions with the centre managers and facilitators, I learnt that the training of AET at this mine dates back to the early 1990s. The number of dropouts and repeaters of the preceding years in the programme assisted in planning for the new year's intakes. Data collection at the mine started in 2016 during the second term of studies and the research lasted for six months. There were 87 registered attendees for Own-Time Level 3 and 15 for Full-Time Level 3. The number of daily attendees at the time of this research was much lower – not more than twenty in a class. It is against this backdrop that I sampled seventeen participants who volunteered to participate in this study, consisting of four Own-Time and four Full-Time learners, five facilitators for two learning environments as the key people offering these studies, and four centre managers. The key role of facilitators was to teach the learners, thus including them in the study was important for listening and seeing how they integrated computers for learning, whereas the role of the centre managers was to oversee programme delivery on time and to address challenges encountered.

1.9 DEFINITION OF KEY CONCEPTS

1.9.1 Adult

In the context of this study, an adult is a person who, by attaining a certain age, generally eighteen, is regarded in the eyes of the law as being able to manage his or her own affairs.

1.9.2 Education

Education is more than fostering understanding and an appreciation of emotions and feelings. It is also concerned with change – "with how people can act with understanding and sensitivity to improve their lives and those of others" (Smith & Smith, 2008:104). In the mine under study, the idea was to understand how the mine workers could operate from an improved level of understanding after undergoing the computer-based programme.

1.9.3 Training

Training is a function of human resource management concerned with the organisational activity aimed at bettering the performance of individuals and groups in an organisational setting (Smith & Mazin, 2004:236). It is a process which aims to sharpen skills, change attitudes and assist employees to enhance their performance (Smith & Mazin, 2004:236).

1.9.4 Application software

Application software is any computer programme or group of programmes that is designed for the end-user. Application software comes in two general classes, i.e. systems software and applications software. The applications software (also called end-user programmes) includes database programmes, word processors, web browsers and spread sheets (Beal, 2016:58).

1.10 PROGRAMME OF THE STUDY

This study was interested in evaluating a programme to train adult learners in computer-based skills in a mine in the North-West province of South Africa.

Chapter 1 introduces the background to the study, which emerged from the mine's primary aim of reducing the illiteracy and innumeracy of its workforce. The chapter further presents the research problem statement and research questions, which centred on evaluating the impact of AET computer-based programmes at the North-West Province mine (i.e. in the workplace). Finally, the chapter offers the motivation for the study, which emerged from the desire of the mine in question to improve the professional and personal lives of their workforce and an awareness that out-dated traditional teaching practices have caused poor teaching standards in South Africa.

Chapter 2 presents a review of relevant literature that informed the research design, focusing first on activity theory and how it has been applied to understand the process of transformation that occurs when computers are used as teaching or learning tools. Second, the review further discusses the nature and use of andragogy in the context of adult education. Finally, the review examines how the information systems success model could be used to understand the process of transformation that occurs when computers are used as teaching or learning.

Chapter 3 provides a detailed discussion of the chosen research methodology for the study. The discussion first provides information about the research site and target population, which consisted of adult learners, facilitators and centre managers at Own-Time and Full-Time classes at the chosen mine. The study was situated in the interpretivist paradigm, because it reinforces the theoretical framework intended for the formation of foundational premises of the study. A descriptive qualitative case study was chosen because the research aimed at producing a first-hand an activity of the impact of the computer programme on participating mine workers. The chapter further provides a discussion of the data collection instruments, which consisted of interviews, participant observations, focus group interviews and field notes. The inductive process of data analysis is described, and issues of validity and trustworthiness are dealt with. Finally, the chapter outlines how ethical considerations were observed.

Chapter 4 presents the results of the study. The discussion embraces a detailed description of the findings from the participant observation and the focus group interviews in the two AET environments providing rich data about learners' opinions, views and needs emerging from their experience of using the computer and how it benefited them. In the presentation of the findings from the learners' focus group, four themes are identified, namely the implementation of the AET programme, learners' motivation and the benefit of attending AET studies, education and self-development, and teaching and learning methods. The data from the structured interviews with centre managers and facilitators focus on AET policy and procedures, using assessment for lesson planning, and the roles of service provider and project management and identifies contradictions and disturbances in the activity system that could lead to innovation and transformation. The results are illustrated by verbatim quotations from the interviews.

Chapter 5 concludes the study by offering a response to the research questions, but also reflects on activity theory as it was applied in this study and offers a theoretical modification of activity theory. The discussion encompasses a detailed evaluation of the contribution of the study in terms of the elements of the activity system, the zone of proximal development, subjects versus the object, unique features of the learning context, and knowledge transfer. In addition, the chapter takes cognisance of the limitations of the study, which centre on the unfortunate timing of the

study, problems of attendance in the AET centres, criteria for placing workers in the courses, logistics, and the diversity of the body of learners. Finally, the chapter offers recommendations, both in terms of practice and possibilities for further research.

The brevity of this study was motivated by the factor of the computer programme concerned. I was restricted to conducting the study by strict adherence to the programme in terms of its impact on the lives and practice of the participants.

CHAPTER 2
LITERATURE REVIEW ON TOOL (COMPUTER) MEDIATION AND ACTIVITY THEORY

2.1 INTRODUCTION

The main purpose driving this study was to evaluate the impact of a computer-based programme designed by Media Works to train adult mine workers in computer-based knowledge and skills for AET classes (see Chapter 1). The introduction of a computer-based environment encourages a change in the activity systems of the classroom, encouraging the stabilised and operationalised ways of acting on the object of each system, and consequently enhancing new ways of acting. In this chapter a discussion is provided on how AT can be used to understand the process of transformation that occurs when computers are used as teaching or learning tools and how different systems interact with and transform each other over time.

Adult Education and Training (AET) is a broad field that includes basic and continuing education, vocational and technical education, higher education and professional development. It is offered through formal, non-formal and informal educational means and by a variety of actors – the state, civil society organisations (CSOs), business and industry, and private providers (Baatjes, Motala & Hamilton, 2011:278). The choice of the term AET as used in this study, as opposed to the former term ABET (Adult Basic Education and Training), has been mentioned briefly in Chapter 1 section 1.1.

An attempt is made in this chapter to expand and elaborate on the AT as a theory for studying human computer interaction in a North-West Province mine and to situate pedagogical practices in context. The chapter is divided into main two sections, i.e. theoretical perspectives on tool mediation and AT and an information systems success model. In the first section, an overview of AT is provided, followed by the reason for the choice of AT in this study, Engeström's activity system, the zone of proximal development for adult learners, contradictions as they appear and their manifestations in the activity system, boundary crossing, and the role of the adult education facilitator. Most importantly for the study, this section also includes a discussion of the historical

background that is related to AT literature. Ngambi and Hardman (as cited in Vygotsky, 1978) state that the genesis of AT is the outcome of their search for alternative models to explain learning and motion of mediation.

The second part of this chapter looks at the information systems success model which was used to evaluate the current AET Level 3 computer-based programme used at the mine chosen for the study. In this section, I highlight the need to problematise the assumptions that underpin the evaluation of a computer-based programme to train adult mine workers in the North-West Province because of the diverse ideas around the use of computers by adult learners for teaching and learning. There seems to be no coherent set of established rules for continued enquiry of what may be adopted as principles for AET computer-based teaching and learning at the mine under study. Having used computers extensively for teaching/learning before, I became increasingly interested in the potential impact of this tool on the pedagogical practices in the given context.

AT studies of development and change include historical change, individual development, and moment-to-moment change (Russell, 2002:64), hence the next section touches on AT as it relates to these three aspects. AT is widely known for its triangular diagram made of six interrelated elements that allow for multiple networks of descriptions and interpretations of a dynamic situation. It considers the complexity of the real-life activity and accounts for historical context, culture, the role of instruments, and the motivations of people (subjects) in order to attain the object (outcome) (Zahedi, Tessir & Hawey, 2017).

2.2 OVERVIEW OF ACTIVITY THEORY (AT)

Activity theory is based on the work of Vygotsky and his student Leontev, from their studies of cultural-historical psychology in the 1920s (Leontev, 1978:14). "Activity theory is a conceptual framework based on the idea that activity is primary, that doing precedes thinking, that goals, images, cognitive models, intentions, and abstract notions like 'definition' and 'determinant' grow out of people doing things" (Morf & Weber, 2000:84). I believe that AT is a valuable tool to incorporate into the researcher's repertoire as a means of discovering the human activity without

the express explication of tasks by participants. Through the mediated study of the participants' tools an understanding of activity is revealed, which includes tacit and explicit actions.

According to Nonaka and Takeuchi (1995:82), the articulation of tacit mental models is a key factor in the creation of new knowledge, the dynamics of which are based on the discrepancies between tacit images and explicit concepts as well as between different views. New knowledge is created in cycles of conversion. These authors contend that tacit knowledge comprises the individual's images of reality and his or her visions for the future as well as concrete know-how, crafts and skills. Tacit action is therefore bound to the person and the situation and is hard to transfer to others. However, once knowledge is explicit, it can be transferred as explicit knowledge through a process that Nonaka and Takeuchi (1995:82) call combination. Figure 2.1 shows the four types of knowledge conversion and types of knowledge.

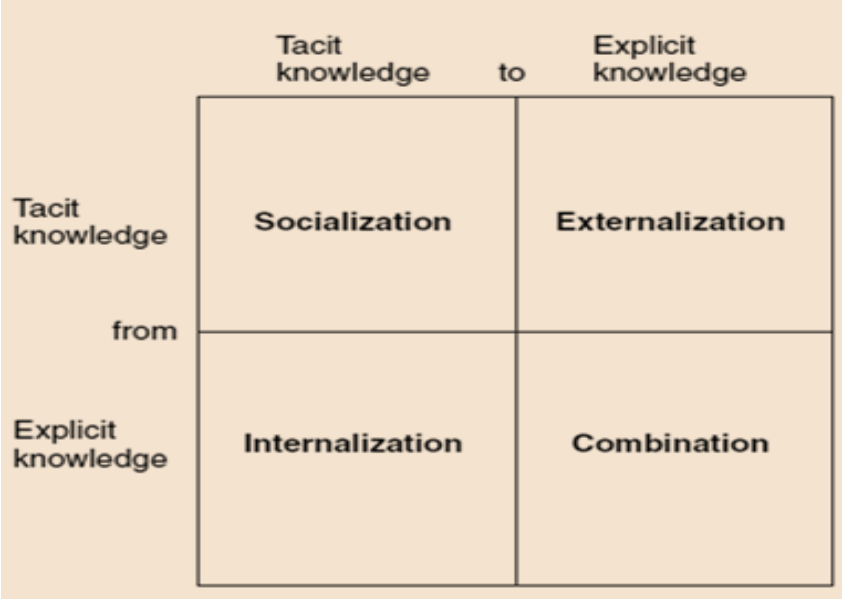

Figure 2.1: Four types of knowledge conversion and the corresponding types of knowledge (adapted from Nonaka & Takeuchi, 1995:71)

According to Nonaka and Takeuchi (1995:71-72), the transferable and manipulable explicit knowledge is created by externalising tacit knowledge because it is driven from cultural backgrounds. These authors contend that knowledge is created dynamically in social interactions among people (Figure 2.1). By sharing knowledge, people construct a social reality, which in turn

influences their judgment, behaviour and attitudes. Successive cycles of knowledge creation form the five phases of organisational knowledge creation, which start from sharing tacit knowledge and proceed through its articulation and the forming of explicit concepts to the justification and evaluation of the explicit concepts in the organisation to determine whether they are worthy of pursuit.

For this thesis, the unit of analysis refers to a group of people, individuals or a community who share a common object (or problem space) and who use tools to act on that object, transforming it. In other words, the unit of analysis was individually focused. However, the individual's action is explained from a contextual background. This implies that each activity has a history of its own and thus a historical analysis of the developments in the activity is often necessary for understanding its present condition. If, for instance, the end-user or the participant in this case is active only at the operation of most basic computer skills such as mastery of using the mouse and the monitor, it is unlikely that he/she will perform the act of typing using a keyboard, writing a letter or composing an essay.

In the example above, the cultural-historical analysis of the adult learner's level of activity would reveal why he or she is unable to engage in the given activity. Often the response is found in his/her role in society, interaction with his/her environment and issues of gender and ethnicity that come into play. The motive for learning at this mine is the need to ensure that individuals can read and write and do mathematical calculations to improve their performance at work and opportunities for promotion. The mine under study advocates that safety begins with an individual. When employees who are functionally literate can read, they can also understand the meaning of diverse danger signs and so avoid accidents.

Boyson, Harrington and Corsi (2004:89) claim that a motive is an objective/need of the activity. Boyson et al. (2004:169) maintain that the first condition of an activity is the presence of a motive or need. An individual will not move towards action unless there is a need. The centre of attention for AT is practice, i.e. to understand everyday practice in the real world. The subject's activity is not mechanically determined by its context; it makes the context undergo a metamorphosis. It

frees the subject – by always taking the risk of failing – from dependency on the concrete situation – and subordinates itself to the given context (Adler & Hecksher, 2006:125).

Activity theory provides a theoretical lens through which to see and trace the historical and evolutional developments of the activity under investigation. In addition, the analysis of the interaction of human, social, technological and organisational processes is important to understanding today's new operational practices. Followed by a discussion of the theoretical concepts that assist in understanding the activity system in learning environments, research by Ngambi and Hardman (as cited in Vygotsky, 1978) states that the genesis of AT is the outcome of their search for alternative models to explain learning and motion of mediation.

2.2.1 Genesis of activity theory

Activity theory (AT) originated from the studies of Vygotsky and Leontev on cultural-historical psychology in the 1920s and more recently in the human-computer interaction (Mohammadreza, 2017; Zahedi, Tessir & Hawey, 2017). The origins of this idea were from Vygotsky, and were later changed and extended by fellow students from the same university, including Leontev. Vygotsky's concept of AT is different from his counterparts because he believed there was a direct relation between the object and the subject and subsequently he maintained that all psychological activities are mediated by the third element, which he called a tool or instrument. AT is a conceptual framework that claims that "activity is primary, that doing precedes thinking, that goals, images, cognitive models, intentions and abstract notions like definition and determinant grow out of people doing things" (Morf and Weber, 2000:81).

Luria (in Wertsch, 1997:229) maintains that tool use also changes the conditions of human existence and the structure of human psychological processes. The change in human thought that comes about through the use of a tool is ascribed to natural processes being complemented by indirect (mediated) processes. I therefore agree that human reasoning is socially umpired, i.e. it is shaped by historical and cultural changes, concomitant with the tools used in the culture such as language and art. Cole (1999:87) concurs that human brains interact flexibly with tools and symbols to adapt to and shape environments.

Vygotsky (1978) asserts that interaction with tools exhibits history, manifests in the human activity and causes change to it, and consequently leads to mental processes. In other words, tools not only mediate human activity but also transform the human mind. The interaction is realised through the individual's object-oriented or goal-oriented activity. Vygotsky's contention is that the concentration is on the subject who operates the object. Vygotsky's ideas are represented in the now renowned triangular model (see Figure 2.2). The triangle represents the theory that learning is mediated. Moll (2002:5) explains that learning is "culturally mediated", i.e. we accumulate knowledge and practices about how to acquire and use knowledge, and distribute it as well, through our everyday lives in formal and informal settings. Figure 2.2 illustrates the basic Vygotskian triangular representation of mediation, where the subject acts on the object using mediational means (tools). Vygotsky uses a triangular scheme to express his approach and the components of the activity (as shown in Figure 2.2).

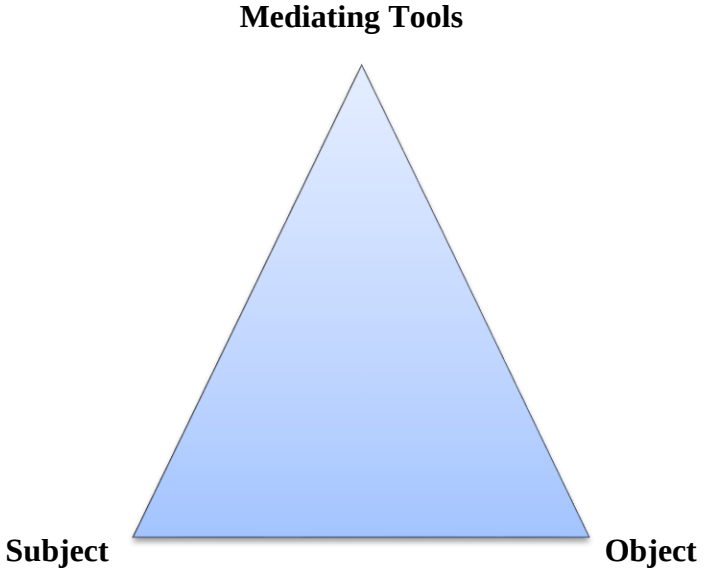

Figure 2.2: A triadic representation of actions (adapted from Vygotsky, 1978)

Vygotsky's system is composed of the subject, object, and mediating tools. In this system the subject refers to the individual or individuals that want to do a particular activity. The object is the goal that is performed by the subject who directs the activity. Mediated tools include artefacts, signs, language, symbols, and so forth, and are psychological tools through which people communicate. Vygotsky emphasised that the design of the activity could not be dealt with

separately. Vygotsky believed that tools have a historical background: throughout history, humans have created tools and have used them and knowledge in relation to them has a similar process to history and culture. It must be considered that although tools are useable whenever performing a particular activity, they are also created through activity.

The work of various scholars who contributed to AT maintain that after the death of Vygotsky his student Leontev started to revise Vygotsky's theory. Leontev criticised Vygotsky's theory and the revisions were based on two viewpoints: 1) Vygotsky's statements and ideas on activity were not completely developed and in this regard Leontev provided an extended plan and focused on the fact that activity facilitated dialogue between the interior and exterior world; and 2) whereas Vygotsky emphasised acknowledging individuals or an individual as a unit of analysis, Leontev and Engeström emphasised culture and history (Fardanesh & Maleki, 2016:2)

Leontev was able to provide a clearer view of the meaning of activity as well as the nature of collective learning. Unlike the past that emphasised the subject, he focused on the object's place in the concept of activity. In characterising activity, Leontev believed that there are differences between the immediate action and the larger overall activity system, and proposed three hierarchical levels: operation, action, and activity. Leontev posited that an activity both mediates, and is mediated by, the physical and psychological tools used, as well as the social context of the activity. This two-way concept of mediation implies that the capability and availability of tools mediate what can be done, while the tool, in turn, evolves to hold the historical knowledge of how a society works and is organised. As shown in Figure 2.3, activities are not static but dynamic. Activities change and develop and how this development occurs can either be in a top-down or bottom-up manner (see Figure 2.3).

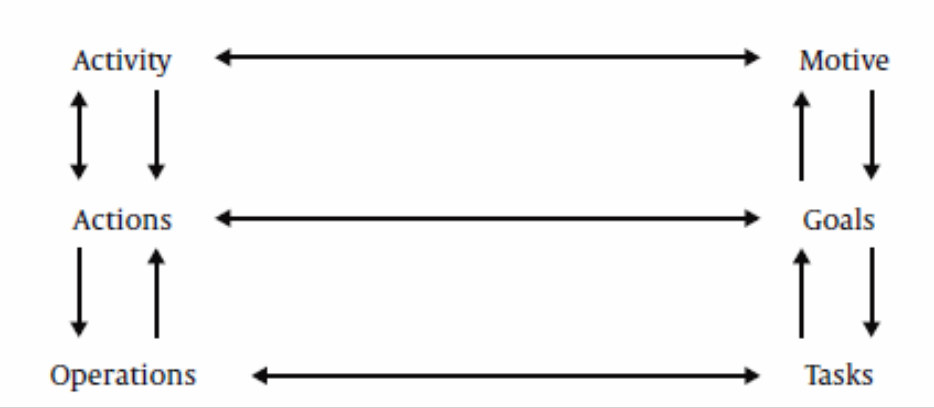

Figure 2.3: The activity hierarchy (adapted from Leontev, 1978)

Engeström (1987), based on Leontev's theory, popularised activity theory by using the concept of a collective activity system. He proposed a triangular model and in effect extended Vygotsky's triangular scheme, with the addition of elements such as subject, object, tools, rules, division of labour and community, and the situation where learning takes place received more emphasis. As shown in Figure 2.4, mediational tools are mediators between subjects and objects, rules are mediators between subject and community, and finally, division of labour mediates between community and object.

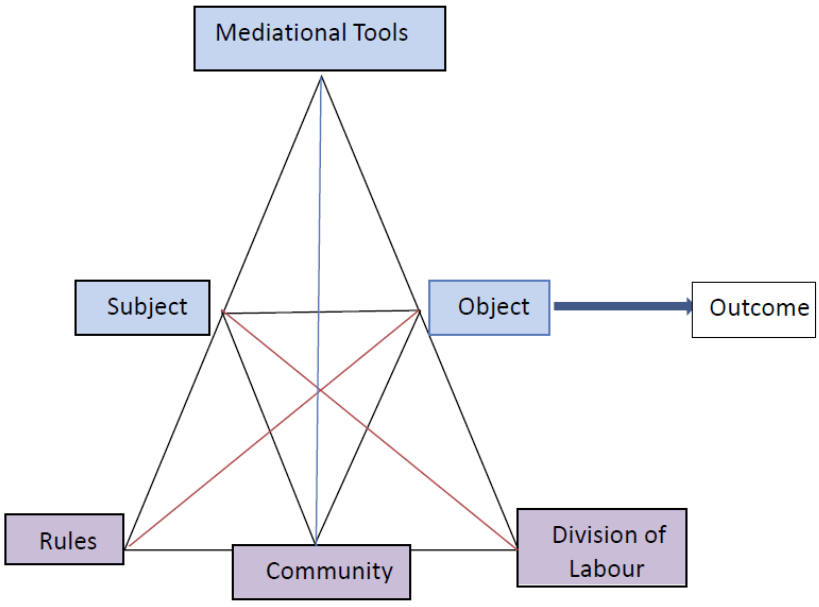

Figure 2.4: The extended triangular model (adapted from Engeström, 1987)

The seven components that emanated from Engeström's concept of AT are briefly discussed in the next section. That is followed by a thorough discussion from Engeström's perspective in 2.2.2.

a) Mediational tools

Artefacts that function as tools are invented, purchased, discarded and replaced in the activity. Mediational tools explain the semiotic process that enables human consciousness development through interaction with artefacts, tools, instruments and social others in an environment and result in individuals finding new meanings in their world. Vygotsky assumed that relationships among artefacts, tools, instruments and social others were not constant and that they changed over time (Vygotsky 1987). The interactions in which individuals engage allow opportunities for mediated action that contribute to the formation of their social consciousness.

b) Subject

The subject may be an individual or groups of individuals, role players involved in carrying out the activity directed at the object for transformation purposes. The subject depicts the individual and the collective nature of human activity using tools in a social context to clarify desired objectives.

c) Object

The object can be the goal or motive of the activity represented. The outcome of the activity of learning is thus evaluated against the initial goal, which is the object in the unit of analysis. The activity is directed at the object, which is transformed into outcomes with the help of internal tools.

d) Rules

The rules refer to formal or informal regulations that can, in varying degrees, constrain or liberate the activity and provide guidance to the subject on correct procedures and acceptable interactions to take with other community members (Engeström 1999). Rules help to establish environmental influences and conditions in which the activity is carried out.

e) Community

The community is the social group with which the subject identifies while participating in the activity. The community component represents role players as subjects in an activity. These role players share the same objective, which shapes and lends direction to the individual and shared activity under investigation.

e) The division of labour

Division of labour refers to how the tasks are shared among members of the community. The division of labour reflects a continuously negotiated allocation of tasks, powers, and variations in task roles and responsibilities among the role players or subjects involved in carrying out the activity. Crawford and Hasan (2006:287) refer to the "the vertical division of power and status" as in the differing status of adult learners involved in the activity.

According to Sannino (2005:8), AT is based on the collective heritage of its founders, in particular Vygotsky, Luria and Leontev. With the collective foundational work of the troika (a communicative approach to Russian language, life and culture), AT is unique in human and social sciences. Furthermore, Sannino (2005:10) contends that AT seeks to analyse the development within practical social activities in people's lives. In activities, humans develop their skills, personalities and consciousness. Through activities, people also transform their social conditions, resolve contradictions, generate new cultural artefacts, and create new forms of life and the self.

The legitimacy of activity theory as a unified system has been the subject of various discussions. Holzman (2006:6) uses the term AT to cover a wide variety of approaches inspired by Vygotsky, among others, cultural-historical activity theory and sociocultural psychology. Consciousness is explained in terms of elementary nervous mechanisms, using the concept of a reflex or stimulus-response connection between the individual and his/her environment. Sannino, as quoted by Yamazumi, Engestrőm and Daniels (2005) and Kaptelinin (1996:45), believes in the "principle of unity and inseparability of consciousness, i.e. the human mind, and activity".

The primary nature of this principle regarding consciousness and activity is that the human mind comes to exist, develops and can only be understood within the context of meaningful, goal-oriented and socially determined interaction between human beings and their environment.

Therefore, I contend that from the AT perspective, the human mind cannot be isolated and studied separately. According to this view, every activity has both internal and external dimensions, and the relationship between the object and the subject is reciprocal, where one transforms the other.

Following Hardman (cited in Vygotsky, 1978:265), it is evident that humans use tools to change the world and are themselves transformed through tool use. The tool mediation perspective suggests a structure for human-computer interaction that is different from the information processing loop. The components of the structure should be not only the user and the computer but also the object the user is operating on through the computer application and the other people with whom the user is communicating (Green, Robb & Rhode, 2014:39). The tool mediation perspective means that there are two interfaces that should be considered in any study of computer use, i.e. the human-computer interface and the computer-environment interface.

As the goal of activity for the participants is to teach through the computer as a tool, it is this tool that will determine how the activity of learning should be carried out and what actions the participants should perform to bring the activity to its logical conclusion – emergent teaching and learning practices. The outcome of the activity of learning is thus, throughout the study, evaluated against the initial goal, which is the object in the unit of analysis.

Furthermore, Engeström (2003:276) asserts that Leontev did not necessarily omit the representation of these components and did not elaborate on how the triangular model of action should be developed and expanded in order to represent the structure of a collective activity system. From the shortcomings highlighted here about Leontev's hierarchical model, it becomes evident that there is a need for a more user-friendly model that could be looked at to further clarify the roles of participants in this study, the different levels of activity, and the role of computer use in teaching and learning.

2.2.2 Engeström's activity system

Activity theory is understood to be the developing body of knowledge as depicted in Figure 2.4. The learners interact with the computer as an object in order to enhance what they have learned in their workbooks. The subject in this instance is the individual adult learner or a group of learners.

The object is a conceptual one, namely engaging with tools in the form of computers. The activity is directed at the object, which is transformed into outcomes with the help of internal tools. Activity theory, therefore, is a powerful interpretative tool to contend with the emerging learning practices when a computer is introduced for teaching and learning in the mine under study. It marks a shift from the traditional dualistic approach of viewing the individual as a subject or actor who learns and develops but somehow his/her actions do not seem to have an impact on the surrounding structures and societal factors (Bakhurst, 2009:199).

In this instance, the activity of teaching and learning by means of a computer was examined in its broader context. Participants' development was considered during the process of their engagement with computers. At the same time, factors that might enhance or deter their engagement were also considered. Participants in this instance were adult mine employees who still found it difficult to acclimatise to learning new "*ways of doing"* which means using the computer as a tool because the rationalised curriculum, workbooks and educators' guides provide the infrastructure which perpetuates traditional teaching and learning in the classroom.

Activity theory is defined as an idealistic and interdisciplinary framework for studying different forms of human practices as developmental processes, with both individuals and social levels interconnected at the same time (Barab, Barnett, Yamagata-Lynch, Squire & Keaton, 2004:25). The AT framework also recognises the unique and pervasive nature of the computer as a primary, secondary and tertiary tool underpinning an enormous variety of organisational information systems.

There is a limitation regarding Vygotsky's model in expounding the research questions under investigation (see Chapter 1 section 1.3). Vygotsky took the basic idea proposed by Leontev that the subject's activity is subject to the features of the activity in which the object is involved and the object itself is enriched with social and cultural content (Gong, 2001:285). The individual activity is thus part of the social and cultural process.

According to Engeström (2001:134), mediation by other human beings and social relations was not theoretically integrated into the triangular model of action, which means the object of activity

was of secondary means, precluding subjects from finding new meanings in their world. In other words, the unit of analysis was individually focused (Engeström, 2001:134). It may be the reason why Leontev, Vygotsky's student, reflected the collaborative and collective nature of human activity that resulted in what is now known as the expanded triangle model. Leontev conceptualised the theory of activity, hierarchical levels of activity, culture and history as contextual components of an activity. Sannino (2005:76), however, points out that the variant of AT as proposed by Leontev has been severely criticised by other authors, of importance highlighting that human activity cannot be understood as simple internalisation of cultural ways of doing or ready-made standards.

Moll (2002:5) is of the view that the role of mediation in the process of human activity, depends on the individual's mental readiness and the ways in which individuals' participate in different learning activities. AT attempts to understand dialectically the relationship between subject and object, man and culture, which determines their ways of doing things. Leontev saw activities as micro systems which are driven by objects and motives. An object, in my opinion, is something which is realised through individual actions that are goal-driven.

Leontev (1978) further proposes that activities can be described on three levels, which are activity level, action level and operation level. I believe, upon thorough consideration of the criticisms against these opposing accounts of AT, that many of them are not out-dated; they have an impact on the developing framework of this dissertation. My reasoning in this thesis is aligned with this view of AT.

In Figure 2.4, the central issue of engagement with computers remains the object but the link between the individual actions of AET learners and the collective activity is accentuated. Engeström (2001:205) posits that the projected outcome when using this complex model is no longer momentary and situational but rather consists of "societally important new, objectified meanings and relatively lasting new patterns of interaction". Engeström (2001) believes it is the projection from object to outcome, no matter how vaguely envisioned, that functions as the motive for this activity and gives meaning to the actions of individual learners.

The tools/signs and instruments component in Engeström's model reflects the mediational aspect of human activity through the use of both physical and psychological tools. The object component depicts the purposeful nature of human activity, which allows individuals to control their motives and behaviour when carrying out a given activity. The subject component depicts the individual and the collective nature of human activity through the use of tools in a social context so as to clarify desired objectives. The subject's activity is directed towards the object, which is transformed into outcomes through mediation.

The community component represents role players as subjects in a particular activity. These role players share the same object which shapes and lends direction to the individual and shared activity under investigation. This component places the analysis of the activity under study into the social and cultural context of the environment in which the subject(s) operates. A community is a self-identified group of individuals that share a common object (Barab et al., 2002:25). The rules component refers to explicit and implicit norms, conventions and regulations that are inherent in the classroom. These norms and sanctions specify and regulate the expected correct procedures such as prohibition of up and down movements during teaching, as well as eating and drinking. The rules impacting on the activity system include AET policy, procedure and guidelines for implementing technology in education and technology standards for facilitators. An understanding of these rules helps to establish environmental influences and conditions in which the activity is carried out.

The division of labour component reflects a continuously negotiated allocation of tasks, powers, and variations in task roles and responsibilities among the role players or subjects involved in carrying out the activity. Crawford and Hasan (2006:287) refer to the "the vertical division of power and status" as in the differing status of adult learners involved in the activity. The division of labour within the structured community at the AET centre is characterised by various layers of fragmentation because of the diverse working hours and knocking off times due to shift work at the mine.

Barab et al. (2002:25) provide an example, showing that although a computer may serve as a tool in a current action, at an earlier time this computer may have been an object or an outcome in what

may be conceived as a previous action of the same activity system altogether. Objects of previous actions may change the rules and division of labour. Activity theory is therefore about how subjects transform objects, and how the various components of the system mediate transformation. In this study, the other side could be how computers have mediated the relationship between the subject (adult learners) and the object (engagement with the computer). It is presumed that if the object of the activity is maintained, it is possible to predict the results because the object requires the subject to be on point. The main focus of AT is therefore on how subjects transform objects and how the various components of the system facilitate transformation.

The unit of analysis or activity system under investigation was the evaluation of a computer programme used for AET in the chosen North-West province mine. It was the intention of this study not to lose sight of inter-connectedness and inter-relatedness of the objects in the various levels of the activity system (Moll, 2002:5). For instance, computers as cultural tools mediate activity performed by the subject. In examining how adult learners (subjects) use computers (tools) for learning (object), I also had to look at how computers shape the participants' way of doing things (Blunden, 2007: 258).

2.2.3 Potential benefits of computer technology in supporting workers in the workplace

The use of digital tools within the classroom can either create new opportunities for enhancing learning (Mang & Wardley, 2012; Allen, 2017) or prove to be a problematic issue that cannot be ignored (Tindell & Bohlander, 2012). Technology provides a whole new opportunity for doing things in different ways. The powerful features of the computer need to be creatively used to make miners' work effective and to achieve high results. This is premised on the fact that computer technology in the workplace has led to the automation of many job tasks as they can do these tasks faster, better and more cheaply than humans (Lai, 2017). Computers create an active environment in which learners not only solve problems, but also find their own problems. This approach to learning is very different from the typical AET Full-Time and some Own-Time classroom learning, in which learners spend most of their time learning facts from a facilitator or textbook and solving the problems at the end of the chapter. Problem-solving environments are developed during integration of computers for learning that help learners better understand the workplace. For example, in English communication simulation, learners assume roles, such as those of

entrepreneurs, and learn about the knowledge and skills needed to perform various duties and learn to use the calculator for numerical exercises.

The interactivity of these computer-based environments is a particularly important feature for learning. Interactivity makes it easy for learners to revisit specific parts of the environments to explore them more fully, to test ideas, and to receive feedback. For instance, learners develop the ability to solve complex problems, evaluate possible solutions to these problems, and indicate their self-confidence with respect to mathematics, their belief in the utility of mathematics, their current interest in mathematics, and their feelings about complex mathematical challenges. The benefit of computer-based learning is that learning draws both from knowledge about human cognition and from practical applications of how technology can facilitate complex tasks in the workplace.

Cognitive technologies help students learn mathematical or numerical concepts and writing and promote complex thinking, design, and learning in mathematics and writing. The educational software and exploration and discovery activities developed by Media Works for Numeracy and English use simulations to teach core topics in numeracy and English as part of the AET programme. Using computer-based learning allows the user or worker to get work done in a more organised, efficient and timely manner, especially if the worker performs a job that requires the use of a computer on a frequent or regular basis.

Computers have enhanced the way participants learn, and every time when participants engage with computers they emerge with new experiences, i.e. their knowledge of using computers is indicative of stages of development or improvement that can be categorised according to the levels of development of activity. The participants were also confident that with their use of computers for learning they were able to operate their mobile devices and could find anything right at the time they needed it. The participants underlined the benefits of technology as easier communication, faster access to information, and more comfortable studying (Adeboye, 2016:87). In the framework of Vykotskyan socio-cultural theory, the cognitive space in which the learner moves with the help of a mediator is known as *the zone of proximal development* (ZPD). In a computer-based learning environment, the novice end-user may rely on this supportive zone for scaffolding, which is essential when embarking on the use of new skills, tools and new concepts.

2.2.4 The zone of proximal development for adult learners

Before facilitators can start to lead learners through steps which are important to learn a concept; they need a grip of how responsibilities referred to as scaffolds are pertinent to everyday life. Facilitators build on the scaffolds to develop the learner's zone of proximal development. The rationale for facilitators to incorporate the zone of proximal development in their teaching lessons is to emphasise the relationship of the learners' prior knowledge of a task with a new concept being learned (Silver, 2011: 24).

In this section, Vygotsky's influence in the development of teaching methods that are appropriate when using computers as mediation tools is highlighted. The concepts zone of proximal development, scaffolding and mediational role of tools and their potential to transform human activity are explicated in relation to the study.

A more competent peer or adult is viewed as assisting performance by bridging the gap between what the learner knows and can do and what the learner needs to know. Hardman and Ngambi (2003:10) conceptualised this gap between unassisted and assisted performance as the zone of proximal development (ZPD), the "space" where learning leads to development. The ZPD is where the interpersonal and intrapersonal activities blend and fuse and no longer exist as separate entities. Scaffolding, on the other hand, is a key feature of effective teaching and can include modelling a skill, providing hints or cues, and adapting material or activities (Copple & Bredekamp, 2009:173).

The ZPD is a concept that implies support. Vygotsky believed that there was a difference between what an individual could achieve by themselves and what they could do with the help of a more skilled individual (Chaiklin, 2003:41). The ZPD therefore refers to an individual's potential to learn (Bentham, 2002:10), and Vygotsky referred to intelligence as an individual's potential to learn. The ZPD also takes into account individual differences and the fact that various individuals may have different ZPDs for different subject areas.

Some adult learners in the Level 3 AET class at the mine were not integrating computers fully for learning, especially in Full-Time, which presented a challenge to complete the two methods of learning in the AET programme. There were no computer literacy classes to advance these learners prior to engaging with the computers in the lab. It was time-consuming for the facilitators to go to individual learners and show them how to use the mouse, keyboard and monitor. Eventually, facilitators did give individual attention for the learners to be able to engage with the computer by showing them how to reposition their hands to hold a mouse, stressing that they should hold the mouse tightly to be able to move it around.

The 120 minutes face-to-face teaching-learning was characterised by collaborative learning whereby knowledge was constructed in a social context. In another 120 minutes, the facilitator modelled a good grip for learners, showing them how to use a mouse (left and right buttons) and use a keyboard for typing as an input device, and then assisted them in changing their grip with a little practice in the computer lab. All this happened during the computer-based lessons. Finally, this period where learners were able to use the mouse and keyboard can be identified as being part of the zone of proximal development (ZPD) (Zahedi, Tessir & Hawey, 2017). The settlement of such a zone is particularly important in a collaborative context since "working out a collective zone of proximal development calls for a conceptual model that can be used for representing the activity as an object-oriented system" (Engeström, 1999:66). During this time, the participants were aware of their final goal and they framed their process into a ZPD in order to keep track of their object and outcome (Zahedi, Tessir & Hawey, 2017).

However, individual learners just needed a little coaching and scaffolding, which incorporated the principles of contingent instructions (Bentham, 2002:18), and which included offering more help when an individual was struggling and withdrawing help when the individual was succeeding. The computer software applications already include elements of scaffolding in their fundamental design, which allow the user to internalise instructions given by the software in order to learn.

The concept of mediation emphasises the role played by human and symbolic intermediaries placed between the individual learner and the material to be learned. When an adult learner comes to a shared understanding of the use of a computer, he/she is trying to achieve inter-subjectivity,

through either discussions of some sort or through engagement with the tool, as depicted in Figure 2.5.

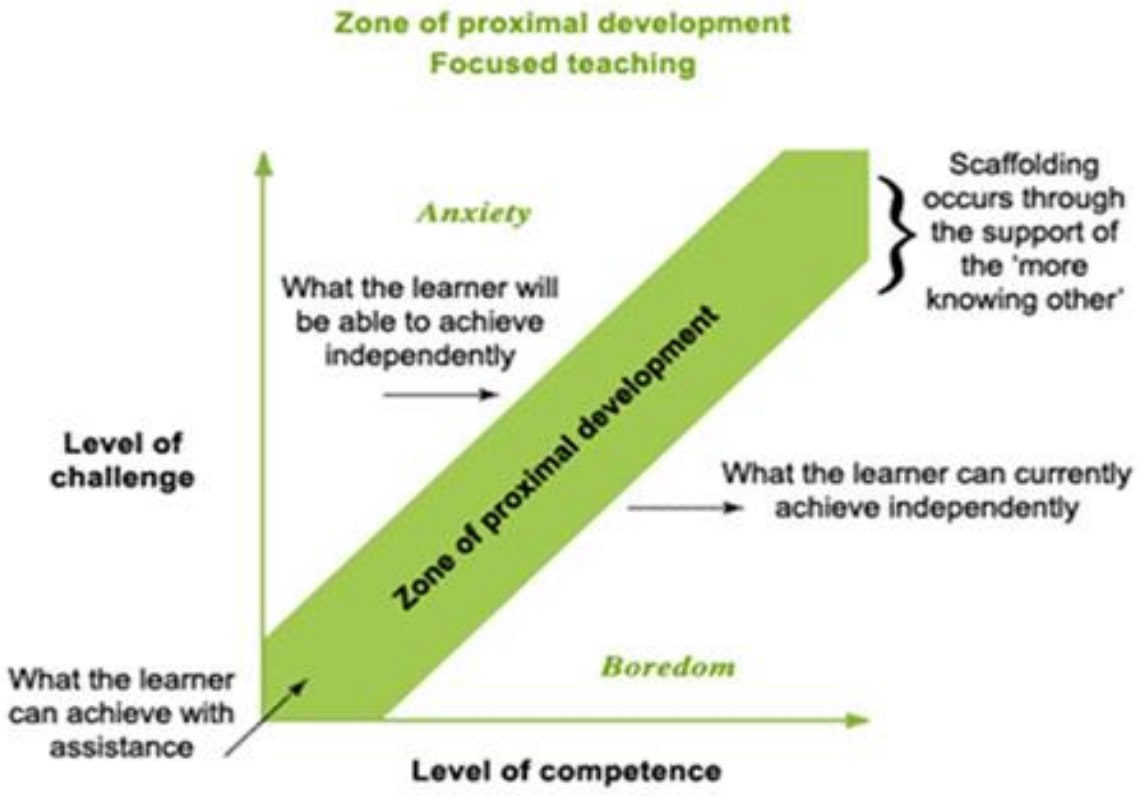

Figure 2.5: Zone of proximal development (adapted from Fullam, 2001)

As mentioned earlier in this thesis, certain computer software applications already include elements of scaffolding in their fundamental design, which also allows the user to internalise instructions given by software in order to learn. Bentham (2002:11) reminds us that to learn, the individual should internalise the instructions of the other in order to self-regulate. The potential of AT to be used as an analytical tool in this inquiry has already been described. Its potential to be used to analyse the dynamic human interactions mediated by computer-based education at both the micro (psychological and interpersonal) and macro (sociological or culture) levels to construct and understand zones of proximal development is clear.

The step-by-step process which facilitators use to apply the zone of proximal development in AET studies is as follows:

- Firstly, facilitators identify what a learner already knows. By identifying this prior knowledge, the facilitator can build on that skill set when introducing new concepts.
- Next, the facilitator builds on this knowledge through scaffolding. The scaffold helps learners move from what they already know to what they should know by the end of class. When planning lessons, facilitators keep in mind the scaffolding process by integrating guided practice in their lesson plans.
- Lastly, facilitators help learners connect their new learning to their prior knowledge. For example, a numeracy facilitator teaches learners how to master dividing decimals using the computer; then the facilitator relates this concept back to multiplying decimals.
- Through applying the concept of the zone of proximal development, the facilitator identifies what a learner already knows, teaches him or her something new to add to it, and then relates this back to his or her prior knowledge so that he or she can now understand the new concept with assistance.

Vygotsky believed that when a learner is at the ZPD for a particular task and provided with the appropriate assistance from the facilitator, it will give the learner opportunity to achieve the task presented.

The computer is one tool within a particular activity system through which knowledge, identity, authority and power relations are continually negotiated and re-negotiated (Russell, 2001:64). As new elements are introduced in the activity, contradictions can arise between the new and the old elements of the activity. For example, a contradiction may occur after a new procedure has been set up, should tension exist between it and the old activity configuration. I submit that inappropriateness is identified when an organisational policy does not correspond to the organisation's requirements or objectives, or when it simply goes against common sense.

2.2.5 Contradictions and their manifestation

A key aspect of contradictions is that their recognition delivers insight into the change and development possibilities of activities. Karanssios, Riisla and Simeonova (2017) argue that as contradictions arise, or are observed, they expose the dynamics, inefficiencies, and most

importantly, opportunities for change and action. Contradictions are historically accumulating structural tensions within and between activity systems, consequently causing a change (breakdown or development) in people's activities or themselves (Blin & Munro, 2007:457). By their nature, contradictions often cause a sort of imbalance to the original activity and have the potential for instigating a change process. Contradictions are inevitable in the functioning of any activity system because they serve as useful sources for expansive developmental transformations (Igira & Aanestad, 2009:209). They are especially important in the study of social settings because of the way they result in change and development.

In some contexts, contradictions appear as tensions (Barab, Schatz & Scheckler, 2004:25), in others as breakdowns, conflicts or clashes between people, their cultures, practices or beliefs (Basharina, 2007:82; Demiraslan & Usluel, 2008:458), and yet in others as dilemmas and discoordinations (Roth, 2004:1). Several researchers (e.g. Lim & Hang, 2003:49; Basharina, 2007:84; Murphy & Rodriguez-Manzanares, 2008:442; Demiraslan & Usluel, 2008:458; and Hu & Webb, 2009:178) argue that contradictions often occur in the form of limited tools and infrastructure, training of teachers, misalignment of academic calendars, culturally inappropriate pedagogical models, academic socialisation, technological access, methods of learning accreditation and diversity in backgrounds, cultures, values and beliefs.

According to Engeström and Sannino (2011:1), a double bind is a type of paradox that is a manifestation of a contradiction within the meaning of activity theory. I take up the same idea, adding to it that paradox is not a contradiction, but that paradoxes can be manifestations of contradictions. For this research, contradictions were used as a conceptual framework to guide data collection and analysis (Foot & Groleau, 2011:238).

Activity theory uses the term contradictions (breakdowns, conflicts) to indicate a misfit within elements, between them, between different activities or between different developmental phases of a single activity (Engeström & Sannino, 2011:371). The challenges or problems that crop up with the introduction of computers as mediational tools in the activity of learning from the point of view of AT could be termed contradictions and indicate a misfit within elements. Activity systems are characterised by their own internal contradictions. These contradictions can also be

tensions that arise between the various components of the activity system. These tensions are critical to understanding what motivates specific actions within the activity system, and more generally in understanding the dynamic nature (evolution) of the system (Barab et al., 2002:25).

From the above discussion of contradictions and their manifestation according to the AT framework, it is evident that contradictions are important aspects in an activity because they might be used as sources of development. In other words, contradictions trigger reflection, thereby helping in the improvement of the activity. Contradictions reveal themselves as breakdowns, problems, tensions or misfits between elements of an activity or between activities (Demiraslan & Usluel, 2008:460).

The following *tensions* within the activity developed by Media Works were identified: systems quality, which measures technical successes; information quality, which measures semantic success; and user satisfaction. All these tensions have an impact on individuals, the organisation, the object and the community, as well as between the rules and the community. Furthermore, the solutions were identified which may be adopted to relieve tensions at a later stage.

In the first case, the tension exists because of the effects that the object (e.g., changes in the Media Works programmes) will have on the community. For example, if a change (the object) is introduced in the workbook, other learners (the community) might need to be informed because they may need to perform additional tasks as a result (e.g. update the documentation). The tension exists because developers are not aware of some interdependencies in the software and, therefore, how other members of the community are affected by their work. Nevertheless, the community must support the evolution of the programme and guarantee that the programme delivered is not inconsistent with the specifications, manuals and other artefacts.

In the second case, the tension exists between rules and the community because one rule suggests that a computer technician should perform a specific action so that the programme should run fully, but he takes days or weeks after a call has been logged by the AET centre manager, whereby the technician's slackness affects the rest of the community. Media Works' learning intervention management system called Navigate is a computer system used for computer-based learning in

the AET programme. It was noted that facilitators in other AET centres relied more on workbooks only than on the computer applications intended to up-skill learners because of a lack of access to computers, thus defeating the purpose of using the computer (object) for teaching and learning.

In the third case, the tension exists because of limited tools and infrastructure, technological access and methods of learning. Identifying these contradictions has helped me to see activity systems beyond just a single system but also the links with other systems. Without such links, a system cannot function effectively. These other systems were considered simultaneously as constituents of the activity system during analysis. My opinion of an AET computer class is that it should be one of the many places of socialisation where a theoretical framework helps to understand and analyse the relationship between the human mind (what people think and feel) and activity (what people do).

Tensions produced by the primary contradiction were illustrated for each element in the activity system: subject, object, instruments or tools, community, rules and division of labour. Examples from the case study showed that the primary contradictions between quality and use of the AET computer programme at this mine manifested themselves in the form of tensions in each element of the activity system and were thus numbered 1-4 and shown in Figure 2.6.

Engeström (2001:133) identifies four levels of contradictions, which are summarised in Figure 2.6. Primary contradictions refer to inner contradictions within each constituent component of the central activity system (i.e. rules, artefacts, division of labour, object, subject, and community). “This primary contradiction pervades all elements of our activity systems” (Engeström, 2001:137).

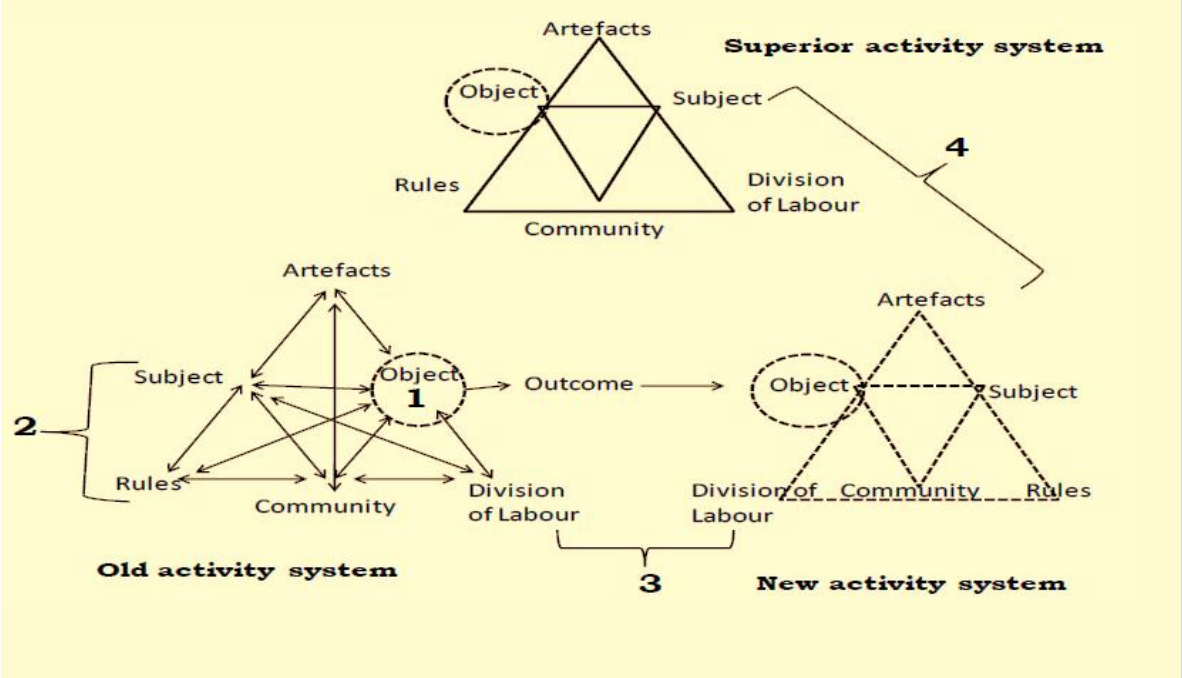

Figure 2.6: Four levels of contradictions (adapted from Engeström, 2001)

The primary contradictions were dormant and revealed themselves in secondary contradictions which took the form of concrete tensions between the constituents of the central activity system. Secondary contradiction takes place between the constituents of the central activity (i.e. rules, artefacts, division of labour). Activity theorists highlight that the primary contradictions evolve taking the form of secondary and tertiary contradictions that contribute to the instability of the system. Tertiary contradictions occur when the designed or given new model is gradually replaced by another new one, firmly grounded in practice through the resolution of the contradictions between the given new and the existing forms of the activity. Quaternary contradictions occur when activity participants encounter changes to an activity that result in creating conflicts with adjacent activities. Table 2.1 shows how the four levels of contradictions were identified in this case study.

Table 2.1: Four levels of contradictions

Level of Contradictions	Example
Primary Contradiction	Out of four AET centres only one for Own-time used face-to-face and engaged with computers for curriculum delivery. The curriculum for Media Works, who are service providers for AET learning material, encompasses face-to-face and multimedia, which created concrete tensions between the constituents of the central activity system.
Secondary Contradiction	AET centre managers and facilitators did not seem not to be accountable for responsibilities introduced to them like integration of computers for teaching and learning to meet other daily teaching responsibilities. I observed tension between the rules and the instruments when there were highly hierarchical policies and procedures regarding installation of any computer software in the mine's computers. Purchasing of new computers, which were not installed with Media Works computer software used for teaching and learning, also caused tensions in the case study in the sense that centre managers had to log a call with the Media Works service desk to install a new software package and the turnaround time was not guaranteed
Tertiary contradiction	New methods for facilitation, which included integration of computers, did not necessarily fit into facilitators' daily classroom practices as they seemed to be comfortable with face-to-face teaching and only used computers to fast-track those adult learners who were seasoned performers.
Quaternary contradiction	One area of change to facilitators' daily classroom practice interacted with other activities in the classroom and necessitated more change.

According to Akkerman and Bakker (2011:167), a boundary crossing perspective allows a more fine-grained understanding of the required new relationships and cultural perceptions, as it is specifically targeted at analysing challenges and learning opportunities of situations in which diverse stakeholders (e.g., different disciplines or institutions) need to collaborate. Boundary objects are designed to enable the change of horizons and the crossing of boundaries and hence continue to support learning.

2.2.6 Boundary crossing: learners' engagement with computers as a tool for learning

The term "boundary zone" has been proposed to describe a place where elements from two activity systems are present (Tuomi-Gröhn & Engeström, 2003:54; Konkola, Tuomi-Gröhn, Lambert & Ludvigsen, 2007:211). I contend that the term was proposed to describe learning which takes place

when ideas from distinct cultural backgrounds, race and gender meet and form new meanings in a teaching-learning situation. It is the view of this study that even though boundaries are often seen as sources of potential difficulties, they can also afford opportunities for innovation and renewal (Wegner, McDonalds & Snyder, 2002:153). Crossing boundaries may act as a source of deep learning, forcing participants to take a fresh look at their longstanding practices and assumptions.

Wegner et al. (2002:153) observe that "while the core of a practice is a locus of expertise, radically new insights and developments often arise at the boundaries between communities". Adult learners in this study were not using computers all the time, as teachers still relied on workbooks for teaching and learning. This could indicate their inability to access the infrastructure in the mine or that their computer skills were deficient. Although computers have been hailed for their potential to revolutionise teaching practice, research reports indicate that change is a complex matter and may be related to such factors as the materiality of the tool itself as well as the way it is ultimately adopted or rejected by individuals in specific social settings.

Activity theory maintains that in the process of engaging in an activity, the motive of the activity is re-conceptualised and new forms of activity as well as culturally new patterns of activity are created. Central to this transformational process of expansive learning is the role of contradictions, inherent within and between activity systems, as sources of change and innovation (Tsui & Wong, 2006:97). For individuals in a new territory, it involves going into unfamiliar territory and cognitive retooling as they bring to the domain some expertise and practices from which to learn and work together as a collective in order to generate new ways of executing their activities using a computer, and knowing or acquiring new knowledge (Tsui & Law, 2007:98). In this study, this transformation was brought about by mutual engagement with adult learners, which required of them to cross community boundaries when they were engaged with new activities. Therefore, learners revealed a horizontal distribution of actors with diverse knowledge, skills and competencies rather than a hierarchical distribution of people with different levels of excellence. This horizontal exchange of expertise that generates new understanding is called boundary crossing (Roth & Lee, 2007:186).

More specifically, boundary crossing is defined as the process of knowledge production, which occurs as people from different positions, within or across organisations, transport the tools, language, and rules of social interaction from one domain into a new domain. Bowker and Star (2000:298) explain that boundary objects can be "stuff and things, tools, artefacts and techniques, and ideas, stories and memories". Boundary objects are those designed to enable the change of horizons, and the crossing of boundaries to continue to support learning.

Tuomi-Gröhn and Engeström (2003:27) point out the centrality of symbols, technologies, texts and systems or artefacts for constructing continuities and transformations across social situations. Computers are objects already mentioned as they can be used in different environments and situations while they maintain their intended function and originality. Adult learners in this study used computers as boundary objects which triggered a new way of doing things. They were keen to open up to new challenges they were facing and put fear of computers behind them to enter the new phase which provided new opportunities necessitating a shift in their ways of doing things which is learning the traditional way in a face-to-face environment. I suggest the only way that adult learners can learn how to use the computer is by using it, not being ashamed of getting their hands dirty.

Adult learners in this study in Own-Time were confronted with computers and needed to adopt a hands-on approach in order to learn how to use them. In the same way, facilitators in this study were confronted with the tools and needed to adopt a hands-on approach in order to learn how to use them. I therefore maintain that during learners' engagement with computers as boundary objects and tools that have boundary-crossing capabilities, the facilitators could be steered to the experience of using computers as tools for teaching.

The role of a facilitator is to create and maintain peak learning conditions for learners. Facilitators help learners to learn, and assist them in creating a climate which makes it easier for learners to be receptive. They remove the obstacles to learning by having a good understanding of preparation to design learning content according to appropriate learning principles.

2.3 THE ROLE OF AN ADULT EDUCATION FACILITATOR

Adult education facilitators can play a role in addressing the challenges that adult learners face every day when they engage with computers during the AET classes, for instance the frustrations they experience at the hands of the information technology technicians hired by Media Works. This is confirmed by Cushner, McClelland and Safford (2006:70), who argue that teachers (i.e. adult education facilitators) should become cultural mediators in their classrooms and walk both sides of a double-edged sword. One of the many approaches to mediation is to prepare learners by recognising their diversity at the onset and by expecting them to work together.

According to Ginsberg and Wlodkowski (2009:17), the role of an adult education facilitator is to create space for adult learners to clarify their own cultural values and biases. Learners will therefore feel included, at ease and generally motivated to learn. I support Ginsberg and Wlodkowski (2009:108) by adding that the embedded role of an adult education facilitator is to promote acceptance, respect and compassion among learners irrespective of their backgrounds, circumstances, status and power.

Adult learners in Full-Time and in some Own-Time studies feel that their learning is incomplete without engaging with the computer during classes. It hampers their progress in learning how to use a computer when they are unable to access a computer to enhance learning by completing computer-based tutorials and simulations. The responsibility of an adult education facilitator is to help adult learners discover their intrinsic abilities and motivation. However, in some AET centres facilitators were demotivated by the challenge they were facing of computers sitting in the computer lab for months not being used, waiting for Media Works technicians to install the software application.

This study, which is based on AET for adult learners working at the mine in the North-West Province, draws on the work of Guo and Jamal (2011:15) on andragogy. The authors mentioned have selected andragogy by Knowles & Associates (1984:198) for lifelong learning. The literature on andragogy identifies gaps in knowledge and appraised models in lifelong learning and their

application to adult learning. Adult education facilitators are seen as being in the position of employers whereas adult learners are in the position of workers.

2.3.1 Andragogy

This approach consists of the facilitation of adult learning from assumptions about the characteristics of adult learners. Guo and Jamal (2011:18) point out that these assumptions about learners can be used to design, implement and evaluate appropriate teaching strategies and create an effective learning environment. According to Crous, Kamper and Van Rooy (2002:14), andragogy is a term coined by Knowles in *The Modern Practice of Adult Education* (1970) to refer to a teaching method that differs from pedagogy. Essentially, andragogy was premised on two main features, being the difference between adult and child learners, with adults requiring a different instruction (andragogy), and the capacity of each adult learner to define his or her unique learning requirements by drawing on his/her life experiences (learner-centredness).

In my understanding, andragogy is therefore a method of facilitating learning to adults. Lee (cited in Crous et al., 2002:15) states that Knowles contrasted children's characteristics and behaviour against those of adults. He then formulated the first four characteristics of adult learning, namely self-concept, experience, readiness to learn and orientation to learning. Knowles later added the fifth characteristic, namely intrinsic motivation. Knowles (1984:43) defined andragogy as the art and science of helping adults learn, though it has also been described as both a philosophy and a method (Rachal, 2002:219).

The four characteristics formulated by Knowles (1984) reveal that adult learners can learn in a diverse learning centre despite the challenges that they experience. Andragogy has been the most influential, most persistent and best-known theoretical construct in the field of adult education for over three decades (Jarvis, 1995:93; Rachal, 2002:225). Andragogy has become part of the mainstream of adult education in the Anglophone world and has acquired the status of established doctrine in South Africa (Cretchley & Castle, 2001:494). In the following sections, the characteristics of adult learners as formulated by Knowles (1990:57-63) – self-concept, experience, readiness to learn, orientation to learn and intrinsic motivation – are briefly discussed.

2.3.2 Self-concept

Self-concept is the image that people have of themselves and tends to be more pliable when people are younger and still going through the process of self-discovery and identity formation. As people age, self-perceptions become much more detailed and organised as people form a better idea of who they are and what is important to them. Mamwenda (2008:308) describes self-concept as a combination of concepts, beliefs, ideas, feelings and attitudes that a person has about him- or herself. Self-concept results from self-evaluation and evaluation by others for which one has a high regard.

Hockenbury and Hockenbury (2006:66) suggest that fully functioning people are also flexible and ever-evolving. Their self-concept is not fixed, and they are constantly taking in new information and experiences. This characteristic also proceeds from the assumption that adult learners are responsible and mature people who demand recognition and want to take control of their lives and development. They have a self-concept of responsibility and accountability for their own life, decisions and actions. They demand to be treated with respect and recognition of their capability of self-direction. The characteristic of self-concept motivates adult education facilitators to allow and encourage adult learners to actively participate in the preparation for their learning.

Some adult learners at this mine are parents and at the same time are workers who have to balance home and work and also create space for their own learning. Since the mine does not provide transport to the learning centre, the distance from their homes or work places to the AET learning centre often prevents them from attending classes regularly. The mine is looking at assigning the learners to the learning centres closer to their homes rather than to their workplace, as is currently the case. Boosting their self-concept implies that adult learners are enabled to take control of their learning, which is self-directing. This self-direction always needs to be encouraged during lesson facilitation. Adult learners learn by actively participating and expressing their views. Active participation and sharing of personal experiences contribute positively to the adult's self-concept.

2.3.3 Experience

Adult learners bring a reservoir of experience into the learning centre, which constitutes the primary source of learning. Crous et al. (2002:59) explain that the life experiences of adults have

given them more stories than those that are to be found in the textbooks. Their special events, duties, responsibilities, achievements and challenges contribute to their experience that can be utilised for learning purposes. Adults come to the learning situation with a wide frame of reference. This means that adults have lots of already existing knowledge, values and skills to compare new knowledge with. As a result, learners are encouraged to share their experiences, both good and bad, and then learn from them. Crous et al. (2002:41) explain that whatever the intended outcome (e.g. writing, reading, oral, listening, interpretative, analysis, practical or livelihood skills), it should be about learners' identity, environment and personal stories. The learners' experiences in lower AET level classes are shared during activities such as those shown in Figure 2.7(a) as motivation for new recruits.

The pictures in Figures 2.7(a) to 2.7(d) depict a typical engagement of learners during open day at the chosen North-West Province mine, where they were encouraged to serve as ambassadors to motivate the upcoming intake of adult learners for schooling. During open days, they are given memorabilia such as T-shirts, school bags, and lunch-boxes as a form of motivation, and they share their experience of attending previous classes with the novices. A video is shown at all strategic areas of the mine showing the processes from open days, and formal teaching and learning until the certificate award ceremonies. The videos of the learners' experiences during their journey in AET classes are shown in strategic areas such as the change houses, lamp rooms, control room, communication halls as well as at the time and attendance offices. The marketing strategy in Figures 2.7(a) and 2.7(b) is employed at the mine to attract its employees who are functionally literate to attend AET classes at all levels. The AET classroom is pictured in Figure 2.7(c) and computer lab in Figure 2.7(d).

Figure 2.7(a): Open day and registration of AET learners at the North-West Province mine

Figure 2.7(b): Memorabilia for marketing the AET open day at the North-West Province mine

Figure 2.7(c): The classroom setting for AET at the North-West Province mine

Figure 2.7(d): The AET computer lab at the North-West Province mine

2.3.4 Readiness to learn

The third characteristic identified by Knowles (1990:57-63) assumes that adults learn best and are motivated to learn when they learn things relevant to their everyday lives as workers, parents and community servants. Havighurst (cited in Crous et al., 2002:85) clarifies the characteristic of "readiness to learn" by introducing the concept of "teachable moments", which refers to a sensitive period for learning. This stage is determined by the individual's physical development and maturity and by the demands of the environment. An adult education class is constituted of learners

at diverse levels of readiness, i.e. those who are prepared to learn only livelihood skills and those who are ready to learn the entire curriculum. These diverse levels of readiness to learn demand that an adult education facilitator should prepare a facilitation plan that will cater for all learners alike.

2.3.5 Orientation to learn

When people mature, their time perspective changes from one of postponed application of knowledge to immediacy of application (Crous et al., 2002:101). People's orientation towards learning shifts from subject-centredness to problem-centredness. Adults often want to learn things that will enable them to address their day-to-day challenges. Adult learning is also activity-oriented. Crous et al. (2002:15) hold the view that adult learners prefer a learning process that is realistic and relevant, which requires adult education facilitators to know their learners and their shortcomings.

The challenge at this mine is that in most classes there are diverse cultural, age, and religious groups and people of diverse sexual orientation. The area where the mine is situated is in the former Bantustan of the then Bophuthatswana government that is predominantly Tswana speaking. However, the mine has a large number of Nguni, Sotho, Mozambicans, Zimbabweans, and Malawians who attend AET classes. Such classes require more effort and time from adult education facilitators. An adult education facilitator needs to ensure that a solution to one cultural group does not discriminate against others. Facilitators are challenged to be very accommodating and creative in their lesson preparation and facilitation of the adult learning process.

2.3.6 Motivation to learn

Anderson (1993:41) maintains that many adult learners return to school to enhance leisure time, to boost their self-pride, to gather and disseminate information for effective living, and/or to keep their minds active and vital. According to this characteristic, adults undertake to learn something when they know that they need to learn it. They will know that they need to learn something when they know the benefits of learning it and the disadvantages of not knowing it. In the case of the self-concept and readiness to learn, the stipulation of a required number of learners in a class poses a challenge. It may not always be possible to find a class of 20 or more learners because some

learners deregister before the end of the academic year after or before reaching their desired objective.

Such learners claim amongst their reasons for dropping out the language barrier, because teaching is conducted in English, which poses a challenge for other language speakers who have never spoken English. I argue that the mother-tongue should be used in the AET levels from Basic Oral to Level 3. Shift work is another reason for dropping out, because when they work night shift in a month they could miss their classes due to lack of sleep and fatigue. All the above reasons demotivate learners and keep them from attending classes. Boniwell (2013:57) mentions that positive psychology takes as its starting point questions not of what makes people miserable, but of what makes them happy, and encourages them to learn.

2.4 CRITIQUES OF ANDRAGOGY

In discussing his way into andragogy, Faber (2006:213) became convinced that in the andragogical perspective of thinking and using this category, one could better discuss the problem of adults independent of pedagogy – problems of self-education, life-wide learning, activities against lack of education, sense of responsibility, living after one's own concept – all these perspectives could be touched on by a theory of andragogy. Newman (2007:93) believes that andragogy does not propagate social change but moulds a person to conform to the contemporary situation. This means that citizens who attend an AET class that uses andragogy as its model of facilitation will accept any situation within which they find themselves, even if it is not favourable, and will not initiate or participate in bringing change. I claim that andragogy does not enable adult learners to participate in social change, as the theory of social change presents the educator or facilitator as an important social issue for discussion. According to Mezirow (2007), the educator's role is to support the trainees in searching for the dysfunctionality of admissions and practices and comprehending their experiences through different point of views.

Blondy (2007:116) suggests that the assumptions of andragogy are often criticised due to the lack of empirical evidence to support them, even though several educational theories are represented within the assumptions. Adding to this, I agree with Morland (2003:233), who asserts that business

trainers, coaches, and instructional designers need to understand the dynamics of an andragogical model of adult learning. In the next section, I present the system on which this study was based, namely the information systems success model. In this study, the updated information systems success model was used to evaluate specific applications in the AET computer-based class presented by Media Works outsourced by the mine in the North-West Province.

2.5 INFORMATION SYSTEMS SUCCESS MODEL

The information systems success model was applied in the mine setting with the goal of better understanding how this approach could contribute to our understanding and modelling of Information System (IS) success. The IS model, hereafter referred to as "D&M" (DeLone & McLean, 2003:9), was used as a framework to conceptualise and operationalise the following: information systems' success, value and effectiveness, implementation and use of information technology at this mine.

DeLone and McLean (2003:9) introduced an update to their IS success model. The main changes concerned *quality* and it forms in the IS model. According to DeLone and McLean (2003:9), quality has three major dimensions, i.e. "information quality, systems quality and service quality". Service quality is comprised of reliability, responsiveness, assurance, and empathy, while information quality is comprised of accuracy, timeliness, completeness, relevance, and consistency. The measures in the model are chosen according to the target to be evaluated and the object of interest. The model identifies and describes the relationships among the six critical dimensions discussed above which are presented in Figure 2.8.

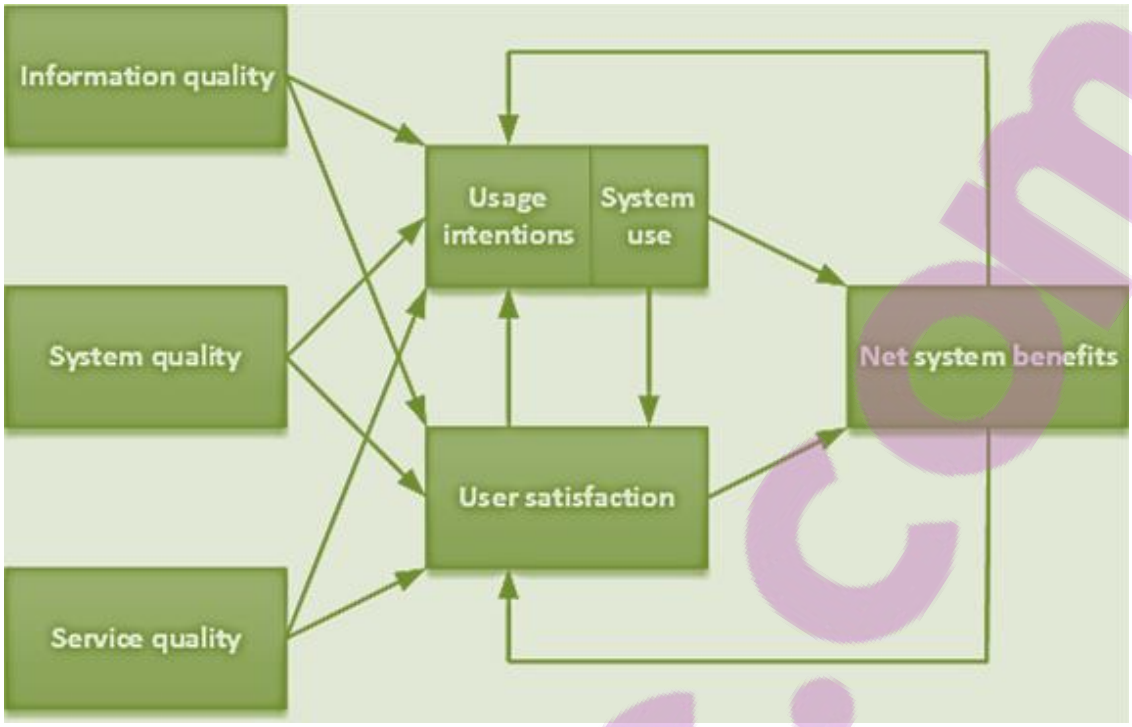

Figure 2.8: Updated D&M IS model (adapted from DeLone & McLean, 2003:9)

The primary areas of this study included the evaluation of information systems' effectiveness and value, and the implementation and use of information technology in AET learning centres of this mining industry. Through the application of electronic technologies, computer-based learning provides opportunities for both cost reduction and service improvement (Boyson et al., 2004:188). I argue that system quality embodies the technical success of a system, which comprises reliability, responsiveness, assurance and empathy, while information quality comprises accuracy, timelessness, completeness, relevance and consistency.

The updated DeLone and McLean IS Success Model includes arrows to demonstrate proposed associations among success dimensions in a process. According to end-users, "system quality" in the Internet environment does not measure the desired characteristics of the Navigate computer programme. Usability, availability, reliability, adaptability and response time (e.g. download time), which also include qualities and value by users of the AET system, are compromised.

I contend that "information quality" captures the Navigate content issue. Web content appears not to be personalised, complete, relevant, easy to understand, and secure if we expect prospective

end-users to initiate English communication and numeracy programmes via the Internet and return to the home page regularly. Along with information quality and system quality, information systems are also commonly evaluated according to the quality of service that they can deliver. Service quality directly impacts on usage intentions and user satisfaction with the system, which, in turn, affect the net benefits produced by the system.

Table 2.2: The six dimensions of the updated D&M IS Success Model (adapted from Delone & McLean (2003:17)

Construct Name	**Brief description of construct characteristics**
System quality:	As with information quality, the overall quality of a system is also one of the most common dimensions along which information systems are evaluated. System quality indirectly impacts the extent to which the system can deliver benefits by means of mediational relationships through the usage intentions and user satisfaction constructs.
Information quality:	Information quality refers to the quality of the information that the system is able to store, deliver, or produce, and is one of the commonest dimensions along which information systems are evaluated. Information quality impacts both a user's satisfaction with the system and the user's intentions to use the system, which, in turn, determine the extent to which the system is able to yield benefits for the user and the organisation.
Service quality:	Along with information quality and system quality, information systems are commonly evaluated according to the quality of service that they can deliver. Service quality directly impacts usage intentions and user satisfaction with the system, which, in turn, affect the net benefits produced by the system.
System Use:	Intentions to use an information system and actual system use are well-established constructs in the information systems literature. In the IS success model, system use and usage intentions are influenced by information, system, and service quality. System use is posited to influence a user's satisfaction with the information system, which, in turn, is posited to influence usage intentions. In conjunction with user satisfaction, system use directly affects the net benefits that the system can provide.
User Satisfaction	Like actual system use, user satisfaction directly influences the net benefits provided by information systems. User satisfaction refers to the extent to which a user is pleased or contented with the information system, and is posited to be directly affected by system use.

Net System Benefits	The net benefit that an information system can deliver is an important facet of the overall value of the system to its users or to the underlying organisation. In the IS success model, net system benefits are affected by system use and by user satisfaction with the system. System benefits are posited to influence both user satisfaction and a user's intentions to use the system.

The observation made is that usage is supposed to measure everything from a visit to a website, to navigation within the site, to information retrieval, to execution of a transaction, which is not currently the case at this particular mine. In this instance end-users are unable to go back to fix or refresh before they can commence with the assessment. They are unable to bypass other chapters in the lesson and continue where they are comfortable. The system does not allow them to, thus compromising user satisfaction. Over and again the facilitators needed to log a call with the information systems department for assistance in installing the computer software. Although the three variables (system quality, information quality and service quality) are correlated, the relationship between them is not strong enough to warrant their use as substitutes for one another. The three mentioned earlier appear not to be adequate to measure the net benefit. Table 2.2 gives a background of the successful computer programme which warrants net benefit.

2.6 SUMMARY

In this chapter, I discussed activity theory and the IS model, which were used as a descriptive tool when evaluating computer programmes, quality, information quality, use, and benefits for this study. A brief historical development of AT and the IS model was presented. The potential of the framework's conceptual tools is to describe and elucidate the participants' engagement with the computer as a tool for transformation and mediation with reference to famous researchers of AT and IS model such as Vygotsky, Engeström and Leontev, as their thinking influenced the presentation of this chapter.

The following chapter presents the research design and methodology of the study.

CHAPTER 3
RESEARCH METHODOLOGY OF THE STUDY

3.1 INTRODUCTION

This chapter discusses the research design and methods that were followed in undertaking this study. A qualitative research approach undergirded by activity theory (AT) was adopted as developmental research method. The aim, as reflected in Chapter 1, was to evaluate the impact of AET computer-based programmes at the North-West Province mine (i.e. in the workplace). Using AT as a theoretical and methodological framework presented the opportunity to identify and examine the actions of the adult learners as they engaged in the activity systems. A focus on the object of the activity provided a significant backdrop against which the adult learners' actions were performed, thus allowing for more informed data.

Henning, Van Rensburg and Smit (2004:31:59) state that research methods should include the researchers' reflective knowledge of how language makes meaning, the role of theory in interpretation and understanding, and how ideology and politics manifest in the research. Onwuegbuzie and Leech (2010:882) simplify this explanation by saying that qualitative researchers study the phenomena in their natural settings, and then try to understand and interpret them. This chapter therefore begins by discussing the choice of the research methods, qualitative research as the approach of choice, and then moves on to discuss the research design, data collection techniques and procedures for data analysis, and ethical considerations that were observed when conducting the study.

This study asked questions grounded in the qualitative research design. These questions involved deciding what the research purpose and questions were, what information appropriately answered specific research questions, and the strategies most effective in the process of gathering and analysing data (Denzin & Lincoln, 2005:78). In qualitative studies, however, there is much more focus on the researcher and participants as individual persons. Depending on the philosophical framework, participants may even be viewed as co-researchers (Waters, 2017:97).

3.2 RESEARCH SITE AND TARGET POPULATION

This study was conducted at the platinum mine located in the North-West Province within the Rustenburg Local Municipality, approximately 20 km east of Rustenburg and 60 km west of Brits. The mine is situated close to the main Rustenburg-Marikina road and the Rustenburg-Thabazimbi road. The mine comprises three separate mining operations, with four AET centres, one for Full-Time adult learners based in a central location and three for Own-Time adult learners. The mine community is defined as those towns, villages and settlements that fall within a 50-km radius, or greater if appropriate, of the mine. Although the mine community generally falls within one or two municipalities, this mine is an exception to the rule as the 50-km radius covers five municipalities.

3.2.1 Mine labour

In the context of the mining industry, mine labour is defined as those employees who are employed directly by the North-West Province mine and not by other suppliers of goods and services. Labour falls into one of three categories, which are local employees, migrant workers and transitional workers. Local employees are employees who originate from the mine community. Migrant workers are those who originate from the rural labour-sending areas, who live in hostels or other mine-provided accommodation, and who have no formal local dependents. Transitional workers are those workers who bridge the definition of local and migrant workers by falling into both categories.

Three types of migrant labour include provincial migrant workers, South African migrant workers, and foreign migrant workers. Provincial migrant workers are those who come from areas within the mine's host province but outside the mine community. South African migrant workers are those who come from other South African provinces. Foreign migrant workers are those who come from neighbouring states within the Southern African Development Community (SADC) states. It is these workers that are referred to as migrant workers in the Mineral and Petroleum Resources Development Act.

Generally, transitional workers are migrant workers with long service histories on the mine, who have become involved in relationships with local people and have established urban (second) families locally. The majority of AET enrolled learners at this mine are migrant workers.

The target group was adult learners, facilitators and centre managers at Own-Time and Full-Time classes presented at this mine under study. These adult learners mostly work underground and only a few are working on the surface area as supervisors. There were seventeen participants.

3.2.2 Familiarisation with the research setting of the study

Prior to formal data collection, it was important to devote some time to familiarising myself with the AET environment in general and with the two departments in particular, i.e. Full-Time and Own-Time. Though my face was not unfamiliar within the mine, I knew that my presence would affect the pace of the facilitators' daily lives. Furthermore, because my fieldwork would include qualitative interviews and participant observation, I thought it would be important to make sure that the facilitators were comfortable with my presence. Some time was spent trying to gain their trust and building rapport.

As in any other qualitative study, the biases and assumptions of the researcher are embodied in methodological decisions, data analysis and in the writing process (Bakhurst, 2009:197). I was aware of these potential biases and attempted to keep them in mind when interpreting information and presenting results. Thus, I began my research convinced that my experience as an employee at this mine would aid my familiarity with the research field. Bias, commonly understood to be any influence that provides a distortion in the results of a study (Polit & Beck, 2014), is a term drawn from the quantitative research paradigm. Thirsk and Clark (2017:4) recently grappled with this issue of biases when discussing the contribution of hermeneutics for informing complex health-care interventions. They note that "the rigor of qualitative research is particularly vulnerable when it lacks some of the devices that have been employed in quantitative research to ensure that what is produced is not just well-composed rhetoric of a well-meaning, but biased, researcher's opinion". Thorne, Stephens, and Truant comment that most researchers "would recognize the concept [of bias] as being incompatible with the philosophical underpinnings of qualitative inquiry" (2016:2).

In the middle of research at the Full-Time AET centre, however, I faced a problematic situation due to the arrival of a new AET Full-Time centre manager. The old mine company was sold to a new mining company and the process of restructuring took place upon the signed agreement between the two mines. I often reminded myself of my position as a researcher. On my first encounter, it was noticeably clear that I was considered an outsider and was termed an investigator, which made some participants uncomfortable about sharing information, despite having met them the previous year on more than one occasion. After the proof of approval letters from the previous company were resubmitted, I was allowed to conduct research. This took some time with the back-and-forth e-mails that were exchanged with the relevant gatekeepers. The difficulties faced were recorded in my researcher's diary at the time. Fortunately, at the Own-Time centres I encountered the same familiar people I had interacted with the previous year in the context of my job.

While I became an increasingly familiar face within the Full-Time AET centre, and enjoyed the opportunity to interact with each participant, I adopted a very specific stance: I was here to watch and learn. Because the study's setting and participants were already familiar to me, I worked to see the Full-Time centre through new eyes. I made my researcher role explicit to the facilitators. Because of my extended presence among them (estimated one hour per day, from Monday to Thursday during lunch-time, for three weeks), not only was my presence familiar to the facilitators, but I was also able to conduct participant observation and interviews.

3.3 EXPLORING THE RESEARCH PARADIGM

A paradigm is best described as a whole system of thinking (Neuman, 2011:94). As TerreBlanche and Durrheim (2002:49) observe, the term paradigm refers to a research culture with a set of beliefs, values, and assumptions that a community of researchers has in common regarding the nature and conduct of research. In addition, Goduka (2012:126) posits that a paradigm is defined as the "entire constellation of beliefs, values and techniques shared by members of a research community". As a researcher, I interpreted a research paradigm as a guide to the prospects and realities of this study, which assisted me in organising and classifying data.

More specifically, the paradigm would include the accepted theories, traditions, approaches, models, frame of reference, body of research and methodologies applicable to the study. It could be seen as a model or framework for observation and understanding (Creswell, 2007:19; Babbie, 2010:32-33; Rubin & Babbie, 2010:15).

The paradigm thus embraces the basic set of beliefs that guided the action in this study. I view research paradigms as innately reflecting beliefs about the world people live in and want to live in. According to Sefotho (2015:23), a paradigm is thus a comprehensive belief system, worldview, or framework that guides research and practice in a field of study. From a philosophical perspective, Sefotho (2015) states that a paradigm comprises a view of the nature of reality (i.e. ontology) – whether it is external or internal to the knower; a related view of the type of knowledge that can be generated and standards for justifying it (i.e. epistemology); and a disciplined approach to generating that knowledge (i.e. methodology).

A number of studies illustrate how the subject of philosophy and paradigms in research pose a predicament and challenge to students in establishing the relevant paradigms to their research studies (Tuli, 2010:97). Tang (2011:211) categorically declares the paradigm issue as "warring schools and approaches" that are both "intimidating and confusing" and challenging to students in social sciences. Sefotho (2014:2) postulates that "[o]ne of the most outstanding challenges of usage forming part of the dilemma may be aggravated by how paradigm is used interchangeably with its pillar principles in the form of ontological paradigm or epistemological paradigm".

The interpretivist paradigm fits in the description of this research study as it seeks to find answers in a naturalistic, real, unobtrusive and non-controlling real-world situation (Tuli, 2010:100). It is argued, in agreement with Reeves and Hedberg (2003:32), that in the interpretive tradition there are no correct or incorrect theories. Reeves and Hedberg (2003) further note that the interpretivist paradigm stresses the need to put analysis in context. The predominant perspective is that meaning is constructed through interpretation of data as presented by participants who are the "social actors" and who draw understanding of "their world from their point of view" (Goduka, 2012:127).

The characteristics of interpretivism that were used in this study are categorised in Table 3.1. This table outlines the nature of reality (ontology), the nature of knowledge and the relationship between the inquirer and the inquired-into and the methodology (epistemology) used.

Table 3.1: Characteristics of interpretivism

Feature	Description
Aim of research	The aim of this study was to evaluate the impact of AET computer-based programme at the North-West Province mine (i.e. in the workplace).
Ontology	➢ There are multiple realities, including those sourced from the participants in this study. ➢ Reality can be explored, and constructed through human interactions, and meaningful actions, as it was done in this study. ➢ It can be discovered how people make sense of their social worlds in the natural setting by means of daily routines, conversations and writings while interacting with others around them. These writings could be text and visual pictures. It was discovered how participants in this study made sense of their world and programmes that they engage in. ➢ Many social realities exist due to varying human experience, including people's knowledge, views, interpretations and experiences, as was the case with participants in this study.
Epistemology	➢ Events are understood through the mental processes of interpretation that are influenced by interaction with social contexts. ➢ Those active in the research process socially construct knowledge by experiencing real-life or natural settings. Inquirer and the inquired-into are interlocked in an interactive process of talking and listening, reading and writing. ➢ More personal, interactive mode of data collection.
Methodology	➢ Processes of data collected by structured interviews, focus group and participant observation. This research was a product of my values and beliefs as the researcher.

It is my contention that knowledge and understanding are constructed when learners reflect and interact with computers. In Chapter 2, I mentioned and discussed activity theories underpinning this study, the zone of proximal development and the contradictions in activity theory.

The interpretivist paradigm reinforces the theoretical framework intended for the formation of foundational premises of this study. This is accounted for in section 3.4.2.

3.4 RESEARCH DESIGN

A research design is a framework or guide for the planning, implementation and analysis of the study (Sefotho, 2015:23). According to McMillan and Schumacher (2010: 20), a research design is the description of the procedures for conducting the study, including when, from whom, and under what conditions the data will be obtained. In my own understanding, a research design is a detailed plan and point of departure, intentionally and purposefully drawn by the researcher as a path to be followed in the quest to arrive at valid answers to the research questions. The planning provides structure for the research and "indicates the type of study undertaken" (De Jager, 2012:59).

The design therefore becomes important to connect the methodology and the appropriate set of research methods to address the research questions that have been established in Chapter 1. Wahyuni (2012:72), Maree (2007:70) and Terre Blanche and Durrheim (2002:29) state that a research design is a plan or strategy that moves from the underlying philosophical assumptions to specifying the selection of participants, the data gathering techniques to be used and the data analysis to be done. Yin (2003a:19) adds that "colloquially a research design is an action plan for getting from here to there, where 'here' may be defined as the initial set of questions to be answered and 'there' is some set of (conclusions) answers". In this study, the research design therefore was a set of guidelines that sought and discovered answers to the research questions.

The above discussion on research methodology and design, this study was a qualitative case study. Qualitative case study is participatory, field-based, interpretive, multifaceted and emergent (Creswell, 2003:175). A case study was appropriate for the exploration of the research problem under review. Furthermore, as an exercise of inquiry, a qualitative case study enables the understanding of social phenomena in authentic or natural environments. This study afforded me the opportunity to explore or describe a phenomenon in context, using a variety of data sources. Based on this view, the case study design was adopted for this study.

3.4.1 A case study

Yin (2003a:13) affirms that a case study provides an opportunity for discovery beyond that which is currently known. According to Shavelson and Towne (2002:99-106), the case study method helps to make direct observations and collect data in natural settings compared to relying on "derived" data. For this study, the unit of analysis was a group of people, individuals who shared a common object (or problem space) and who used tools to act on that object to transform it. In this study, a computer was a tangible object with rules, regulations and procedures used by adult learners who were appointed to different jobs under a division of labour. Those adult learners engaged with the computer during their AET classes for teaching and learning. As the learners engaged with the computer, they gradually built up the knowledge or skill and those skills became embedded in the day-to-day work exposure of some who use computers to execute their tasks at work.

The case study approach makes use of multiple methods of data collection such as interviews, document reviews, archival records, and direct and participant observations and subsequently renders "thick descriptions" of the phenomena under study (Yin, 2003b:278). The case study under review made use of individual interviews, participant observation, field notes and a focus group as methods of data collection.

The mine introduced the use of computers in AET classes for teaching and learning in the nineties and established a relationship with the service provider Media Works, a South African company that specialises in AET to provide them with the AET programme. Their curriculum includes computer-based or multimedia teaching and learning and face-to-face methodologies. The service provider uses Accelerate software, which is the platform that provides AET facilitators with what is required to present an outcomes-based lesson, powered by Navigate, a learning intervention management system (LIMS) used to track learners' work and manage aspects of the learning intervention.

The case study followed a qualitative research approach, which is a type of social science research that collects and works with non-numerical data and seeks to interpret meaning from the data to help us understand social life through the study of targeted populations or places. In a case study,

one or more cases can be investigated. When examining one case, we refer to a singular case study, and a multiple or plural case study is used to describe a study examining several cases. In this study a singular case study was explored. The intention of this case study was to spend six months from the time candidates were registered to enrol in the second term of the year. The regular attendees in this level formed part of this investigation, even though, according to the mine, Own-Time attendance is voluntary and Full-Time learners are relieved from their work to attend daily lessons. There were seventeen participants (volunteers) in this study, including four Own-Time and four Full-Time learners as well as five facilitators as the key people offering these studies, and four centre managers who oversee the delivery of the programme, which will be discussed in the findings (Chapter 4 of this study).

The case study was used to observe the AET learning process as it unfolded. I anticipated that the results would inform the mine that in the process of learning, some mine workers were transformed and gained new knowledge and skills, which would show a positive impact on their performance at work. This scenario assisted me to choose the type of case study which was guided by the overall study purpose. Yin (2003b:545) categorises various types of case studies, namely explanatory, exploratory and descriptive. He also differentiates between single, holistic case studies and multiple-case studies. Explanations and published examples of these types of case studies are provided in Table 3.2.

Table 3.2: Definitions of case studies (adapted from Yin, 2003b; Stake, 1995)

Case study type	Explanation
Explanatory	This type of case study would be used if you were seeking to answer a question that sought to explain the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies. In evaluation language, the explanations would link programme implementation with programme effects.
Exploratory	This type of case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes.
Descriptive	This type of case study is used to describe an intervention or phenomenon and the real-life context in which it occurred.

Case study type	Explanation
Multiple-case studies	A multiple case study enables the researcher to explore differences within and between cases. The goal is to replicate findings across cases. Because comparisons will be drawn, it is imperative that the cases are chosen carefully so that the multiple-case studies researcher can predict similar results across cases, or predict contrasting results based on theory.

A descriptive case study design was chosen to better understand the case at hand. Its primary interest was in the subjects who were participants in the activity system. The case study design was best applied because the research addressed descriptive questions aimed at producing a first-hand understanding of the impact of the computer programme on participating mine workers. This case study was bounded by indicating what was studied according to the updated information systems success model (DeLone & McLean, 2003:17) as seen in Chapter 2, Table 2.1. These boundaries indicated the breadth and depth of the study and not simply the sample that was included (Stake, 1995:547).

3.4.2 Activity system as a design framework

Activity theory is an alternative to behaviourist and cognitive theories of learning that view object and subject as separate. From an AT perspective, adult learners' actions are object-directed and cultural-historically mediated within a definable activity system. The activity system is the unit of analysis and the actions of the subject are viewed as mediated by the system in which the subject resides. Actions performed by the subjects are directed towards an object that is valued by the collective system as a component of the overall social activity or outcome. The mine used the computers to teach employees who were registered for the AET programme. The purpose of this initiative was to provide employees with workplace skills. Actions by the subject in the activity system are directed towards an object which is valued by the collective system as a component of the overall social activity or outcome. The components of the collective activity system were shown in triangular representation in Chapter 2, Figure 2.2. I found these components to be key concepts in the activity system which guided data gathering and analysis methods in this study (Engeström, 1999:294).

For this study, Engeström's model was adapted to develop the classroom observation template in Appendix E, which was relevant to guide data gathering. The third column, referred to as

"questions asked", explains how I used a particular component during observation and data gathering leading to the observation schedule. The activity system was identified and established as five AET facilitators, eight learners and four centre managers engaging with computers.

Activity theory focuses on tensions between the individual subject and the entire system as the stimulus for system and individual change and development. Emerging contradictions within the activity system create an environment where the system and the individual are in a state of constant change. Subsequently, the practices of the subject under analysis are moulded and then reshaped by changes in the system. The system was moulded and reshaped by changing practices among the subjects in this study (Engeström & Sannino, 2011:370).

Change occurs when the subject pauses for reflection, experimentation, and mediation; when a subject constructs multi-stepped procedures that redefine their individual actions within the activity system; and/or when a group of subjects creates, by design, a novel model for the activity system (Engeström, 2003:247). Understanding practices, tensions, and emerging practices in the learning process provided insight into the activity system in which adult learners at the mine engaged with computers as mediating tools for learning and development. Such insights provided adult learners the opportunity to learn alternative practices and policies that supported learning and better facilitating skills.

The subjects of the activity system were the participants who were using computers to support their learning. Both the object and the subject are transformed by the activity over time. Object is the component which distinguishes one activity from another. According to Engeström and Sannino (2010:1), an activity begins only when the image of an object or event capable of satisfying needs appears. The expanded object, in turn, works back on the artefacts and other components (rules, division of labour) in the system or related systems, and reshapes them (Edwards, 2009:5).

As a researcher, I believe that the object in the activity provides the possibility of understanding not only what people "are doing, but also why they are doing it". Activity systems are mutually reconstructed by participants historically using artefacts. Artefacts serve to mobilise participants

for improving collaborative activity and instructional processes (Halverson, 2006:229). Artefacts are material things with meaning established only in and through the activity of individuals in social practice (Blunden, 2007:253).

3.5 RESEARCH METHODS AND DATA COLLECTION

The term research methodology refers to the researcher's general approach in carrying out the research project (Babbie & Mouton, 2008:74). Mouton (2001:56) views research methodology as focusing on the research process and the kind of tools and procedures to be used. The point of departure would be the specific task (data collection) at hand, the individual steps in the research process, and the most "objective" procedures to be employed.

In essence, methodologies justify the methods that produce data and analyses and knowledge (Carter & Little, 2007:1317, 1320). Amongst the various kinds of research methods available, qualitative research was deemed suitable for this study. The selection of this approach was based on the nature of the research problem and the characteristics of qualitative research which were applicable to this research.

The theoretical and methodological framework for analysis and activities in the AET centres and computer labs include the eight-step model of Mwanza (2001) and Engeström (2003). In addition, the principle of explanation from Mwanza (2001) below was borrowed to consider similarities in expanding the object of the study espoused in Engeström's (2003) model. I took two approaches to applying activity theory (AT), one based on the questions found in Mwanza's (2001) work, the other based on the graphical representation of AT found in Engestrom's (1987) work. More progress was made using Mwanza's questions, though both methods showed possibilities of adding value.

a) Activity of interest

In this stage the learners modified the sort of activity in which they were interested. Each pair of learners sat at the computer to do an exercise on numeracy, working on converting numbers into percentages and medians using the mouse to click the correct answer in numerical order. During

the English computer-based lesson, each pair of learners sat at the computer to do an exercise to select verbs in the sentence in the computer-based lesson and also to use the mouse to click on the pictures in the lesson representing verbs (doing words). This activity enhanced learners' pronunciation, spelling, and meaning of words and mouse skills.

b) Objective of activity

Learners shared their feelings, needs and experiences while engaging with computers for learning. Facilitators expressed the aim which the learners were going to achieve through this activity.

c) Subject in this activity

Learners were involved in the activity and facilitators assisted the learners.

d) Tools mediating activity

Workbooks, whiteboard, textbooks, computers and the computer lab were the tools by which the subjects (AET learners) carried out the activity. At this stage learners demonstrated a deeper understanding of medians and converting numbers into percentages, identified verbs during English communication lesson and used verbs to form sentences.

e) Rules mediating the activity

Learners accepted the rules in the computer lab that all had to follow during the activity, for example: No eating or drinking was allowed in the computer lab, and learners had to shut down the computer at the completion of lessons.

f) Division of labour

All individuals involved were listed, e.g. Service provider, HRD Department and business operations who would be sending workers to attend the programme. The facilitator demonstrated how to hold a mouse and use the left and right button and what the two buttons can be used for. In addition, the facilitator showed the learners the QWERTY keyboard as an input device.

g) Community in which the activity is conducted

In this step the environment in which the activity was going to be carried out is defined. More specifically, the environment was the computer lab with adult learners enrolled for AET Own-Time in the mine.

h) Outcome

This is the final step in which the results of this activity and the transformation process noticeable in learners are assessed.

The purpose of using Mwanza's (2002:131) eight-step model was to drive the participants' activity towards the achievement of the AT outcome, which was to engage with computers to transform learning. This purpose will be highlighted in the discussion of the focus group interviews.

Mwanza further repackages AT by removing its elements from their place in Engestrom's triangles and presenting them as combinations (see Table 3.3).

Table 3.3: The elements of activity as a combination (adapted from Mwanza 2001)

Actors (doers)		**Mediator**		**Objective (purpose)**
Subjects	~	Tools	~	Object
Subjects	~	Rules	~	Object
Subjects	~	Division of labour	~	Object
Community	~	Tools	~	Object
Community	~	Rules	~	Object
Community	~	Division of labour	~	Object

The six combinations below then yield a new set of questions (Mwanza, 2001). These questions together with the eight-step model were instrumental in setting up the investigation.

- What Tools do the Subjects use to achieve their Objective and how?
- What Rules affect the way the Subjects achieve their Objective and how?
- How does the Division of Labour influence the way the Subjects satisfy their Objective?

- How do the Tools in use affect the way the Community achieves the Objective?
- What Rules affect the way the Community satisfies their Objective and how?
- How does the Division of Labour affect the way the Community achieves the Objective?

3.5.1 Selection of participants

The participants for this study were selected through consultation with the AET manager's office located in the mine. Permission had already been granted to use the mine employees and premises to access information for this study as indicated in Appendix B. Purposive selection was used, and a selection criterion was discussed and applied. Teddlie and Tashakkori (2003:713) define purposive sampling as a type of sampling in which particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be obtained from other choices. Thus, purposive sampling was deemed suitable for this study as only the participants, (and the facilitators and manager) described in the next paragraph were targeted as possessing information that would help answer the research questions.

The facilitators provided the names of all the employees enrolled for Own-Time and Full-Time classes so that I could familiarise myself with their names and, most importantly, determine who was available for participation in the study, especially for the interviews. All participants who met the criterion were selected by facilitators – those who were enrolled for AET Level 3 for Own-Time and Full-Time. The criterion was that those participants were expected to have completed AET Level 2 or some of the modules in that course.

The participants were listed according to their biographical information and progress in the AET course to date. Some were learners who were carried over from the AET studies class in 2015, others in 2016. Some were continuing, others had dropped out and then come back to continue where they had left off. The participants were contacted through the AET centre manager and facilitators and were notified a week before the formal meeting, considering their daily routine and how easy or difficult it would be for them to attend the session. I acknowledged their sacrifice in assisting in the progress of this study.

When the participants were contacted for the first time, they were provided with information about the study (without actually discussing the focus group questions or directly stating the aim of the study, as this could have reduced the quality of the session). Four learners were selected from Own-Time and the other four were selected from Part-Time, four centre managers and five facilitators, since this study comprised two AET environments for teaching and learning, as discussed in Chapter 1, paragraph 1.3. A total of seventeen participants were interviewed. Knowledge of the two environments provided information about how the participants were being taught in the same learning areas but at different times, and the rationale behind this arrangement. Full-Time learners attend classes for four months per learning area and write examinations, whereas Own-Time learners attend classes for the same learning area for six months and then write examinations.

3.5.2 Data collection instruments

The key concepts of AT were chosen to generate a practicable method of data collection for examining the activity system of learning through the use of computers at the particular mine in the North-West Province chosen for this study. Activity theory located the activity of learning in the social and cultural context of the mine community. During this phase of the study, formal data collection took place over a seven-month period between October 2016 and April of 2017. I became a participant-observer in both Full-Time and Own-Time classes, devoting myself to studying AET practices within these departments.

This mine consists of three conventional mines and one mechanised mine, which are called Operations. The term “Operation” refers collectively to mining business units and service organisations. Each operation is attached to an AET Own-Time centre, and there is only one centrally located Full-Time AET centre. A total of four AET centres were selected due to the nature of the mine.

The data collection instruments included interviews, participant observations, focus group interviews (refer to Appendices E, F, G and H) and field notes. The interview guides helped with the constant review and updating of the data with new information that was gathered each time. A new understanding of the activity system/disturbances/systemic contradictions of the AET

departments led to a new starting point to do further participant observation. This procedure was repeated during the data collection.

Open-ended questions were formulated based on the various components of the activity system by translating each component into a question where possible whenever interviewing or observing participants during practice. The observation tool enabled the data collection (as recommended by Kelly (2010:287), i.e. getting to know the phenomenon in its real context and applying interpretive beliefs that prevented me from disturbing the context unduly, but which allowed me to become a natural part of the context in which the phenomenon occurred). The subjects of the activity system who were the focus of this study were adult learners using computers to support their learning. For the tools to function, the subject must be engaged in the transformation process and be able to use the computers effectively.

Interview guides were useful in conducting the interviews with the facilitators and centre managers individually, as presented in Appendix F and Appendix G, and also with learners, as shown in Appendix H. The interview guide was used as well as a voice tracer for recording the interviews. When designing the interview guide, it was imperative to ask questions that were likely to yield as much information about the study phenomenon as possible and also to address the aims and objectives of the research. Due to the qualitative nature of this study, neutral, sensitive and intelligible open-ended questions (which required more than a yes/no answer) were asked. I started with questions which subjects of the activity under investigation could answer easily and then proceeded to questions requiring deeper thought. The rationale behind this technique was first to put the respondents at ease, build up their confidence and create rapport between them and the researcher. This provided rich data that subsequently facilitated the further development of the interview.

The interview guides (see Appendices F, G and H) covered the three components of Engeström's model and development of an activity system, namely subject, object and community. For example, facilitators were asked "How do you provide support for learners who are seeing the computer for the first time? How do you ensure that they stay committed to using computers for learning?" (See Appendix F). Facilitators were the community in Engeström's model whose

responsibility was to teach learners in this study. Contradictions were considered in the activity system, for example, by asking learners, "Do you use the computer during this AET programme and does your job require that you use the computer to execute your tasks?" (See Appendix H). Learners were subjects in Engeström's model who executed the task using the computer to achieve the outcome. The computer was the object used by learners for learning and used by facilitators for teaching. Also, during participant observation the focus was on the activity theory principle. Field notes were taken to describe learners' behaviour and signs which showed internalisation of computer-based learning.

Table 3.3 shows how data collection instruments were used to address the sub-questions stated in Chapter 1, section 1.3.

In this section, the focus is on the qualitative methods that I employed for the collection of data, the role of participant observation, structured interviews and the focus group.

3.5.3 Participant observation

Participant observation was the process that assisted me in this study to learn about the activities of the people under study, in the natural setting, through observing and participating in those activities. I assumed the role of participant observer who interacted with participants as they integrated computers in their learning. From the AT perspective, I acted as the subject in the activity system of data collection, using different tools such as the observation template, and making field notes. Participant observation made me active during the process and helped me to interact with participants in the presence of the facilitator for an understanding of what I was looking for. According to the prepared observation schedule, participant observation lasted for ten weeks, of which five weeks were allocated for the Own-Time learning environment for English communication and Numeracy for face-to-face and computer-based learning. The same process was followed in Full-Time for five weeks. Observing participants and interacting with them during their classroom activities helped me to avoid artificial questioning and encouraged interaction as the sequence of events unfolded.

Naturalism was observed, which means that as a "subject" in the activity of data collection my aim was to capture all participants' behaviour during engagement with computers in the natural setting, the computer laboratory/room, as it was meant for a particular activity, without interfering or influencing the engagement interaction. I ensured that I did not jeopardise the validity of the results. The observation template (See Appendix E) was used to represent Engeström's model. Arrangements were made with the centre managers for participant observation for Own-Time and Full-Time classes. I spent an hour in an afternoon and a series of afternoons in a particular setting for approximately two months in Own-Time and Full-Time. The plan was to spend a month collecting data but it was extended to two months. As a researcher, I immersed myself in the context to facilitate prolonged engagement, which is one of the activities recommended by Lincoln and Guba (1994:398) in Denzin & Lincoln (2005) to establish trustworthiness.

These prolonged interactions with the AET community provided me with more opportunities to observe and participate in a variety of activities over time. I became a complete participant, who was a member of the group being studied and I did not conceal my researcher role from the group to avoid disrupting normal activity. The group being studied was aware of the observation activities, which was the most ethical approach.

During one of the observation activities, learners were given an extract adapted from a magazine during an English communication lesson with the title "It can be done", which I read out to the learners. True or false questions were asked, as well as direct and indirect speech, nouns and pronouns. I explained and gave the meaning of key words such as *entrepreneur*, *a smallholding*, *franchise outlets* and *horticulture*. The extract was about an epic improbable journey of a young man who had no anticipation of an entrepreneurial future growing up; however, through perseverance he became a franchisee. Participants were asked to give an account of their understanding of the extract, and their pronunciation was corrected, and the meaning of new words was explained.

The key concepts pertaining to this observation method were participation, collaboration and engagement (Henning et al., 2004:297). For instance, I actively participated during the mathematical literacy class and explained the importance of writing numbers in ascending and

descending order. I also showed adult learners how to determine the median and a range as well as calculating the average and percentages using the computer. The specific duration of participant observation depended on the setting, activity and population of interest.

Informal interviews were conducted with the participants, taking the stance of a child in need of information about lessons conducted. It became a habit to include specifics like date, day and time along with a simple coding system for keeping track of my entries. Notes of the physical map of the setting and description of the physical surroundings and a portrayal of where participants were positioned over time were made. This assisted in identifying a group that participated actively in class and those who did not.

The anonymity of the participants was preserved in the final write-up and in field notes to prevent their identification, should the field notes be subpoenaed for inspection. I participated in action for the complete understanding of the activity. DeWalt and DeWalt (2002:176) state that participant observation is characterised by an open, non-judgmental attitude, being interested in learning more about others, being aware of the propensity for feeling culture shock and for making mistakes, most of which can be overcome by being a careful observer and a good listener, and remaining open to the unexpected in what is learned. The degree to which the researcher may participate is determined by the researcher or by the community (DeWalt & DeWalt, 2002:24, as adapted in Appendix E).

3.5.4 Interviews

Interviews were developed to cover the components and development of the activity system. Interviews are methods of gathering information orally using a set of pre-planned core questions or an interview guide. According to Shneiderman and Plaisant (2005:580), interviews can be very productive since the interviewer can pursue specific issues of concern that may lead to focused and constructive suggestions. The advantage is that there is direct contact with the interviewees, and detailed data is gathered. Depending on the need and design, interviews can be unstructured, structured, and semi-structured with individuals, or may be focus-group interviews. For this study, more insight into people's opinions, feelings, emotions and experiences was needed.

The reason for the choice of structured and focus group interviews for this study (see Appendices F, G and H) was motivated by Le May and Holmes (2012:87), who state that interviews are a valuable method of collecting information about a variety of topics in most qualitative approaches. Interviews allow entrance into another person's world and are an excellent source of data (Speziale & Carpenter, 2007:95). The component parts of interviews comprise asking questions, active listening, reflecting on answers and non-verbal cues, the skilled use of nonverbal and verbal communication, and the ability to interpret responses to appropriately frame the next question (Le May & Holmes, 2012:83). These helped in conducting the interviews in a manner that would yield the needed information.

3.5.4.1 Structured interviews

Structured interviews are standardised and follow a fixed format in which questions are asked in a specific order (McMillan & Schumacher, 2006:351). It was this format that guided asking every participant interviewed the same set of questions in the exact same manner. By so doing, the trustworthiness of the interviews was increased. Focus was on the questions listed in the interview guide.

Interviews were scheduled for selected adult learners of Full-Time classes during their lunch time in a period of a month. For Own-Time participants, interviews were scheduled after afternoon classes for an hour and lasted approximately two months due to the nature of their work and interruptions such as meetings scheduled after work by either management or union representatives. Participants were shift workers and would not attend classes when they had fatigue from work, while others had other commitments to attend to and did not attend classes.

Learners attend Own-Time classes of their own free will, because attendance is voluntary. Their voluntarism poses a challenge for facilitators who sometimes wait for hours for learners who often do not arrive for lessons. Centre managers and facilitators were interviewed during their lunch-time and the interviews were conducted in a period of a month for Own-Time and a month for Full-Time learners as they were members of the community depicted in Figure 5.1 and teaching the subjects, i.e. the learners in this study, through the use of computers. Few close-ended questions and more open-ended questions were included in the structured interviews with the aim

of allowing interviewees to express their opinions and ideas in their own words. Close-ended questions provide "preset response options for the participant" and they are useful in protecting the participants in "sensitive questions because participants might feel more comfortable knowing the parameters of response options" (Creswell, 2005:363-364). Open-ended questions let "participants provide their own responses to questions" (Creswell, 2005:363). The participants were therefore given the opportunity to express themselves using their own words, especially when asked open-ended questions.

The access granted to see participants was arranged with the centre manager and facilitators to enter the mine. For accuracy, a digital voice recorder and back-up recorder were used for recording the responses of the participants, after which transcripts of the data were produced, augmented by my notes. In the notes, observations about the interview content, the participants, non-verbal content such as gestures and facial expressions and the context were documented. All the interviews took place on site. Before the structured interview was conducted, the focus and objectives of the research were explained to the interviewees. The participants were interviewed face to face from the interview guide. Thus, the pre-determined set of questions were asked using the same wording and order of questions as specified in the interview guide attached in Appendix F. The interview questions were kept simple and straightforward, with limited interruptions from my side.

The derogatory language called "Fanakalo" is an unofficial language used in the past to communicate in the South African mines with a functionally illiterate workforce. The majority of underground workers were migrant workers and were illiterate. However, the underground workers who currently attend AET classes at this mine are mostly able to communicate in English, and speak more openly and with confidence. "Fanakalo" was abolished because the mine realised that retention and personal development were amongst the projects they needed to undertake to change the lives of their employees. However, some underground workers still use that unofficial language for communication in the linguistically diverse environment of the mine. The mine has since focused on education and self-development and that was what AET was designed for. The interview questions were not phrased in the participants' home language, but were constructed in

simple English as the medium of instruction for teaching and learning used at the mine. The guidelines in Table 3.4 helped in the facilitation of the interviews.

Table 3.4: A guide for questioning during the interview

Type of question	Purpose
Opening questions	To identify the characteristics that the participants have in common. Participants should be given an opportunity to introduce themselves.
Introductory questions	To introduce the general topic of the discussion, and to stimulate the conversation and improve interaction in the group.
Transition questions	To move the participants into the focus of the discussion.
Key questions	Concern about the focus of the interview.
Ending questions	Give the participants an opportunity to make final statements.
Final questions	Ask the participants to add things they think have not been considered during the discussion.

3.5.4.2 Focus group interview

A focus group interview is a research method that collects data through group interaction on a topic determined (De Vos, Strydom, Fouché & Delport, 2005:306). Babbie and Mouton (2001:248) and Edenborough (2002:109) explain that a focus group is a group of people who are brought together in a room to engage in a guided discussion. This method was chosen for data gathering in the study. This choice was informed by the fact that it explores people's experiences, opinions, wishes and concerns (Litosseliti, 2003:16). The focus group provided insights into how the participants in this study thought and provided a deeper understanding of their programme of study.

The purpose of gathering participants was to get as many ideas and perspectives on the topic under discussion as possible. The focus group was made up of eight adult learners from Own-Time and Full-Time selected through purposive sampling.

In these focus groups, responses were flexible and participants were encouraged to reply at length. As a result, the sessions were not tightly structured. The primary aim was to try to understand the participants' views and experiences even wider about the training that they received. Forcing them into answering questions in particular ways was avoided at all costs, as it was not possible to

predict how they would want to answer a particular question. Participants were allowed to respond to open-ended questions in any way they wanted, while ensuring that the questions asked did not give away the type of answer required.

3.5.5 Field notes

Prior to the beginning of the study, I used an approach to field-note collection that is congruent with the chosen theoretical framework and the methodological approach. The theoretical framework and methodological approach helped me to define the nature of knowledge, which directed the line of inquiry and the value I placed on the different sources of information (Mulhall, 2003).

Field notes were crucial to understanding Full-Time and Own-Time practices and building those departments' activity systems. In doing so, the initial field observation guide provided the ability to systematically record participants' actions, the reasons for the action, the specific division of labour involved, and the associated community. Creswell (2013) encourages field notes for qualitative study to enhance the data and provide a rich context for analysis. Field notes were created during the performance of qualitative fieldwork to recall the behaviours, events and activities that took place during observation.

The purpose of field notes was to identify the common ground to yield rich information about the activity system as the unit of analysis. Field notes recorded the following components of the system:

- Subjects, i.e. who does what in the activity system.
- Rules that constrain and justify the actions inside the department.
- Purpose of actions as determined by interviews.
- Division and distribution of the tasks and status relations between participants.
- Disturbances or different opinions and points of view expressed within the department (tensions).

3.6 DATA ANALYSIS AND INTERPRETATION

Data analysis is a way of understanding what the participants' thoughts are, how they feel, or what they did in some situation or at some point in time. According to De Vos, Strydom, Fouché and Delport (2011:335), data analysis is a method of categorising, ordering, manipulating and summarising data to attain answers to a specific research question. A number of methods can be used to analyse qualitative data, which include typology, grounded theory or constant comparison. There is also matrix/logical analysis, which predominantly involves the use of flow charts and diagrams. Other qualitative data analysis methods include metaphorical analysis, hermeneutical analysis, discourse analysis, semiotics, content analysis, phenomenological/ heuristic analysis, and narratological analysis (Ratcliff, 2011:1).

Bogdan and Biklen (2003:298) define qualitative data analysis as "working with the data, organising them, breaking them into manageable units, coding them, synthesising them, and searching for patterns". The aim of analysis of qualitative data is to discover patterns, concepts, themes and meanings. The following three steps were reflected in analysing the data:

- Data were prepared and conceptualised according to the structure grounded in the seven components of Engeström's activity system (see Figure 2.4).
- Using the concepts of AT, several disturbances were identified, which helped to build categories of analysis (see Figure 2.6).
- Once identified, described and analysed, each disturbance enabled connection with systemic contradictions that arose within the larger AET activity system.

In this study, the analysis was understood as a process that began from data collection until the final writing of the case study. In case study research, Yin (2003b:198) discusses the need for searching the data for "patterns" which may explain or identify causal links in the database. In the process, the researcher concentrates on the entire body of data first, then attempts to take it apart and re-constructs it again more meaningfully.

Components of Engeström's activity system were interpreted to understand their dynamics. I looked at recurring contradictions which appeared mostly in the three components used in the interview guide, namely subject, object and community, and how they came about in the complex interactions between the activity system components as explained in Chapter 2. Then I compared the activity system against these three components to describe how learners internalise aspects of engaging with the computer in the AET programme and how they externalise these aspects through their cultural background and beliefs.

Categorisation assisted in making comparisons and contrasts between patterns to reflect deeply on certain patterns and complex threads of the data and make sense of them. During this process, what made these pieces of data different and/or similar to other pieces of data were considered. This method of analysis was inductive, as I began to examine data critically and drew new meaning from the data rather than in a deductive approach, which defines at the outset what will be found (McMillan & Schumacher, 2010:367).

The process followed for data analysis was as follows:

- I typed data on the left quarter of a page and left the remaining three quarters of the page open for notes.
- In the event the topic of the data changed, I started a new paragraph to accommodate changes.
- A verbatim transcription of the interview for Own-Time and Full-Time was given.
- The coding process started during data collection, bearing in mind that the codes might change at a later stage.

Data triangulation involved using different sources of information by identifying stakeholders in the AET programme to increase the validity of the study. These included community members who have benefitted from this AET programme, supervisors who have learners who have been promoted after completing the studies offered at the mine, as well as learners who have completed the studies and have been promoted to a level above the current. Alphabetical letters and numbers were allocated to the focus group interviewees as their pseudonyms to ensure their confidentiality.

Letters and numbers such as P1, P2, P3, and P4 were used. The carefully selected interviewees' responses to each question were presented verbatim and in italics to substantiate the findings, which were grouped into common patterns and themes detailed in Chapter 4.

3.7 TRUSTWORTHINESS OF THE STUDY

The trustworthiness of the interpretations and the findings depended on being able to demonstrate how they were reached (LaBanca, 2004:321). The significance of trustworthiness, therefore, is that it cements the validity and credibility of the findings of a study while also providing checks and balances to maintain acceptable standards of scientific inquiry (Bowen, 2009:27). Credibility refers to the extent to which the results approximate reality and are judged to be accurate, trustworthy and reasonable (McMillan & Schumacher, 2010:102). In addressing credibility, an endeavour was made to present a true picture of the phenomenon under scrutiny. To ensure that credibility was achieved, two days per week for three weeks were spent with the participants. This prolonged engagement (McMillan & Schumacher, 2010:102) with the participants helped me to gather sufficient data as trust and confidence were built during that period.

It was important to indicate the possibility of the intrusion of my assumptions as an employee at the mine in the North-West Province. Validity was exercised by incorporating bracketing and rigour. Given the sometimes close relationship between the researcher and the research topic that may both precede and develop during the process of qualitative research, bracketing and rigour were methods used to ensure validity and to separate what may be emotionally challenging material.

3.7.1 Bracketing

Drew (2004:215) describes bracketing as "the task of sorting out the qualities that belong to the researcher's experience of the phenomenon". Gearing (2004:1430) describes bracketing as a "scientific process in which a researcher suspends or holds in abeyance his or her presuppositions, biases, assumptions, theories, or previous experiences to see and describe the phenomenon". According to Chan, Fung and Chien (2013:2), bracketing is holding in abeyance the researcher's

own “repertoires of knowledge, beliefs, values and experiences in order to accurately describe participants’ life experiences”.

As indicated in this study, as an employee at this North-West Province mine, I am responsible for managing, coordinating, and monitoring HRD targets and progress on a monthly and quarterly basis, of which AET forms a part. During reporting, I interact with different stream leaders including AET managers. The views of bracketing in this study are presented from this experiential perspective. This programme’s main aim was to evaluate the impact of AET computer-based programmes at the North-West Province mine (i.e. in the workplace). The purpose was also to explore how initial engagements with the AET computer programmes reflect possible change in the epistemology in the practice of teaching and learning within this context. The main activities have to do with face-to-face teaching and computer-based learning.

It was particularly important for me as a researcher to introduce bracketing at the initial stage of the research process when the study was first conceptualised and to continue with the process of bracketing throughout the research (Rolls & Relf, 2006:286). The rationale behind this was that preconceptions arising from personal experience with the research material were examined prior to undertaking the research study so that they could be monitored throughout the research endeavour as both a potential source of insight as well as potential obstacles to engagement.

Simultaneous bracketing with participants would have been appreciated. However, it was uncertain whether participants would be able to bracket their own preconceptions. Despite this presumption about participant bracketing, during data collection when conducting the interview, it was assumed that the participants brought their preconceptions or displayed their intentionality towards the phenomenon.

The methods which were used for bracketing included making notes intentionally to acknowledge and foreground my perceptions and presuppositions. These notes served as a reminder to engage more extensively with raw data provided by participants, which assisted me in sustaining my position as participant researcher. During the data collection phase, to denote thoughts and feelings, observational comments, memos and theoretical notes were written and kept. Memos

were used to expound the reasoning process of conducting research, methodological notes that expounded the procedural aspects of the study, and observational comments that allowed exploration of feelings and efforts put into the study. Rigour was another aspect that contributed to validating this study.

3.7.2 Rigour

Rigour is an important concept in research because it accounts for trust of one's research in the eyes of peers and readership. It is synonymous with the validity, or even with the quality of the research (Melrose, 2001:163-164). It also means precision, accuracy, exactness, something that is scientific and unerring (Roget, Roget & Roget, 1980 cited in Melrose, 2001:164).

As part of the HRD team at the mine, I employed precautionary measures to ensure rigour by minimising subjectivity. I strived to record and interpret data with integrity and honesty. In this instance, it was a challenge not to impose my views and preconceptions on the data. Therefore, the "I" had to make a provision to strive to record and interpret the data with integrity and honesty in this study. Data collected from participant's data wer not judged against my own values or existing knowledge. The coding of information was developed strictly from the participants' interview transcripts.

While participants' transcripts were read, matters that became of interest, such as words and expressions frequently used, were identified. To gain more understanding, pointers such as the repetition of words, situations, comparisons and expressions were noted. I observed and noted points of concern raised during the interviews and their frequency.

3.8 ETHICAL CONSIDERATIONS

Ethical matters refer to the beliefs and standards that guide the researcher throughout the study to honour professional, personal and behavioural conduct, as well as demonstrate protection and respect for participants (De Jager, 2012:91). De Jager contends that these standards relate to "beliefs about what is right or wrong, proper or improper, good or bad" when conducting research. A number of ethical stages were followed prior to data collection to ensure compliance with the

ethical considerations of my institution and general research principles. To conduct research at this particular mine in the North-West Province, I directed the application to the mine's corporate head office, which is based in Johannesburg, Gauteng Province. To access the research site in the mine an application was sent to the Head of Department (HOD) for AET at the mine, and it was further cascaded to centre managers, facilitators and adult learners (see Appendices A to C).

This step was considered an added measure to protect the participants and the researcher, as well as to encourage total commitment and professionalism on the researcher's part. The mine where the research was conducted assessed whether I had satisfied its research ethics requirements, after which it granted permission to conduct the study at its operations in the North-West Province. After the University of South Africa through the College of Education granted the ethics clearance, I gained access to the mine's operations (shafts). Application for ethical clearance was also submitted to the College of Education at the University of South Africa. The ethical clearance certificate was granted in this regard (See Appendix J). I subsequently visited the mine's operations (shafts) to familiarise myself with the AET setting or culture. When presenting my case, I requested that the four AET centres to be used for the study should be giving Level 3 classes.

Entering the field involved choosing a site, gaining permission, selecting key informants, and familiarising myself with the setting or culture. In this process, a site which could facilitate easy access to the data were chosen. The objective was to collect data that would help answer the research questions. To assist in gaining permission from the centre managers on site to conduct the study, I brought a letter of introduction for ease of entry, such as information about my study, institution, and planned length of time in the field.

An agreement between the gatekeepers and me detailed a delimited substantive problem that required an equally delimited access to data. The positive influence of the gatekeepers was invaluable to the research process. They facilitated the smooth running of the research activity. Participants at the mine were duly informed about the purpose of this research and their voluntary participation was requested (See Appendix D). This ensured that participants had the right to be informed that they were being researched and had a choice to participate or not (Richards &

Schwartz, 2002:137). This is consistent with the argument of Richards and Schwartz that informed consent is a prerequisite in all research which involves identifiable participants, except in cases where the ethical committee judges that such consent is not possible or that the benefits of research outweigh the potential harm (see Appendix D).

3.9 SUMMARY

The research design for this study was a case study that was carried out through qualitative methods. The research design and methodology played a central part because they guided the strategies of data collection and their use in the data gathering process, which was informed by the chosen paradigm. Measures to ensure trustworthiness also received attention. In addition, this chapter discussed the method of data analysis and ethical considerations.

Chapter 4 presents the data analysis and findings of the study.

CHAPTER 4
DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 INTRODUCTION

The aim of this study was to evaluate the impact of AET computer-based programmes at the North-West Province mine (i.e. in the workplace). A case study design was used to obtain a rich, detailed insight into the life of that case and its complex relationships and processes (Basharina, 2007:82). In Chapter 2, theoretical perspectives on tool mediation, activity theory (AT) and the information systems success model, which underpinned this study, were discussed. Due to their pragmatic nature, these theories were merged by the configurations articulated in Chapter 3 and their worth in providing direction to the data analysis and interpretation in this chapter.

The research protocols used were developed within the parameters set out in the description of the data gathering process. This process involved explaining and interpreting the interaction in the activity system using the eight-step model to analyse the unfolding of object-oriented subjects, boundary crossing, the zone of proximal development, and lastly the significance of contradictions.

The basic steps and engagement with data processing entailed transcribing, reading, categorising and developing emerging themes for analysing and writing up the findings (Williams, 2007:65). The steps highlighted by Creswell (2012:261) were used to identify text segments and to assign code labels to the segments based on the meaning the researcher discovered in the text segments. Engeström's activity system as presented in Chapter 3, Figures 3.1 and 3.2, was used in the analysis of data, including disturbances and contradictions highlighted in section 4.4. Objective views were recorded as reflections of what actually happened, paying attention to relevant aspects related to the study (Babbie & Mouton, 2001:294).

Data patterns were included which explained or identified causal links in the database (Yin, 2003b:198). In identifying comparisons and contrasts between patterns to reflect deeply on certain patterns and complex threads of the data, categorising the data were indispensable. Data were

taken apart and reconstructed more meaningfully to reflect on emerging patterns and complex threads and decipher them. At this stage, what made the pieces of data different or similar to other pieces of the same nature was looked at. Pseudonyms were assigned to all participants to ensure confidentiality, as promised in Chapter 3.

In the following sections, the biographical details of the participants are presented. Thereafter, the description of the qualitative data as per the methods of data collection is presented. Participant observation, referred to as the leading data collection method in this study, was foregrounded in the presentation of the findings because it produced many valid and important results relating to facilitating/teaching and learning practices in the classroom and computer lab. Participant observation was important in understanding what took place in the classroom, including how learning and development occurred, both for teachers and learners (Hoadley, 2012:188; Stuhlman, Hamre, Downer & Pianta, n.d.:2; Zimmermann, 2014:2). Tables 4.1 and 4.2 capture the participants' biographical data from which the characteristics of participants are defined.

4.2 PARTICIPANTS' BIOGRAPHICAL INFORMATION

The biographical information of participants was considered indispensable for providing evidence regarding the legitimacy of their participation as well as to document their history. Data of this nature has a functional basis, making important background information available for analysis and supporting self-contained analyses (Frick, Groh-Samberg & Lohmann, 2008:2). The biographical data presented genuine and pertinent information, which was useful in the construction of knowledge and understanding of the phenomena and responses to the questions modelled.

The following biographical information was derived from the first section of the interview guide. Of the seventeen participants, five were facilitators; four were centre managers and eight learners. Table 4.1 captures the biographical data from which the characteristics of participants, in this instance facilitators/teachers and centre managers, are defined in terms of gender, race, age range, employment status, qualifications, and designation.

Table 4.1: Facilitators'/teachers' and centre managers' biographical data

Participant	Gender	Race	Age Range	Employment status	Qualification	Designation
P1	M	B	A	Contractor	AET Certificate	Full-time Facilitator
P2	F	B	A	Contractor	Diploma in AET	Own-time Centre manager
P3	F	B	A	Contractor	Cert. in AET and Human Resource Cert. and Train the Trainer Cert.	Own-time facilitator
P4	F	B	B	Contractor	Diploma in AET	Full-time facilitator
P5	M	B	B	Contractor	Diploma in AET (studying towards a B.Ed.)	Own-time facilitator
P6	F	B	C	Permanent Employee	Teachers Diploma, and B.Ed	Own-time Centre Manager
P7	M	B	C	Permanent Employee	Teachers Diploma, and B.Ed.	Own-time Centre Manager
P8	M	B	E	Permanent Employee	Grade 12	Full-time Centre Manager
P9	F	B	C	Contractor	Diploma in AET	Own-time facilitator

Key:

- P1-P9 participants in this study
- Age range: A: 30-35; B: 35-40; C: 40-45; D: 45-55; E 55-60
- Race: B (Black), C (Coloured), W (White), I (Indian)
- M: Male
- F: Female

Table 4.1 shows a fair balance of participants in terms of their gender and employment status. The participants were all black and their ages ranged between 30 and 60 years. The participants' education ranged from Grade 12 to a degree qualification. There were more Own-Time than Full-

Time participants because Own-Time facilitators are employed on the Media Works contract, which is renewable based on various circumstances.

The biographical information above is complemented by the participants' explanation that upon signing on with Media Works they received training in the teaching methodology courses as well as multimedia courses, which gave them a step-by-step guide to presenting lessons and expediting learning. Remediation and extension of ideas enabled the facilitators to extend learning beyond the realm of the training classroom. That is where learning began to change the lives of adult learners at this mine. Six participants, i.e. P1, P2, P3, P4, P5 and P9 were not professionally qualified. However, these participants had obtained certificates and diplomas in AET from various institutions. One contract facilitator had obtained a Human Resources (HR) certificate and train-the-trainer certificate.

Apart from the Media Works employees included in Table 4.1, the other three participants (P2, P6, P7, P8) were permanent mine employees. The oldest in the group was the Full-Time centre manager, who held a Grade 12 certificate. Two centre managers for Own-Time held bachelors' degrees and were professionally qualified teachers who came to the mine with more knowledge and experience in teaching and learning delivery methods. Both were in the same age group. The male Own-Time centre manager revealed during the interview that he had taught English at high school in most of his teaching experience, and the female Own-Time centre manager had taught Mathematics and Science in most of her teaching experience at middle school. In view of this study, Makhila (2008:28) argues that subject-specific qualified, experienced and motivated teachers do well in offering quality education by bringing high levels of subject knowledge and instilling high-level skills in learners. The third Own-Time centre manager had a Diploma in AET.

The terms teachers and facilitators were used interchangeably. Much as they taught subjects, the facilitators were divided in terms of their professional titles. Those who had taught in public schools before were teachers by profession and preferred to be called teachers. The other half had taught in industry training and since they were Education, Training and Development (ETD) officers by profession, they preferred to be called facilitators of learning.

Table 4.2 presents learners' area of work. This information was significant, revealing that most of the adult learners enrolled in this programme were underground mine workers and had enrolled in this programme to obtain qualifications and acquire new skills needed for better jobs and the possibility of promotions. Of the eight participants only two learners worked on the surface in surface-related jobs. Two female and six male learners were available to participate in the focus group interview, taking into consideration that participation was voluntary. The classes at all centres had a larger number of males than females. Four of the participants were between the ages of forty and forty-five, and one male who was between age fifty-five and sixty was the oldest. The youngest was between the ages of thirty and thirty-five. All these participants were black.

The learner participants' highest level of education was AET Level 2. When this study was conducted, they were enrolled for Level 3. Table 4.2 also reveals that underground work is not only for males at this mine; female workers also occupy positions based underground. The table further shows that all these adult learners who had enrolled for either Own-Time or Full-Time were permanent mine employees and not contract workers. The number of learners who participated in the focus group interview, as shown in Table 4.2, was equitably distributed, i.e. four from each AET environment, to provide a good background of both worlds.

Table 4.2: Own-Time and Full-Time learners biographical data

Participant	Gender	Race	Age Range	Employment status	Work Centre	Designation
P10	M	B	E	Permanent Employee	Underground	Full-time Learner
P11	F	B	C	Permanent Employee	Underground	Full-time Learner
P12	F	B	A	Permanent Employee	Underground	Own-time learner
P13	M	B	C	Permanent Employee	Underground	Full-time Learner
P14	M	B	C	Permanent Employee	Surface	Own-time Learner
P15	M	B	D	Permanent Employee	Surface	Full-time learner
P16	M	B	C	Permanent Employee	Underground	Own-time learner
P17	M	B	B	Permanent Employee	Underground	Own-time learner

4.3 FINDINGS FROM PARTICIPANT OBSERVATION

The findings revealed that group work among learners was an important component of a workplace adult learning process. The understanding of this study is that group work provides adult learners with experiences, opportunities for self-discovery, direction and safety for learners who are struggling with complex concepts and skills.

In the mornings at five, underground workers are already at change houses to change into work wear to start the day. When they arrive at their various workstations, these adult learners create an atmosphere conducive to biblical scripture reading and self-expression, unaware that they have developed communication, interpersonal, creative and analytical skills. Participant observation served as the bridge between the worlds of theory and practice (Reed & Bergemann, 2001:176). On the other hand, participant observation assisted in realising a great deal about the how and why some theories and methods work or do not work. Participant observation occurred in three areas, i.e. workplace activity, classroom activity and facilitator activity.

4.3.1 Workplace activity

Before any work shift was started, a safety awareness briefing was conducted, which was a platform to discuss incidences that had occurred on the previous shift and how they could be prevented. The safety briefing session was compulsory for all staff members of the particular work section, including supervisors and safety representatives. The safety manager would confirm the status of the operation, the operational report from the previous shift would be read to staff members and a report presented confirming that the previous shift was cleared. If there were any mine accidents, they would be reported on that platform.

Safety would be at the helm of the report. Former and present AET members who were safety representatives would be identifiable in the meetings in their work clothes; yellow overalls and pink hard hats. These safety representatives had been given a mandate to give work instructions and encourage employees as a priority to stop with what they were doing if it was not safe to continue with work. They further explained the risks associated with the tasks carried out when it was not safe to do so. As employees attend the AET programme they become literate and can also understand the meaning of various danger signs to avoid accidents.

Work team meetings were held daily as a platform for information sharing and awareness sessions. It was a practice which is encouraged at the mine on a day-to-day basis to read bulletins and notices regarding company/work related issues. Reports at all operations were written in English to encourage all to use English for communication. Reports that were e-mailed were shared with supervisors and those who had access to e-mails as events unfolded.

Participants in this study were able to respond and communicate in English with supervisors and fellow colleagues. These participants in AET Level 3 were able to help each other to complete leave forms on hard copy and electronically with the assistance of the participant observer; hence they were taught how to complete the forms independently. They also helped one another to read and understand their pay slips on pay day. The participants showed their mathematical competency using computers and hand-held calculators to compute overtime shifts worked and deductions made on their payslips as well as accumulated leave days with assistance from the participant observer.

When misunderstandings and problems were encountered, very often the participants would be able to solve them without the assistance of the employee relations personnel, or to undertake formal grievance procedures. These participants displayed problem solving, communication and leadership skills during the observation period. Participants were able to type and print attendance registers, memos and notices for their colleagues using computers.

In the event teams within an organisational unit needed to make critical decisions and take action to keep the operation running, participants took decisions competently and demonstrated good planning skills through their supervisors and team leaders by taking the lead.

4.3.2 Classroom learning activity

Learners were actively involved by way of following the facilitators' instructions. The learners participated in reading the same passage in their workbooks in the classroom and the computer lab, which led them to filling a form in choral repetition in the classroom after the facilitator. The facilitator posed questions and instructions to learners intermittently to verify their understanding

of written language and provided the meaning of new words that they were not familiar with. In response to instructions such as, "list the occasions where it was compulsory for you to fill in the forms", the learners' responses were: "At the border gate, at the bank, at the police station and at home affairs, at my sons' school". To ensure that learners did not lose focus in the lesson, they were exposed to predominantly short-answer questions using computers, assisted by the facilitators and the participant observer. Some learners asked questions to seek clarity; such as why they needed a password for filling in forms on the Internet. The facilitator's response to the learners was that the password was used to protect their personal information.

4.3.3 Facilitator/teacher activity

During classroom facilitation/teaching, the lesson started with scripture reading by a learner from Galatians 5 verse 22, followed by interpretation of the verse by other learners. In the English communication period which followed, the lesson was introduced to the learners and the facilitator read the beginning part of the passage to the learners. The passage was on how to fill in a form. The facilitator used choral repetition for learners, which is a widely used method of drilling whereby learners simply repeat words or phrases after the facilitator. This method, however, encouraged learners to actively participate in learning. A discussion was followed by showing the learners different examples of forms and illustrations in their workbooks, repeating the same lesson on the computer at one of the Own-Time centres, which used a combination of face-to-face and computer-based learning.

The learners filled in a personal details form using the computer and were asked to identify common nouns, proper nouns and adjectives, as the facilitator had explained this to them by way of answering short questions related to the form. The facilitator prepared the learners by mediating the lesson stages before writing the questions on the whiteboard. More questions were asked to establish the learners' prior knowledge. A classroom observation tool was used to systematically document the lesson proceedings, classroom interactions and environment (see Appendix E). The participant observation included aspects revealed during the lessons which the facilitator explained, for instance explaining the significance of names, surname and address when completing a form. The items selected for participant observation were linked to activity theory

(AT). The rationale for using AT concepts was to contextualise the participants' own words and experiences and to not overlook the ideas which were relevant to the lesson.

Data units and themes dealing with the same phenomenon were grouped together and classified into four identifiable interrelated categories, as shown in Table 4.3. Own voices of participants were used in the analysis to allow the user to decipher own uncontaminated accounts in the activity of learning as the unit of analysis. Roberts and Wilson (2002:4) claim that this kind of data analysis is necessary although not entirely a hermeneutic enterprise, attempting to interpret the expressed experiences, views and beliefs of people in social situations and then making that interpretation available to the research community. I went further to draw attention to the significance of the participants' utterances by the context in which they were used.

4.4 FOCUS GROUP INTERVIEWS

Focus group interviews as one of the data collection methods were conducted in two AET environments to obtain as much data as possible about learners' opinions, views and needs on what they learned when they used the computer and how it benefited them. The information from the focus group interviews revealed that learners in Own-Time integrated computers for learning English communication and numeracy. It further revealed that learners used the computer to solve numerical problems and problems related to English communication. The information from the interviews revealed that some of the facilitators at this mine did not have the required teaching or professional qualifications. However, their lack of professional qualifications did not preclude these facilitators from reducing illiteracy levels at the mine. The participants who did not have professional qualifications were mostly employed by the service provider as contractors. The information from these interviews revealed that learners were motivated to use computers for learning and enjoyed working with computers. Focus group interviews were conducted with participants at the end of fieldwork to explore the participants' experiences and feelings. The findings are discussed in more detail in the following section.

4.4.1 Coding data from learners who participated in focus group interviews

Face-to-face interviews were conducted with adult learners in two AET environments. Each focus group analysis is presented in a table showing categories, theme descriptions and participants allocated to the different responses. Underneath each table a summary of quotations obtained from the transcripts of focus group interviews supported by the literature is presented in terms of the main research question (Chapter 1, section 1.3) and interview questions (see Appendix H). Four themes were identified for learners, which are: the implementation of the AET programme, learners' motivation and benefit of attending AET studies, education and self-development and teaching and learning methods. Each theme had related categories, description and participants codes in Table 4.2 of participants' biographical data. The interview guide was aligned with the components of Engeström's activity system.

4.4.1.1 Implementation of the AET programme

One of the key dimensions revealed in the findings was the implementation of the AET programme at this mine, which was aligned with tools and object as components in Engeström's activity system. One key theme was distinguished, i.e. AET implementation strategy.

Table 4.3: AET implementation strategy

Theme number	Category	Theme description	Participants
a.	AET programme nominations	(i) *I have been nominated. I didn't ask much because I just received a message from my supervisor when I was underground. He told me my number is nominated, that I'm supposed to come to Full-Time. At that time, I was attending at Own-Time after work.*	P11
		(ii) *I decided it was my own decision to attend this. I was not nominated.*	P12
		(iii) *Before I came here I started at Own Time and then they nominated us to come here*.	P13
		(iv) *Nobody forced me to come here. I am coming myself to study and read to know something can make my life easy and to continue with my work.*	P17

a) AET programme nominations

The findings revealed that, in response to the implementation of the AET programme nominations, employees' potential advancement and talent were assessed through the process of nominations, which were conducted by their respective operations to attend Full-Time classes at particular centres. Studying at an AET Full-Time centre is equivalent to a normal working shift in a day until completion of the programme. P11 mentioned: *I have been nominated I didn't ask much because my supervisor, I just received a message from my supervisor when I was underground. He told me my number is nominated that I'm supposed to come Full-Time at that time; I was attending at Own-Time after work*. Preference was given to the learner employees who were already enrolled on the Own-Time AET stream and had already shown reasonable progress since their initial registration.

Employees who were willing to attend Own-Time AET classes did not have to be nominated. Studying at Own-Time happens during one's own time after the normal working hours shift. The learners report to the relevant Own-Time AET centres to apply for admission without any obligation. P17 contends: *Nobody forced me to come here. I am coming myself to study and read to know something can be make my life easy and to continue with my work*, whereas P12 responded: *I decided, it was my own decision to attend this. I was not nominated.* P13 commented: *before I came here I started at Own Time and then they nominated us to come here.*

The information provided in Figure 4.1 represents the steps in the data gathering process in which Mwanza's eight-step model (Mwanza 2002:55) aided in formulating the interview schedule developed according to Engeström's activity system with the focus on subject, object and community. I maintained awareness all the time of where my own innate concerns and interests interfered with those of the participants under study. The eight-step model provided the conceptual tools for describing and explaining developments in the activity system. In addition, the principle of explanation from Mwanza (2001) was borrowed to consider similarities in expanding the object of the study espoused in Engeström's model (2003) (see paragraph 3.5).

Every concept used in Figure 4.1 bears a significant meaning related to the developments under discussion, for example, subject, tools and rules, when presented in terms of AT terminology. They are to be understood in the context in which they were used. Data gathered during focus

group interviews for all participants were interpreted in terms of AT with the aid of the eight-step model to construct the activity system in Figure 4.1. The purpose of using Mwanza's (2002:131) eight-step model was to drive the participants' activity towards the achievement of the AT outcome, which was to engage with computers to transform learning, which was further highlighted in the focus group interviews.

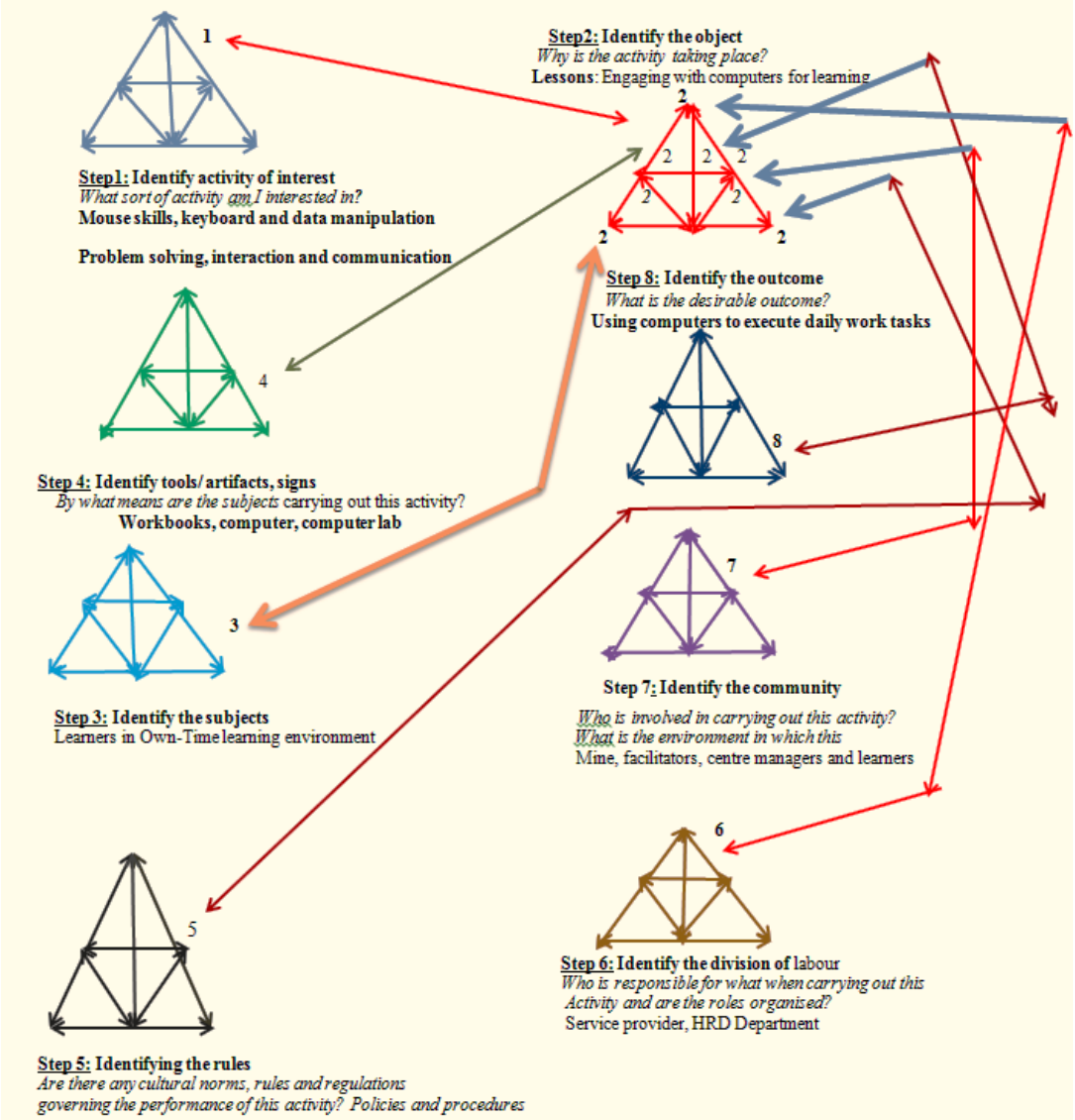

Figure 4.1: Illustration of data gathered by means of the eight-step model

I used the graphical representation of AT, with its many entwined triangles, to collaboratively identify some of the relationships within the components of AT, and to show that all components

share a common denominator, which is the object in the activity system. The arrows show the various iterations of interaction and common goal to the act of designing. A habitual pattern of interaction was identified: Without the object there would be no activity. Therefore, all these components with arrows pointing at the object complement one another. Each number is presented according to Mwanzas' eight-step model and interacts with the object of interest numbered 2. Mwanzas' questions provided understandings about the Rules/Division of Labour/Subject/Tools/Community which indicated that the seven components would be inactive or dormant in this study without the object of interest.

4.4.1.2 Learners' motivation and benefit of attending AET studies

Enrolling for the AET programme was beneficial in transforming learners from a functionally literate state to becoming literate adults. Engaging with computers for learning was revealed to be a labour of love for most of the learners. While some acquired computing skills, others were a little compromised due to the challenges they experienced with computer integration in their various centres. However, that did not preclude them from benefiting from this programme. Participants' interest in the use of computers for learning, improving qualifications for promotion purposes, reading, writing and speaking in English are noted in Table 4.4. This theme involves learners as presented in the biographical Table 4.2.

Table 4.4: Motivation and benefit of attending AET studies

Theme Number	Category	Theme description	Participants
a.	Interest in the use of computers for learning	(i) *Now right now I can open the computer myself and I can put the password and I can do the lesson on the computer until I finish the lessons and then change from the other lesson to another lesson. But, the computer gives me the access only if I pass more than 70% then I can go to the next lesson.*	P14
		(ii) *In full-time it doesn't require you to use a computer.*	P10
		(iii) *It's like now, all things for this book, communication book; I know how to work on the computer. To see the questions at the computer. Computer is nice. I like the computer. I love the computer*.	P17

Theme Number	Category	Theme description	Participants
		(iv) *Yes, on the computer I can open the computer and I can put the password and I can start with the first lesson until where I can stop and if something is different, then I can call the facilitator to come and show me something and the computer is the access for everything to me. That's why I want to learn it*.	P12
		(v) *I know how to use the computer. You type and you don't have to write everything you type. I say the computer is better because there is a big difference between the communication book and the computer.*	P11
		(vi) *We don't use the computer at Full-Time, I don't know I heard our head it says we didn't have many things to do on the computer and then they wait for the person who come to set the programmes*.	P10
		(vii) *I am not using the computer at Full-Time.*	P10
		(viii) *I used the computer in Level 2 Own-Time. Here at Full-Time we don't use computers but they are there in the lab.*	P15
b.	Improving qualifications for promotion purposes	(i) *Just because there is nothing can be easy if you can't learn or if you don't have a school certificate and then it will be difficult to work with a different people at work and then to get some promotion or to upgrade something for you it will be better for me*.	P12
		(ii) *I am becoming a complete person in that I am less and less dependent on other people for my survival. I have achieved something (e.g. AET Level 3 certificate and will be starting with Level 4, there is something coming for promotion at work) and I am living a more hopeful life since I started AET classes.*	P14
		(iii) *We write two examinations; yes, I will have two certificates this year for Level 3 and 4. In Full-Time we do Level 4 and FLC.*	P16
		(iv) *I am Level 3 for the second time because the time we write the final exam I was on leave so I haven't got the time to come to write the exam. So, right now I am doing the Maths only because I passed the English and will get certificate for AET Level 3. Urh, yes, they will promote me at work when I finished that's why I do this programme.*	P11
		(v) *I have AET 2 certificate*.	P17
		(vi) *I improve myself first, ehe, then apply for a new job*.	P13

Theme Number	Category	Theme description	Participants
		(vii) *Me, I don't know some employees who attended AET got promotion at work.*	P16
		(viii) *I left school at home long time, when I joined the mine I do AET and improve myself to get certificate*.	P15
c.	Read, write and communicate in English	(i) *I can read my payslip and I can see when they've taken more money from my salary or when there is increase, I can calculate the percentage without anybody to help me*.	P15
		(ii) *Ja, it's to communicate well with other people in English using English and to read and write proper with English. I think it's another reason to say yes, AET is really a help for me. I think so*.	P12
		(iii) *I am able to stand in front of people saying something without fear like before because I was scared when I'm standing in front of people maybe reading newspaper and then I have to demonstrate something like that so it is much better now because I can do those things*.	P13
		(iv) *Yes, it was a very difficult, or can I say it, it was complicated because the time I was reading the books I was just read without understanding but right now I can understand something if I read in the book and if somebody asks me a question then I have to take time before I can answer because sometimes I was busy with the other things which I don't know what I'm doing but right now, before I can do something I think first and then I can start continuing with the things I do. I make sure that everything I do is right*.	P16
		(v) *Right now, I am speaking English because I learn*.	P11
		(vi) *Yes, I can read a notice on the board or an advertisement, something like that.*	P13
		(vii) *Ja, it really helped because now I can communicate with other people without being nervous or scared of, you know, going to mess up. So, now I think I'm better than before. So, I think.*	P17
		(viii) *My role at work is to maintain the railways, to maintain the air pipes and water pipes. I speak in English to give instruction and not Fanagolo for the people working with me underground.*	P14

Engaging with computers was one of the objectives for carrying out this study. Table 4.4 portrays the active involvement of participants towards transforming their lives through the activity of

interest. The activity of interest in this study demonstrated understanding of the role of computers as learners engaged with computers. Every participant's active role in the activity of interest was identified as the activity system of learning in a particular learning area/subject.

The objective of the study drove the participants' interest towards achieving the outcome of the learning area taught. The objective also determined the method of learning and assisted in guiding the choice of tools which were relevant for carrying out this activity. Steps 1 and 2 of the eight-step model (see Figure 4.1) support the identification of the "activity of interest" and encouraged me to respond to the questions relating to "activity of interest" and the "objective" for the existence of the activity (Mwanza, 2002:130). Though somewhat differently stated, this objective determined the method of study and guided the tools which were expected to be relevant in the study.

Engeström and Sannino (2010:91) propose three processes that a participant considers before taking an action, which are orientation, execution and control. In Step 2 responses to the question: "Why is the activity taking place?" revealed that the activity took place for the subjects to engage with the computer by filling in forms, adjectives and nouns and plural forms as well as filling in missing words in Lesson 1. The activity of interest in Lesson 2 was in numeracy, and learners used the computer to do numerical calculations. These activities guided data gathering during the "execution stage", which is termed the actual process followed when engaging with computers, while the second stage, the "control stage", allowed the subjects to attain the intended outcomes of the calculations.

a) Interest in the use of computers for learning

In the findings, P14 responded as follows: *Now right now I can open the computer myself and I can put the password and I can do the lesson on the computer until I finish the lessons and then change from the other lesson to another lesson. But, the computer gives me the access only if I pass more than 70% then I can go to the next lesson.*

P17 further outlined the participants' interest in using computers for learning as follows: *It's like now, all things for this book, communication book; I know how to work on the computer. To see*

the questions at the computer. Computer is nice. I like the computer. I love the computer. Not all learners had the same opportunity to use computers for learning in the other two Own-Time centres and one Full-Time centre.

This was expressed thus by P15: *I used the computer in Level 2 Own Time; here at Full-Time we don't use computers, but they are there in the lab.* P10 said: *I am not using the computer at Full-Time.*

The findings revealed that in Step 5 of the eight-step model the learners (here referred to as subjects as according to AT) responded well to the question: "Are there any cultural norms, rules or regulations governing the performance of this activity?" The subjects followed instructions given to execute the computer-based task. For instance, when they were instructed to click Alt+Ctrl+Del on the keyboard to logon, enter password or shut down the computer, they complied well. Learners complied with the rules that they should not bring food, play computer games and drink in the computer lab. Responding to the question in Step 4 which sought to find out: "By what means are the participant/s carrying out this activity?", P12 stated: *Yes, on the computer I can open the computer and I can put the password and I can start with the first lesson until where I can stop and if something is different, then I can call the facilitator to come and show me something and the computer is the access for everything to me. That's why I want to learn it.*

b) Improving qualifications for promotion purposes

Responding to the theme of improving qualifications for promotion purposes, the findings revealed that there was no guarantee that once the subjects had obtained the AET qualification they would be promoted at work. The only opportunity which might be available was when there were vacancies, and the normal recruitment process would follow. It appeared as if supervisors used promotions as a motivation to encourage the participants to enrol for these studies. This may be the reason the policy was silent about promotions.

The hint about promotions was also indicated by P13, who explained: *I improve myself first, ehe, then apply for a new job.* However, there were mixed feelings from the participants about improving qualifications for promotion purposes. But P11 had a different opinion and responded

by saying: *I am Level 3 for the second time because the time we write the final exam I was on leave so I haven't got the time to come to write the exam. So, right now I am doing the Maths only because I passed the English and will get certificate for AET Level 3. Urh, yes, they will promote me at work when I finished, that's why I do this programme.*

P14 affirmed: *I am becoming a complete person in that I am less and less dependent on other people for my survival. I have achieved something (e.g. AET Level 3 certificate and will be starting with Level 4, there is something coming for promotion at work) and I am living a more hopeful life since I started AET classes.* Furthermore, P16 responded by saying: *Me, I don't know, some employees who attended AET got promotion at work.* Some learners were more interested in acquiring a certificate, as disclosed by P15: *I left school at home long time, when I joined the mine I do AET and improve myself to get certificate.*

c) Read, write and communicate in English

The objective to read, write and communicate in English is denoted in Figure 4.2, Step 8, which responds to the question: "What is the desirable outcome?" The findings revealed that subjects were able to use the computer for learning and to complete tasks in the face-to-face classroom. They could read, write and speak in English, and could read notices, time-sheets, memos, and examine and interpret reports. P15 confirms this: *I can read my payslip and I can see when they've taken more money from my salary or when there is increase, I can calculate the percentage without anybody to help me.* P12 echoes the same view: *Ja, it's to communicate well with other people in English using English and to read and write proper with English. I think it's another reason to say yes, AET is really a help for me. I think so.*

The outcomes of participants in this programme who formed the focus group were achieved by means of intermediate actions which continuously helped them to engage with the object in the activity system. Media Works' project manager and coordinator loaded classroom activities on computers prior to the commencement of the lessons for ease of access by the learners. P13 responded in this regard: *Yes, I can read a notice on the board or an advertisement, something like that.* The participants' intended outcomes are reflected by P14, who stated that the programme had helped them in their work: *My role at work is to maintain the railways, to maintain the air*

pipes and water pipes. I speak in English to give instruction and not Fanakalo for the people working with me underground.

4.4.1.3 Education and self-development

The AET programme at this mine was designed to change the lives of their workforce by focusing on education and self-development (see Table 4.5) to provide the individuals with basic knowledge tools and necessary skills at home and at work. I was enthusiastic to conduct this study at the mine to be able to comprehend and discover participant's motives, views and experiences of the AET programme. This enthusiasm was stimulated in the realisation that learning has an enormous potential to promote the construction of knowledge (Zhu, 2012:127). This theme covers learners as presented in the biographical data in Table 4.2.

Table 4.5: Education and self-development of learners

Theme number	Category	Theme description	Participants
a.	Standard of work and knowledge	(i) *Ja, I can say that I have been doing better and I don't know how to put it but the most thing is I can read with understanding, you know, that thing that has been on the notice board at work and to me it is easy, you know, because when you are on duty sometimes you are working with measures so it's easy for me to know that when they are talking about 2 m or 3 m how to calculate that without using a what do they call it….measure tape. So, because I know how to calculate these things, ja, AET is really helping me and I do apply what I get from school at work.*	P13
		(ii) *Really my performance is it has really changed. It's changed because the management and my supervisors, they like the way I perform at work and the way I control the people at work.* *Always at work we talk about safety, so safety is anywhere from here at work and at home and anywhere, so they like the way I work now. My performance is good.*	P14
		(iii) *I measure the square. I know if my square is 34m, I need eish 8.5 m times 8.5 m to blast underground. If somebody he says is 1.5m but it is 8.5m it means he doesn't know how to count.*	P17
		(iv) *Yes, my performance has changed a lot. At work I don't ask somebody to explain something to me. I read and I write*	P10

Theme number	Category	Theme description	Participants
		everything for myself and even if there is a query I can solve it. Even my team, if they have some problems, I try to solve it before I take the further steps to the top management or to the head of department. Then, after I solve it then I take or I make the written letter to the head of department to show him I have solved something.	
		(v) *At home, also, I can help my children. If I am late from work and I arrive home I am studying my books, he enjoys to come with his books and sit close to me and we discuss something. He likes to speak to me more than his mother because his mother, she is so tempered, she says no. I mean now I have the books but right now I am older at home but I enjoy the books.*	P15
		(vi) *Ja, I communicate well with other people in English. I can follow and give orders using English, and to read and write proper with English I think it's another reason to say yes, AET is really a help for my performance*.	P11
		(vii) *I think I have improved a lot at work. I can see the mile from Level 2 until Level 3. I am starting Level 4 next month. I feel good about my work. I am no longer scared or hide behind colleagues because I did not have much knowledge of my job.*	P16
		(viii) *I write my name on the board and sentences. At the banks I can interpret the bank statement, my payslip, read them and I can express myself, I don't need assistance I can read from the board questions and computer and fill the forms. When I have free time I read newspaper and understand what it says. At work I read my shift on time sheet.*	P12
b.	Confidence and assertiveness	(i) *Yes, I can say it has improved my life because now I can do the things that I was not doing like going to the bank, going to withdraw money or deposit or want to speak with somebody else or if I wanted help at the bank I can go and ask for myself without sending another person to translate for me*.	P11
		(ii) *Yes, it has improved because I was a leader at work but somewhere I got problems some big challenge but now I have the confidence and I am a profitable leader for my team.*	P15
		(iii) *The time I walk everywhere in town. I don't ask for the directions anymore, the boards tell me the directions. I read the board and I know how many kilometres to get to my place. I am started to use computer here at Own-Time and I can't use it every day. I work overtime and the cage comes late from underground when the class is finished and I am tired.*	P10

a) Standard of work and knowledge

The participants felt that the AET programme afforded them opportunities to improve their performance at work and generally in society through self-development and education. They had developed positive mental attitudes, and their work-related skills had improved. This was a strong conviction expressed by the participants, as substantiated by the following statements:

P16: *My job is a PTV. It's called pipes, tracks and salvage. After attending this course I can read safety rules for my crew and explain what they mean and what must they follow.*

P17: *I measure the square. I know if my square is 34 m, I need eish 8.5 m times 8.5 m to blast underground. If somebody he says is 1.5 m but it is 8.5 m it means he doesn't know how to count.*

For P10, improved performance even meant taking on a leadership role: *Yes, my performance has changed a lot. At work I don't ask somebody to explain something to me. I read and I write everything for myself and even if there is a query I can solve it. Even my team, if they have some problems, I try to solve it before I take the further steps to the top management or to the head of department. Then, after I solve it then I take or I make the written letter to the head of department to show him I have solved something.*

P12 believed that the programme had really improved his performance: *I write my name on the board and sentences. At the banks I can interpret the bank statement, my payslip, read them and I can express myself, I don't need assistance I can read from the board questions and computer and fill the forms. When I have free time, I read newspaper and understand what it says. At work I read my shift on time sheet*.

For these participants, performance had been enhanced beyond the work environment. P15 stated in this regard: *At home, also, I can help my children. If I am late from work and I arrive home I am studying my books, he enjoys to come with his books and sit close to me and we discuss something. He likes to speak to me more than his mother because his mother, she is so tempered, she says no. I mean now I have the books but right now I am older at home but I enjoy the books*.

Thus, the participants saw the transformation that the programme had brought in their practice as employees at the mine. P11 was now better equipped in expressing himself: *Ja, I communicate well with other people in English. I can follow and give orders using English, and to read and write proper with English I think it's another reason to say yes, AET is really a help for my performance.* P16 also explained the transformation that the programme had brought in his life when he stated: *I think I have improved a lot at work. I can see the mile from Level 2 until Level 3. I am starting Level 4 next month. I feel good about my work. I am no longer scared or hide behind colleagues because I did not have much knowledge of my job.*

b) Confidence and assertiveness

Participants' expression of their confidence that emanated from attending this programme was useful to the study. Participants claimed that after attending this programme they were able to do the things they could not have done on their own, such as communicating in English and taking a stance to address issues. Their experiences reflected the programme's efficacy, which has made a positive impact in their lives.

P10: *The time I walk everywhere in town. I don't ask for the directions anymore, the boards tell me the directions. I read the board and I know how many kilometres to get to my place. I am started to use computer here at Own-Time and I can't use it every day. I work overtime and the cage comes late from underground when the class is finished and I am tired.*

P11: *Yes, I can say it has improved my life because now I can do the things that I was not doing like going to the bank, going to withdraw money or deposit or want to speak with somebody else or if I wanted help at the bank I can go and ask for myself without sending another person to translate for me.*

P15 *Yes, it has improved because I was a leader at work but somewhere I got problems some big challenge but now I have the confidence and I am a profitable leader for my team.*

4.4.1.4 Teaching-learning methods

Facilitators/teachers facilitated learning by taking into cognisance the diverse needs of learners. The facilitators created a climate appropriate and conducive for effective learning to take place daily. Effective communication represented an understanding of the need to consider learners' differences. In addition, the facilitators demonstrated their knowledge of the subject matter by using suitable and significant resources in an industrial context. The facilitators understood the learning materials to be able to teach the learners, and designed tasks that were challenging and appropriate to the learners' level of understanding. The questions that were asked in Step 6 under division of labour were: "Who is responsible for what when carrying out this activity and how are the roles organised?" The response from the findings revealed that the facilitators and learners were all responsible for teaching and learning. The facilitators had sequentially paced learning in a sensitive manner to accommodate the learners' needs.

This study contends that the answer lies in the "custom-designed development of e-learning tools that are specific to the task required and that support learners' own reflective learning (Newbery-Jones, 2015:20). The findings confirm the usefulness of Delone and McLean's model (2004:31) in gauging the success of the information system's implementation of the AET computer-based programme at the mine. DeLone and McLean (2003:9) note that service quality is comprised of reliability, responsiveness, assurance and empathy, while information quality is comprised of accuracy, timeliness, completeness, relevance and consistency. Six first-order constructs were used to measure the systems' success.

Systems success is comprised of seven first-order latent constructs which fall into two broad categories, namely system level and business level. The system level includes system quality, information quality, service quality and use, while the business level includes institutional trust, business value and future readiness. Figure 4.2 depicts how Delone and McLean's model is used in the field, assessing the validity and to test the appropriateness of the multimedia programme used by the subjects.

The findings reveal that the multimedia programme was beneficial to the learners and the organisation, as attested to by P11: *I know how to use the computer. You type and you don't have*

to write everything you type. I say the computer is better because there is a big difference between the communication book and the computer. The findings confirm that the DeLone and McLean information systems success model (2004:31) can be adapted to the AET context, as systems in the AET multimedia programme were capable of facilitating and exchanging information. The computer simulations were designed in English, and the meaning and pronunciation of some English words were difficult for second-language speakers. However, with the assistance of facilitators some learners were able to complete the computer-based tasks on time.

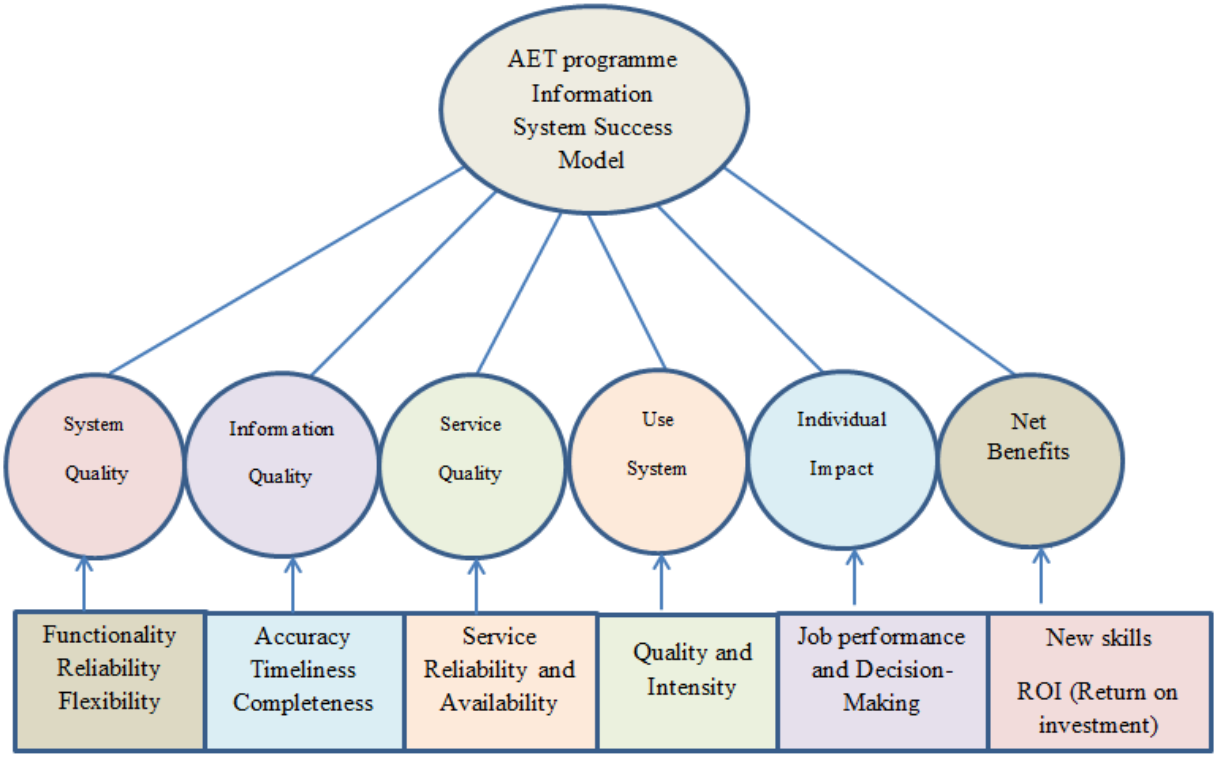

Figure 4.2: AET Information System Success Model

Table 4.6 presents a description of each of the labels adopted from DeLone and McLean (2004:31) depicted in Figure 4.2.

Table 4.6: Description of labels

Construct name	Description of construct characteristics and their impact on individuals
Systems quality: Was palpable in the multimedia programme which embodied the technical success of the system.	System quality was measured in terms of ease of use, functionality, reliability, flexibility, data quality, portability, integration and importance.
Information quality: The system information was of high quality.	Information quality was measured in terms of accuracy, timeliness, completeness, relevance and consistency.
Service quality: Good quality and well supported products.	This was measured according to service reliability, service availability and tangibility of hardware and software. Employees had the knowledge to do their job well.
Use: Was measured as frequency of use, time of use, number of accesses, usage pattern and dependency.	Quality and intensity of the system use: The use of the system was relative to the number of tasks and coordination of work across functions; however, participants were allowed to use the system even without monitoring facilitators.
Individual impact: Was measured as improved performance.	Impact on individual employees was measured in terms of job performance and decision-making performance.
Net benefit: Was measured as positive organisational impact and ROI.	Net benefits success measures were most important and were analysed with system quality and information quality measurements. Knowledge and new skills were acquired which could be used at home and provided return on investment (ROI).

4.5 FINDINGS FROM STRUCTURED INTERVIEWS WITH CENTRE MANAGERS AND FACILITATORS

As suggested by Roberts and Wilson (2002:4), it was essential to retain the participants' utterances to reveal the meaning they conveyed at the time of the interviews. Rowley (2012: 262) explains that interviews are useful when the research objectives centre on understanding experiences, opinions, attitudes, values, and processes.

4.5.1 Coding data from facilitators and centre managers who participated in the structured interviews

Face-to-face interviews were conducted with facilitators and centre managers in two AET environments. Each interview analysis is presented in a table showing categories, theme descriptions and participant codes allocated to the different responses. Underneath each table a summary of quotations obtained from the transcripts of structured interviews supported by the literature is presented in terms of the main research question (Chapter 1, section 1.3), and interview questions (see Appendix F & G). Three themes were identified for facilitators and centre managers, which are: AET policy and procedures, using assessment for lesson planning, and the roles of service provider and project management. Each theme had related categories, description and participant codes, as seen in Table 4.1 of facilitators' and centre managers' biographical data. The interview guide was aligned with the components of Engeström's activity system. Table 4.7 shows a summary of the theme AET policy and procedures.

4.5.1.1 AET policy and procedures

The policy was used as a benchmark for the selection process of candidates in two AET learning environments. It is the interpretation of this study that the policy appeared to be focused more on the Full-Time learners because they would be absent from work for the entire year attending studies with full benefits, whereas Own-Time learners attended during their own free time as attendance was not obligatory. Table 4.7 presents the facilitators' and centre managers' responses regarding the AET policy processes and procedures. The themes manifested themselves as patterns which emerged within each set of observed data. The four identified themes were person(s) responsible for the selection process and procedure, policy implementation, reviewing the policy, and challenges faced with implementation. The theme AET policy and procedures covers the AET facilitators and centre managers as presented in the biographical Table 4.1.

Table 4.7: AET policy and procedures

Theme number	Categories	Theme description	Participants
a.	Selection process and procedure	*The policy is followed by all involved in selecting adult learners to attend AET studies.*	P6

Theme number	Categories	Theme description	Participants
b.	Policy implementation	*The mine has adopted the policy and procedures, and has the implementation strategy in place*.	P2
c.	Reviewing policy	*The business operation human resource development (HRD) managers, through their staff, assume responsibility for annual planning and setting of AET targets and staff requirements to meet the said targets; that when policy is reviewed learners and facilitators are engaged minimally, whereas they are the parties involved in the teaching-learning process.*	P7
d.	Challenges in the implementation of policy	*The policy does not specify the delivery mode of teaching and learning; however, the AET programme consists of multimedia and face-to-face teaching and learning but lessons are mostly delivered via face-to face*.	P8

a) Selection process and procedure

The findings based on participant observation under the AT component rules revealed P6 claiming that there is an AET policy in the mine which covers both the AET learning environments and drives the norms and standards in the teaching-learning milieu. Subsequent to that, the findings revealed the process and procedure for selection of learners for the courses. For instance, P6 outlined that *the policy is followed by all involved in selecting adult learners to attend AET studies*. The findings further revealed that a Full-Time learner studied for the hours equivalent to his or her normal working shift in a day until the completion of the AET programme. Learners studying at Own-Time did so out of their own interest in developing themselves and they did so after their normal working hours.

b) Policy implementation

P2 reported as follows (as stated before, participants' verbatim responses are presented in italics): *The mine has adopted the policy and procedures, and has the implementation strategy in place.* Some participants mentioned that though there were implementation strategies, they were not followed precisely at the business operations for selection of learners, especially Full-Time learners. They pointed out that some managers were not willing to release the learners to attend

Full-Time studies because they had to hire contractors and train them for the jobs, which took a great deal of time and affected production.

c) Reviewing policy

P7 stated: *The business operation human resource development (HRD) managers, through their staff, assume responsibility for annual planning and setting of AET targets and staff requirements to meet the said targets; that when policy is reviewed learners and facilitators are engaged minimally, whereas they are the parties involved in the teaching-learning process*. Other participants highlighted that reviewing the policy at the mine did not guarantee that processes and procedures would be followed, though employees were entitled to request full-time education. However, these requests were authorised by line management, and there was still favouritism in selecting candidates for studies.

d) Challenges in the implementation of policy

The programme did not take place without revealing challenges in the policy for some Own-Time and Full-Time learning environments. In this regard, P8 explained as follows: *The policy does not specify the delivery mode of teaching and learning; however, the AET programme consists of multimedia and face-to-face teaching and learning but lessons are mostly delivered via face-to face.* At the top of the list was the lack of computer integration or multimedia for teaching and learning, which deprives facilitators of the opportunity to teach via a computer and learners to acquire computing skills. Some learners and facilitators confirmed that every learning centre had a computer lab equipped with computers that were not used to enhance teaching and learning. The challenges included failure to install hardware and software, technical problems, and the information systems policy, which did not allow software to be installed without following the mine's Information Communication policy.

Tondeur, Van Braak and Valke (2007:962) contend that an information and communication technologies (ICT) policy plan seems to be an important incentive to foster the integration of ICT use in the classroom, but only when facilitators are aware of its content. The implementation of AET programmes at this mine is at an advanced stage, dating back to the year 2008. It was

mentioned during the interviews that some of the former learners were embarking on a programme as learner miners, while others were registered for mining and engineering learnerships.

4.5.1.2 Using assessment for lesson planning

One of the key dimensions revealed in the findings was the use of assessments for placement of learners in the AET classes.

a) Assessments

Assessments were used to determine the learners' strength and needs, to enable facilitators and centre managers to identify the areas of reading and writing which determined where the learner could be placed in the AET programme. The theme assessment in the AET programme manifested itself as a pattern that emerged within each set of observed data. This theme is presented in Table 4.8. It covers facilitators and centre managers as presented in the biographical Table 4.1.

Table 4.8: Assessments

Theme number	Category	Theme description	Participants
a.	Assessments	(i) *After learners were identified, the learners' learning potential was formally assessed, using the following two methods; firstly, the Learning Potential Computerised Adaptive Test (LPCAT) was conducted and secondly, interviews were conducted by a mini panel consisting of operations HRD and direct supervisors.*	P7
		(ii) *Assessment helps for placing learners in the right class for their level. Some have grade 12. When we assess that qualification we don't know how they have passed it; they belong to a lower level especially for Maths.*	P2
b.	Lesson Planning	(i) *Most of the teachers/facilitators made concerted efforts to plan their lessons step-by-step in conjunction with learners' workbooks prepared by Media Works.*	P3
		(ii) *Delivery of content happened within given time frames and communication in the classroom was encouraged.*	P1
		(iii) *I think the use of computer is much, much better than doing face to face but depending on the group of learners that you have. Uh, so somehow face to face is also good but the computers are also good if they can use them after*	P5

Theme number	Category	Theme description	Participants
		they face to face or before they do face to face, it is a, we are using it as a supplementary.	

P7 explained: *After learners were identified, the learners' learning potential was formally assessed using the following two methods: firstly, the LPCAT was conducted and secondly, interviews were conducted by a mini panel consisting of operations HRD and direct supervisors*. The purpose of assessment was to identify the learner's current skills in relation to literacy in English or mathematical literacy skills, to ensure that s/he was placed for entry into the correct AET Level for either Communication /or Mathematical Literacy.

P2 responded: *Assessment helps for placing learners in the right class for their level. Some have grade 12 when we assess that qualification we don't know how they have passed it, they belong to a lower level especially for Maths.* Learners who were regarded as suitable to enrol for AET studies followed the above process.

b) Lesson planning

A lesson plan is a detailed systematic guide that summarises the facilitators' goals for what the learners will achieve during the development of the lesson and how they will learn it. The theme lesson planning in the AET programme manifested itself as a pattern which emerged within each set of observed data. This theme is presented in Table 4.9 and covers facilitators and centre managers as presented in the biographical Table 4.1.

Table 4.9: Lesson planning

Theme number	Category	Theme description	Participants
a.	Lesson Planning	(i) *Most of the teachers/facilitators made concerted efforts to plan their lessons step-by-step in conjunction with learners' workbooks prepared by Media Works.*	P3
		(ii) *Delivery of content happened within given time frames and communication in the classroom was encouraged.*	P1

Theme number	Category	Theme description	Participants
		(iii) *I think the use of computer is much, much better than doing face to face but depending on the group of learners that you have. Uh, so somehow face to face is also good but the computers are also good if they can use them after they face to face or before they do face to face, it is a, we are using it as a supplementary.*	P5

P3 stated: *Most of the teachers/facilitators made concerted efforts to plan their lessons step-by-step in conjunction with learners' workbooks prepared by Media Works.* The findings reveal that the goal-orientated facilitators followed the instructions to fulfil their daily lesson requirements as prescribed. Facilitators conscientiously showed content when they had achieved or completed the activities of the day. Most participants (facilitators) remarked that the activities of the day had to be completed to avoid losing the skills development grant benefit.

P1 confirmed that *delivery of content happened within given time frames and communication in the classroom was encouraged.* Apart from focusing on completing the prescribed work to cover the four to six months' scope of the curriculum for Own-Time and Full-Time, facilitators also focused on active learner engagement and participation. Even weaker adult learners could cope in the available time in which the day's prescribed goals were to be achieved.

Learners were afforded many talking opportunities, mostly in the face-to-face classroom, which comprised mainly open-ended questions. Learners were encouraged to express themselves freely. Facilitators' presence was dominant in the face-to-face environment because most of the centres only used face-to-face and not multimedia or computer-based learning. Mohr and Mohr (2007:440) mention that research has indicated that teacher talk dominates classroom communication. However, communication skills develop when learners are interested and more engaged rather than simply being there, responding to the teachers' instructions (Van Wyk & Higgs, 2011:171).

Learners showed interest in engaging with the computer as the object in the activity system. At present, there is only one Own-Time centre that is integrating computers for learning and thus

enhancing learners' computer-based skills. The other two Own-Time learning centres and one Full-Time centre were not using computers for learning because of technical problems encountered at the computer centres. P5 responded: *I think the use of computer is much, much better than doing face to face but depending on the group of learners that you have. Uh, so somehow face to face is also good but the computers are also good if they can use them after they face to face or before they do face to face, it is a, we are using it as a supplementary.*

It is the understanding of this study that the mine has a service-level agreement with the service provider Media Works, who provides the mine with AET curriculum for face-to-face and multimedia teaching. The service provider installs the learning intervention management system (LIMS) Navigate in every learner workstation connected to the local area network (LAN). Through interaction with the learners in the computer lab, the findings revealed that Navigate involves project-based training, with each project having a defined timeline which manages and monitors the entire learning intervention and supports the service provider's AET programmes, as shown in Table 4.9.

4.5.1.3 Role of service provider and project management

All AET trainings at the mine in the North-West Province happen in the form of a project. The training programme has a start and end date and the learners need to be assessed at the end. The start date and end date are critical, and all management reports use these to calculate the progress of a project. Each project has one or more classes. A class is a group of learners that have something in common. Each computer-based class is made up of one or more students/courses, and roles and responsibilities are assigned to all users by the facilitator, who has administrative rights, as represented in Table 4.10. The service provider's project manager has access to all functionality available in Navigate at the mine and is responsible for reporting system maintenance, user level setting and general monthly reporting to the service provider and the mine. The project manager determines what functionality is made available to the facilitator. Table 4.10 outlines reporting, monitoring and quality assurance. This theme covers facilitators and centre managers as presented in the biographical data Table 4.1.

Table 4.10: Reporting, monitoring and quality assurance

Theme number	Categories	Description	Participants
a.	Reporting and Monitoring	*The company receives a monthly report from the Media Works project coordinator which outlines the attendance and progress of each learner's and facilitator's performance.*	P9
b.	Examinations Board	*There are two examination boards: Independent Examination Board (IEB) and Benchmark Assessment Agency, which is affiliated to Media Works, and learners are allowed to write any of the examinations*.	P8
c.	Quality Assurance	*The company is responsible for registering as an Examination Centre and for registering learners for examinations, not the service provider.*	P6
d.	Notional hours	*There are special arrangements made by the mine for learners to write the subjects the learners did not achieve. In order to complete, say, my subject, numeracy, they need in total 210 hours in six months.*	P4

a) Reporting and monitoring

In response to the AET policy under the role of service provider and project management, P9 explained: *The company receives a monthly report from the Media Works project coordinator which outlines the attendance and progress of each learner's and facilitator's performance.*

b) Examination Board

About examinations, P8 stated: *There are two examination boards: Independent Examination Board (IEB) and Benchmark Assessment Agency, which is affiliated to service provider, and learners are allowed to write any of the examinations.*

c) Quality assurance

P3 stated: *The external assessment bodies assess learners at Levels 1 to 4 in two semesters.* National exams are held in June and November. Mock examinations are a prerequisite for summative examinations. All learners are expected to write and pass mock examinations with a minimum of 50% per learning area. Learners who do not achieve the required minimum as stated

above are not allowed to sit for summative examinations. P6 stated: *The company is responsible for registering as an Examination Centre and for registering learners for examinations, not the service provider.*

Table 4.11 and Table 4.12 represent the AET project plan notional hours. These hours serve as a guideline only. The number of hours a learner takes to complete a level depends on the learner's ability and potential. Not all learners are guaranteed to move to the next level within these time frames. Therefore, the mine allows the learners the opportunity to repeat a subject and carry over to the next level with the outstanding subject. P4 stated the following: *There are special arrangements made by the mine for learners to write the subjects the learners did not achieve. In order to complete, say, my subject, numeracy, they need in total 210 hours in six months.*

Table 4.11: Multimedia or computer-based learning

Level	English	Numeracy
Leve1 1	180 hours	180 hours
Level 2	160 hours	180 hours
Level 3	160 hours	210 hours
Level 4	240 hours	240 hours

Table 4.12: Face-to-face learning

Level	English	Numeracy
Leve1 1	200 hours	180 hours
Level 2	200 hours	180 hours
Level 3	220 hours	220 hours
Level 4	240 hours	240 hours

The policy is much sterner for learners studying full-time because it is equivalent to a normal working shift in a day and learners still receive their cost to the company while studying. Learner progress is carefully monitored and documented because in some instances, but not all, temporary contract workers were employed as replacements to do the job in the absence of Full-Time learners. At Own-Time, the policy is more lenient as attending these studies is voluntary. One of the prerequisites for full-time studies is that a learner must have completed Own-Time studies to

enrol for Full-Time. Furthermore, placement assessments are conducted for all learners involved when enrolling for this programme.

In interpreting the findings in the facilitators' and centre managers' structured interviews, AT was used to make sense of the training interventions of AET at the mine as it prepared for the AET computer-based training program. Mwanza's (2001) eight-step questions were applied as follows:

1. *Activity of interest* – what sort of activity am I interested in?
This question was answered by naming the AET computer-based learning program used for Numeracy and English communication on the LIMS supplied by the service provider during interaction with centre managers. The activity of interest was at Own-Time at the mines which engaged computers for learning.

2. *Object or objective of activity* – why is this activity taking place?
The objective was to redress the level of illiteracy for the mine workers by integrating computers for teaching and learning. Prior to concluding this study, I realised that the question which would have been relevant in describing the object which was acted on by the subject could have been: Which changes were identifiable from the subjects as a result of this activity? The object of the activity was engaging with computers for learning. At the same time, learners were being taught computer-based skills such as mouse handling and keyboard use as forms of input devices. This modification of Mwanza's question could improve the meticulousness and transparency of what the mine hoped to achieve by implementing the training programme in the first place, and differentiates this question more clearly from the question of outcome.

3. *Subjects in this activity* – who is involved in carrying out this activity?
The subjects included seventeen participants who volunteered to participate in the study.

4. *Tools mediating the activity* – by what means are the subjects carrying out this activity?
There was a wide-ranging list here in answering the question, which included textbooks, workbooks, white boards, computers and the computer lab.

5. *Rules and regulations mediating the activity* – are there any cultural norms, rules or regulations governing the performance of this activity?
Here there was a wide-ranging list pertinent to the use of computers in the lab in answering the question, which included policy and procedures for AET, policy for the mines' information communication technology (ICT), classroom policy.

6. *Division of labour mediating the activity* – who is responsible for what, when carrying out this activity and how are the roles being organised?
In response to this question, all individuals involved were listed, e.g. service provider, HRD department and business operations who would be sending workers to attend the programme.

7. *Community in which activity is conducted* – what is the environment in which this activity is carried out?
The community consisted of the mine, facilitators, centre managers and learners.

8. *What is the desired outcome from carrying out this activity*?
Desired outcomes included enhanced performance at work from mine workers, the use of computers to execute daily tasks, communication via computers using e-mails, preparing presentation slides, typing memos and time sheets, and ability to communicate in English, thus being able to read safety signs underground to curb accidents.

The answers listed above represent an incorporation of this group of participants' responses and their collective understanding at the time of this study. The responses were arrived at jointly during interviews.

4.6 CONTRADICTIONS AND DISTURBANCES IN THE ACTIVITY SYSTEM

The inner contradictions experienced by subjects in the activity system of learning by means of a computer were identified. The process began by identifying clues that exposed contradictions such as tensions, conflict, network failure and lack of computer integration in learning for some Own-

Time and Full-Time learners. The four levels of contradictions in Figure 2.6 pervaded all the elements of the activity system.

The findings revealed that the primary contradiction was the use of the object (computers) in the activity system in the four AET centres. Only one Own-Time centre used the combination of face-to-face and multimedia and the other two Own-Time centres and a Full-Time centre did not integrate computers for learning. P10 states: *In Full-Time it doesn't require you to use a computer.* The lack of computer integration for teaching and learning slowed down the outcome in the activity system.

The primary contradiction evolved taking the form of secondary and tertiary contradictions which contributed to the instability of the system. AET centre managers and facilitators did not seem very keen to be accountable and responsible for integrating computers for teaching and learning. However, they seemed to have shifted their responsibility by blaming the rules for their lack of multimedia use, technical problems and migration of systems from an old company to the new company, and the company's information system policy for the eight months of this study, which in my opinion showed a lack of commitment and shifting the blame.

The findings further revealed that the new methods for facilitation, which included the integration of computers, did not necessarily fit into the facilitators' daily classroom practices as they seemed to be comfortable with face-to-face teaching, and only used computers to fast-track those adult learners who were seasoned performers. The AET centre managers and facilitators did not appear to be accountable nor to take the responsibility for introducing the integration of computers for teaching and learning to meet other daily teaching responsibilities. Furthermore, the multimedia programme for which the company spent a considerable amount to install on its computers for teaching and learning at AET did not seem to be utilised to its full capacity.

The findings exposed that the quaternary contradictions manifested themselves in the object and division of labour. They revealed that the computer-based venue monitoring tool used to report technical problems directly to Media Works was not well utilised by facilitators, as shown in Figure 4.3. The tool allows for the technician to guide the facilitator who has reported the issue step by step to resolve the problem.

Figure 4.3: Venue monitoring tool

Added to the quaternary contradictions was the tension which existed between rules and the community. One of the rules suggests that the mine should encourage centre managers to log a call with the mine's service desk so that a computer technician can perform technical assistance for the computer programme to run fully. However, the Media Works technician took days or weeks after a call had been logged by the AET centre manager to come on site and resolve the problem. It follows that the slackness on the side of the technicians affected the rest of the community. The contradictions deliberated upon thus far are further highlighted in terms of the time of computer usage for teaching and learning, and computer usage versus face-to-face teaching and learning.

4.6.1 Contradictions in time of use of computers for teaching and learning

Several factors raised by the participants revealed tensions that made the introduction of computers an arduous and demanding process. The facilitators experienced the rush against time to introduce computers as they had more learners than the number of computers in the computer lab. Every computer lab had ten learner workstations and one facilitator workstation. Therefore, not all the classes running Full-Time and Own-Time simultaneously could make use of the single lab per centre, which could be the reason they appeared comfortable with face-to-face teaching.

The facilitators were faced with the marking of workbooks and giving learners individual attention, and many other tasks, for which the amount of time allocated in their teaching notional hours as reflected in Tables 4.11 and 4.12 caused tension among the colleagues, as they had to alternate in using the computer lab. The computer lab did not meet the requirements of every learner to introduce him/her to the new ways of learning. Instead of incorporating the combination of the two methodologies provided in the Media Works curricula, facilitators and some centre managers focused on face-to-face teaching, which deviated from the AET curriculum. The tension was primarily caused by a lack of resources to accommodate all learners enrolled in this programme. This tension discouraged the stable and operational way of acting on the object of the activity system and consequently enhancing new ways of learning. These two tensions obstructed the subject from engaging with the object of the activity at hand. Also, they affected the community and the division of labour.

4.6.2 Contradiction between the use of computers and face-to-face

Subjects in this particular Own-Time class did not find it hard to use the computer as it might be otherwise perceived, but they did not have enough time to do so because of their knocking-off time and shift work. There was tension between their type of work as shift workers and their attendance of the training programmes as in most cases they missed classes because they worked over-time. When they were tired, they did not bother to come to class because they knocked off late. The fact that Own-Time is perceived as attendance at own time and thus not compulsory might have motivated the decision not to attend class.

P10 attested to this: *The time I walk everywhere in town. I don't ask for the directions anymore, the boards tell me the directions. I read the board and I know how many kilometres to get to my place. I am started to use computer here at Own-Time and I can't use it every day. I work overtime and the cage comes late from underground when the class is finished and I am tired.*

P2 stated: *The others are knocking off late. They work underground, Uhm, you see like, right now it's, it's around 4. They are not here they are still underground even now, the class starts from 3 to 5 but even those that came after 3, we just accommodate them and the classes will just decide maybe we can extend the time until 6 o'clock.*

The findings revealed that it was difficult for Own-Time learners to balance their work life with their studies. They needed to keep a job to pay their bills, while at the same time not neglecting their families in the neighbouring countries. Without knowing why they needed to attend AET studies at Own-Time, which was not obligatory, it was the interpretation of this study that they struggled to find value in the process of learning. Full-Time adult learners, on the other hand, knew the need, which was to meet their performance at work; hence, they went back to the AET centres to learn and were supported by AET policy and procedure. I concur with Knowles (1990:75) that adult learners need to know why something is important for them to learn, and that they are responsible for their own decisions.

4.6.3 Contradiction between older subjects and object

Contradictions are inevitable in the functioning of any activity system because they serve as useful sources for expansive developmental transformations (Igira & Aanestad, 2009:209). The contradiction was between the subject and the object. Subjects are referred to in this study as participants. These participants revealed that older adult learners between the age of forty-five and sixty took a longer time to navigate around the computer, and had more difficulty recalling actions using the computer.

The findings revealed that older learners felt unsure about technical abilities required by the object of the activity system and still needed the help of the facilitator. Age had some effect on cognitive ability and computer performance (Atherton, 2005:234). There was a need for better design of web pages in this computer-based programme (DePallo, 2000:89). AT is therefore about how subjects transform objects, and how the various components of the system mediate transformation. The literature on andragogy identifies gaps in knowledge and appraised models in lifelong learning and their application to adult learning (Guo & Jamal, 2011:18-30).

There are six assumptions in andragogy, only two of which are discussed in the findings appropriate to this study (Knowles & Associates, 1984:309). Firstly, as stated before, Knowles contends that adults need to know why they need to learn something. Secondly, Knowles posits that adults have a great deal of experience to bring to an educational setting. The findings revealed that these adult learners entered the educational environment with challenges to use the computer

independently. Among these challenges were those which directly affected older learners. These elderly learners showed anxiety, poor navigation, and reduction in cognitive abilities, which played a role in learning and pedagogical learning methods. They needed facilitator direction, computing skills and knowledge. The mine has a large number of learners who come from neighbouring countries. Such learners were revealed in the findings as requiring more time and effort from facilitators to teach because of their inability to express themselves in English as a medium of instruction. An adult education facilitator needed to ensure that a solution to one cultural group did not discriminate against others.

As the older adult learners gained confidence, more andragogical approaches were needed from the facilitator. These characteristics reveal that adult learners can learn in a diverse learning centre despite the challenges that they experience (Rachal, 2002:229). Barab et al. (2002:79) provide an example, that although a computer may serve as a tool in a current action, at an earlier time this computer may have been an object or an outcome in what may be conceived as a previous action of the same activity system altogether. Objects of previous actions may change rules and division of labour.

Younger adult learners claimed to find computers interesting and exciting to use and there was a smooth computer-learner interaction, because they owned smart-phones and were familiar with the keyboard and some icons on the monitor. They argued that they were able to send text and multimedia messages and were on social media. P17 confirms this: *It's like now, all things for this book, communication book; I know how to work on the computer. To see the questions at the computer. Computer is nice. I like the computer. I love the computer*. This study argues that the younger adults' self-concept tends to be more pliable and still going through the process of self-discovery and identity formation. P3 confirms this: *When they are in the computer they feel like special that they are now using something which is more special so they feel like they are in the office that they can concentrate much better than in the classroom. So, in the classroom you can talk with a person who has slept but there they know that I am the one with the computer that I have to make sure that I have to listen to this person*.

I tried to be sensitive to the cultural issues, which gave rise to another contradiction. There was tension between learners sharing a computer to complete a computer-based task. The pace of interacting with the computer differed and caused one to wait endlessly for the other. This brought to my attention that the expectation of one of them of using the computer was challenged as his expectations were violated because there was an insufficient number of computers available to the number of learners enrolled in the programme.

4.7 FOUNDATIONS OF LEARNING AND ZONE OF PROXIMAL DEVELOPMENT

Well-connected and conceptually grounded ideas enable the participants to remember, link, transfer and make connections among ideas to solve new problems that require solutions via previously learned strategies (Stylianides & Stylianides, 2007:103). Nyvang (2006:2) posits that new tools of learning offer new possibilities for the participants such as engaging with computers in Own-Time as in this study. The old way of learning is replaced by the new one through the integration of computers.

The old way of learning has become part of the new manner of learning. This changes the old conditions of learning, which include classroom teaching and learning. Mji and Makgato (2006:254) assert that "out-dated teaching practices and lack of basic content knowledge have resulted in poor teaching standards". Contrary to what P3 claims, P8 contends: *I am pretty sure that learners who don't use the computer also become successful. I prefer face-to face teaching. I am old fashioned. Let me tell you that system you can drive three classes with one and see nothing, it just microwave[s] learners.*

Facilitators in this study used the ZPD in Own-Time to bridge the gap between what the learners could do using the computers for learning in Own-Time Level 2 without help, and what the learners could do with assistance. Facilitators were able to identify what learners already knew from AET levels 1&2. By identifying this prior knowledge, the facilitators could build on those skill sets when introducing new concepts.

P2 states: *So, you find that maybe if a learner cannot grasp at that particular time you can actually take the learner into the computer lab so that he or she can be alone there and then hearing the aids and then from there take him back again or you start in the classroom*.

ZPD was used as a benchmark to reinforce participants' level of development and understanding when engaging with computers for learning. Learners' understanding was facilitated by means of activities on the computer such as calculating averages, percentages, filling in the missing words, completing forms, and classroom discussions, both in the face-to-face environment and the computer lab. Facilitators focused on what the learners could do independently based on prior knowledge to link the already existing knowledge with knowledge that they could perform with their assistance. When learners continued to practice, they could perform some activities that were previously performed with assistance (Siyepu, 2009:159). The ZPD implies that at a certain stage in development, learners can solve a certain range of problems only when they interact with teachers and cooperate with peers (Borchelt, 2007:4).

The findings revealed that in both Full-Time and some Own-Time studies, some adult learners in the Level 3 AET class at the mine were not computer literate, and had never used the computer before, which posed a problem when they had to interact with the computer. P2 stated: *Most of them are illiterate so you have to treat them as babies. You have to go with them, step by step and then, especially in terms of the computers, there are those that didn't see even, they didn't see the computer. They just see the computer for the first time and they will tell you this is the TV. They don't know the computer. So, what are we doing? We just tell them this is the computer and then how do you use the mouse, how do you use each and everything on the computer but we are not focusing on those things. What we are focusing on are those programmes that they are using on the computer like communication as well as the numeracy so that is it*.

The AET programme does not include an introduction to computer classes to advance the learners before commencing with computers in the lab. This is a big gap in the programme. The findings revealed that it takes a great deal of time for the facilitators to go to individual learners and show them how to use the mouse, keyboard and monitor and other peripherals. The facilitator models a good grip for learners, and then assists them in changing their grip with a little practice. In the end,

learners are able to use the mouse, experiencing their zone of proximal development. It was evident that this prolonged exercise clashed with the multimedia notional times, since an introduction to computers was not provided for in the allotted times.

4.8 SUMMARY

This chapter reported the findings of the study related to the two AET learning environments and the participants' lived experiences. An opportunity was created to take the reader through the research process. Experiences were followed by the results of participant observation and the focus group interviews to map data collected from fieldwork and to elaborate on methods used for data collection. The construction of the eight-step model was used to interpret the activity under review. This was followed by the information systems success model by DeLone and McLean for developments in the use of computers for learning to demonstrate the quality of the AET programme used for this study. It was also demonstrated how contradictions were the driving force to innovation and transformation. Lastly, the focus was on the ZPD, which requires facilitators to be more knowledgeable in order to assist learners in gaining understanding of what they cannot do without assistance.

The findings suggest the contribution of this study, which will be discussed in the next chapter, along with a summary of the findings, conclusions and crucial recommendations.

CHAPTER 5
CONCLUSIONS, CONTRIBUTION, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY

5.1 INTRODUCTION

This final chapter presents the summary of the findings of the study, responds to the original research questions, and integrates the information by drawing conclusions of the study, followed by a discussion of the contribution of the study and its limitations. Finally, recommendations are proposed.

5.2 CONCLUSIONS OF THE STUDY

This study investigated the computer-based programme for training miners. The activity theory was identified to frame the study as it could map out the process of learning through the use of computers. Using the appropriate methods in the investigation, data collected yielded the findings. This study has outlined a number of examples of how the application of the methodology enabled the understanding of the complex issues related to the programme.

The findings not only facilitated the achievement of the objectives of the study, but also prompted reflection on activity theory. As a result, a theoretical modification of the AT is entertained in this chapter. The different perspectives of those within the activity system emerged more explicitly, and tensions and contradictions became more evident. Having read and taken into consideration articles about activity theory, and having been employed in studies of human-technology interaction for almost three decades offered me useful insights and guidance. The findings suggest a need to intensify the entire AET programme by including multimedia in the teaching-learning methodologies to train mine workers in computer-based skills, while considering the learners' needs, as cautioned in the contribution of the study by Clemmensen, Kaptelinin, and Nardi (2016). The intensification of the programme will instil confidence in adult learners and achieve best practice as well as return on investment for the organisation.

In Chapter 1 the research problem was identified, contextualised, motivated and stated, followed by its related questions. The problem was premised on the suppositions that underlie the programme used to train adult mine workers in computer-based skills. This was done with particular reference to the perspective of divergence of thoughts around teaching adult learners in the two AET learning environments in the mine to eliminate illiteracy among the workforce. The concepts which are suggested by activity theory were useful scaffolds in the examination of the use of computers for teaching and learning. These can be traced back to the work of Kaptelinin (2005:5), who contends that the concept of the object of activity is a promising analytical tool which provides the possibility of understanding not only what people "are doing, but also why they are doing it".

Chapter 2 presented a review of relevant literature and discussed the tool mediation and theoretical framework, which began with an overview of AT (see section 2.2). The work of seminal scholars who have contributed to the development of AT drove the discussions in the chapter. For instance, it was noted that Morf and Weber (2000:84) postulate that AT is a conceptual framework based on the idea that activity is primary, that doing precedes thinking, and that goals, images, cognitive models, intentions and abstract notions such as "definition" and "determinant" grow out of people doing things. Section 2.2.1 elaborates in detail on the genesis of the AT in this study and explains how in a complex world the activity of learning should be carried out, and what actions the participants should perform to bring the activity to its logical conclusion.

Section 2.2.2 was written in what could be labelled a personal narrative of what was anticipated within the activity system in the AET learning environments at the mine. The activity was directed at the object (computer/s) to contend with the emerging learning practices when a computer is introduced for teaching and learning by corroborating how adult learners acclimatise to learning new "ways of doing" things. It was presumed that if the object of the activity is maintained, it is possible to predict the results because the object requires the subject to be on point.

In section 2.2.3, Vygotsky's concept of the zone of proximal development (ZPD) was used to elaborate on the level of engagement of adult learners with computers as an intrinsic aspect of motivation in the study (Dicks, Soyinka & Coffey, 2006:78). Hardman and Ngambi (2003:10)

conceptualise this gap between unassisted and assisted performance as the ZPD, that "space" where learning leads to proximal development of skills.

New elements were introduced in the activity as contradictions (in section 2.2.4), which manifested themselves in the form of the limited technological access to some Own-Time and Full-Time learners, including methods of learning, values, beliefs and diversity, rules and the community, which were explored in the research field detail in Chapter 4. This chapter ended with a discussion of boundary crossing and its sources of potential difficulties. It concluded with how learners went into the unfamiliar territory of the computer lab and cognitive retooling that they brought to the domain as they learned to work independently and together as a collective in order to generate new ways of doing and knowing (Tsui & Law, 2007:1289).

The role of facilitators in addressing the challenges that adult learners faced every day as they engaged with the computer during classes was discussed. The discussion further covered the frustrations that the learners experienced at the hands of the information technology, and how the employed andragogy, as coined by Knowles and Associates (1984:180), as a teaching method is different from traditional pedagogy. As Adler and Ronda (2014:68) observe, South African teachers tend to implement traditional approaches in the classroom, which was also mostly evident in the Full-Time learning environment and some Own-Time teaching and learning in the AET environment of the mine. They start the learning day by revising the previous day's homework, demonstrating the new work with an example, and giving the learners some exercises to do. Mji and Makgato (2006:98) also perceive that out-dated teaching practices have caused poor teaching standards in South Africa.

Chapter 3 on the research methodology of the study was designed to elucidate the different understandings of the who, how and what in the study. For this reason, the research site and population were identified and justified in section 3.2, as well as the choice of the qualitative approach through interaction with participants to realise the findings of the study. The research design took the form of a qualitative case study, which provided an opportunity for discovery beyond that which is currently known, strengthened by the direct observations and data collection in a natural setting (Shavelson & Townes, 2002:99-106). The research methods and data collection

instruments yielded the findings of the study, guided by the AT and the articulation of Mwanza's eight-step model. This chapter also explained the analysis of the data with reference to the theoretical framework. The ethics and trustworthiness of the study were accounted for.

Chapter 4 presented the research findings arising from the data analysis according to the advancement of the participants in engaging with computers for teaching and learning in the context of the AT. The importance of the human activity in the study was contextualised for the purpose of teaching and learning with computers and contradictions in the environment were noted.

The findings revealed the following:

a) AET policy and procedure

- The AET policy was more focused on Full-Time than Own-Time learners because of the nature of its enrolment, which was not obligatory. Attendance in these classes was poor, which made it impossible to get a rounded picture of this learning environment.
- Learners' perspective was that even though the AET policy stated that preference was given to learners who had previously attended Own-Time, the selection of those learners was subjective.
- The policy did not state the kind of the programme envisaged for learning and timelines of completion except those provided by the service provider.

b) Integration of computers for learning

- The inadequate integration of computers for learning in the chosen mine was evident. The combination of multimedia and face-to-face learning was implemented only in one Own-Time learning centre out of the four AET centres. Even though learners in Own-Time used computers for learning, they could not tell which programmes they were busy with. However, interaction with this computer programme transformed learners' thinking.
- Facilitators set up the computer programme for learners, whose task it was just to navigate with the assistance of facilitators at the beginning. As time went by, learners

were able to navigate through the programme on their own by co-using the computers, which encouraged collaborative learning. Learning via the computer was more focused on the programme itself and not learning how to use the computer. Learners learned the required or planned skills just in time.

- The results regarding the primary area of this study, which included the evaluation of the effectiveness and value of the computer-based learning, cannot be conclusive. The investigation for the effective use of computers for teaching and learning was possible only at one Own-Time centre, which used a combination of face-to-face and multimedia teaching-learning.
- Good quality multimedia content with built-in tutors was appropriate for use in content design for first language speakers but was inappropriate for use by second language users without taking cognisance of their age and cultural beliefs.
- Examinations from the IEB were paper-based. A compulsory computer-based examination exercise would encourage the mine to use technology for learning effectively.

c) Attendance at Own-Time

- Learners were not released on time by supervisors from underground work to come to the surface to attend the afternoon classes. Lack of cooperation of some supervisors to release workers on time was revealed in the interviews.
- Even though learners had been taught how to read, write and speak in English, the influence of "Fanakalo" (unofficial language used specifically for communication in the mines) persisted as they spoke it among themselves and with supervisors when they sought clarity.
- During the interview responses showed that some social conditions that greatly affected learners' computer-based learning included underprivileged internet connectivity and lack of access to the computer lab, difficulty in learning on their own due to lack of computer infrastructure

d) Outcomes of the programme (literacy and numeracy)

- Despite the above, learners were able to express themselves in English. This made it possible for them to communicate, especially with their supervisors.
- The learners'/workers' performance at work improved a great deal, as can be gathered from their responses in Table 4.5. They even took the learning experience home as they were able to apply what they had learnt there as well. They gained confidence in themselves.
- Though facilitators might have experienced certain challenges, they played an important role by accommodating learners' diversity. That contributed to the positive outcomes of learning.
- Learners were now functionally literate and consequently could read and interpret their payslips, time sheets, memos and notices.
- Learners' literacy skills improved when facilitators provided them with opportunities to learn using the computer, or to implement what they had learnt during face-to-face classes in the computer lab.
- Interestingly, all these learners were characterised as indigenous, yet such indigeneity and age did not seem to influence the kinds of communal capital outcomes experienced. For example, learners in this study derived pleasure primarily from changes in how they articulated words in English and distinguished between the sums and the numerical signs when engaging with computers for learning.
- Examples learners gave regarding how the AET programme had impacted on their lives were proof that the programme had improved their literacy and numeracy skills, which made the difference in their lives, as seen during the focus group interviews.
- The interaction and collaboration which occurred as learners engaged with computers for learning enhanced their knowledge, skills, attitudes and beliefs and led to positive outcomes such as literacy and numeracy skills, and the more indefinable intrapersonal skills and traits of, for example, self-confidence and self-esteem and ability to do mathematical calculations

In the light of the summary of the study presented above, it is clear that the objectives of the study were achieved through the research activities. These objectives were as follows:

- To establish how the impact of the computer-based AET programme or training on the mine workers' can assist them to practically apply the knowledge and skills which they have acquired by:
    - showing understanding of written English through examining operational reports, and deviation reports of events;
    - verbally communicating in English with their supervisor and their fellow workers;
    - reading their payslips, their time-sheets, memos and notices sent via e-mail and interpreting them; and
    - doing basic mathematical or numerical calculations related to their duties using the computer.

5.3 CONTRIBUTION OF THE STUDY

This study was directed towards evaluating a programme used to train adult learners in computer-based skills in the workplace at this particular mine. The activity theory (AT) was the theoretical framework for the study. Engeström's AT (Figure 2.4) was used in the analysis and communication of the findings to establish the impact of the computer-based programme on the mine workers' learning and to address the emergent tensions and contradictions in the context of the study. Each transcribed interview was reviewed in detail. Annotations were made on the transcriptions to classify the discussions of each activity system element and the relationships among those elements. Often, interviewees focused on the tensions within or between the elements of the AT.

The main contribution of the study thus emerged from the revealed tensions and contradictions through the interviewees' responses and observations in systems analysis in tandem with the impact that the computer-based programme made on the mine workers' learning. The claim that this study therefore puts forward is that the activity system tensions provide rich insights into system dynamics and opportunities for the evolution of the system. The contribution of the study is further unpacked in the sub-sections that follow.

5.3.1 Contradictions between activity system elements

Contradictions are defined as historically accumulating structural tensions within and between the activity systems and they are the driving force of change (Engeström, 2001:137). The study creates awareness in the field about the context-based tensions and contradictions that may deny a smooth applicability of the activity system in the context, in this case the mine context.

5.3.2 Zone of proximal development

There was minimal evidence of Vygotsky's (1978) zone of proximal development (ZPD) and the notion of mediation in the computer-based learning environment in most of the AET learning centres at the mine. The contradictions revealed the connections between AT and the community of practice in the ZPD in the teaching and learning of adult learners. Instead of mediation, where a more competent peer or adult assists performance, bridging the gap between what the students know and what they can do, and what the student needs to know, this study revealed the participants' own understanding and experiences as a point of departure, mostly in face-to-face teaching rather than in the computer lab. Two categories of learners' thinking and problem solving were identified, i.e. those learners who were able to perform independently, and others who performed with some assistance from the facilitators.

Those learners who lay beyond the ZPD were those who could not perform even with assistance, and were registered at AET Basic Oral, where the mother tongue was often used to give clarity and to assist in the delivery of instruction. Learners' understanding at Own-Time and Full-Time classes in the mine was developed by means of activities, classroom discussions and exercises that were done outside and inside classrooms. The old practice of learning was expected to be part of the new practice of learning, since the new practice was represented by the tools, artefacts and computers for participants in this study (Chaiklin, 2003:98). This new practice led to the new disruptions and tensions which induced the new practice in learning. Participants were able to demonstrate the ability to select tools relevant for the object of the activity in Own-Time.

The teaching and learning situations in the mine investigated in this study put a critical demand to the applications of the ZPD and AT. By implication, this creates a need for a needs analysis prior to teaching adult learners in a computer-based programme, who mostly regard themselves as the

"borns-before-technology" (BBT). The conventional mining activities were characterised by a sophisticated technology, suggesting that employees needed to be equally brought up to speed technologically. However, in the southern world conventional industry meets with indigenous realities, and indigenous people. Thus, for learners from indigenous environments to cope well with exogenous interventions, and thus to rise to the ZPD, it is necessary for existing theories such as Vygotsky's and Engeström's to make space for these realities. The study teaches us not to put everyone on the fast track of development contained in conventional means, given their unique contexts. That calls for the rethinking of exogenous intervention programmes in which needs analysis and slower pace (especially in instances which involve adult learners) take precedence.

5.3.3 Subjects versus the Object

The findings during this investigation at Own-Time and Full-Time classes in the mine revealed varying degrees of uncertainty from adult learners as to why they were not using computers for learning. However, those who used computers for learning experienced contradictions in listening to the narratives of others on the computer-based lesson. It is the view in this study that Engeström's perception of AT might fall short on taking cognisance of the cultural backgrounds of adult learners who in the case of this research site were mostly migrant workers from the neighbouring indigenous contexts. Simply put, as indicated in 5.3.1.1, in today's technological society I could not comprehend how education could divorce itself from the culture in which adult learners were brought up and how they could view the technology-based kinds of intervention. Engeström's AT seems divorced from such realities.

Thus, the study casts insight onto the programmes that may disregard the background realities of those they target. The facilitators can be credited for the work that they have achieved with learners. Where they used the computer as a tool for teaching and learning, they seemed so blindfolded by the Media Works programme that they often disregarded the realities of the learners' contexts. For the programme to rob them of the use of their own language through enforcing English only for the sake of communication with their supervisors strengthens this claim. Efforts could have been made to expand the programme to train the supervisors and other seniors in the mine in indigenous languages as well. This is an ideal proposition for transformation in a democratic South Africa.

5.3.4 Full-Time and Own-Time attendance: A unique feature in a learning context

The use of AT as an analytical framework in this study was crucial in illuminating the different levels of appropriation in learners. Personal learning experiences and placement assessment at the beginning of the programme impacted the learners' level of appropriation. Intra-conflict as a contradiction was mainly evident in the Own-Time classes as learning was not compulsory. Despite the high enrolment, poor completion and poor attendance were reported by facilitators and centre managers. Possible reasons for this kind of conflict from the perspective of the participants were diverse: some participants had strong opinions about the efficacy of non-compulsory learning which resulted from shift work, overtime work and the biased selection process of learners' by management, and which prohibited some participants from attending the training. They felt that it was a deterrent to learning. The complexities of the situation at the mine, which compelled the training to be channelled according to these two groups, have a bearing on the AT as well. Accommodating these groups might not be easy. The dynamics are not the same, as can be seen in the findings. Therefore, in contexts such as the one in the mine under study, adopting any theory as is has the potential of breeding certain tensions and contradictions informed by the background and life experiences of learners.

5.3.5 Knowledge transfer

In this study, participants' development was identifiable during their interaction with the computers in one Own-Time class, both as individuals and as a collective. This suggests a shared object in the activity system. Participants' involvement was used as a platform for collaboration and meaningful transfer of knowledge and skills attributed to the development transfer that took place among learners. Participants in the study were exposed to the tensions and contradictions in their individual activity system, for instance lack of keyboard and mouse skills. They relied solely on facilitators for assistance in the beginning as the curriculum did not include an introduction to computers. AT was relevant for knowledge transfer as it provided the understanding of the activity of learning as a continuous engagement in which learners participated.

Based on the critical reflections on the AT presented above, therefore, I suggest a few theoretical modifications in the AT reflected in Figure 5.1. These are added to the expanded version of the

AT which was discussed in Chapter 2. In this study, Engeström's (1987) original concept of transformative learning by the co-construction of an object attracts some modification.

Engeström's (1987) concern that the individual and the collective human behaviour accompanied by the present and future do seem to merge, needs to be modified for one reason: pre-designed software operates from the individual conception of the designer, which may not always give the intended outcome, depending on the subject matter expertise and transformative thinking. Leontev (1978) contends that an activity is always anticipated for individual learners whereas Engeström (1987) argues that the form of an activity is projected for a collective. I argue that the individual subject expands the environment in which the activity takes place by creating the new context.

Lastly, Engeström's (1987) opinion that it is the projection from object to outcome that functions as the motive for this activity and gives meaning to the actions of individual learners requires modification. This study suggests that it is actually the projection from the subjects to the object that provides such motivation and facilitates the outcome. This is crucial, especially considering the need to design a computer-based programme from the point of view of a learner's needs, rather than only based on the needs of the mine.

Activity participants are defined as subjects that are interacting with objects to achieve desired outcomes. Leontev (1981) in Kaptelinin and Nardi, (2012:12) argues that human activities are directed towards their objects, as stated in the principle of object-orientedness. Furthermore,

In this study it is understood that subjects have needs which, when appropriately addressed, would enable them to carry out activities in order to satisfy their desire to engage with computers for learning. Learners carry out activities as they interact with objects in the AET programme. In other words, an action or activity is not only prompted by the characteristics of the object, but it is mainly driven by the attributes of the subjects.

The object component depicts the purposeful nature of human activity, which allows individuals to control their motives and behaviour when carrying out the activity. The AT is therefore about how subjects transform objects, and how the various components of the system mediate

transformation as an outcome. This suggested modification translates into the revised AT framework as presented in Figure 5.1. Used in such contexts, AT has implications for theory and practice and acknowledges not only processes and technology, but also people as subjects in the activity system.

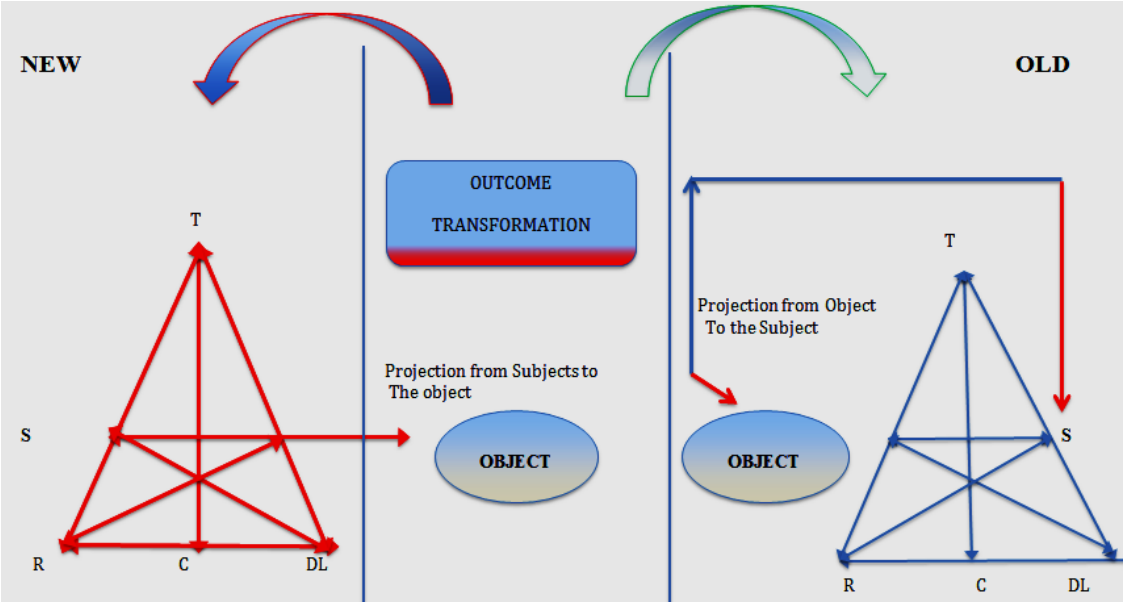

Figure 5.1: Revised expanded triangular model of Engeström

Key (T: Tool, S: Subject, R: Rules, C: Community, DL: Division of labour)

5.4 LIMITATIONS OF THE STUDY

The timing of this study for data gathering was not so favourable because of the sale of the old company to the new one, which came with a great deal of uncertainties, restructurings, retrenchments and redeployments. The information gathered could have been deeper and richer were it conducted outside of these constraints. Some participants in the study were colleagues; some of them were cautious and uneasy about participating because of a culture of mistrust between workers and management. This could have had a negative impact on openness and truthfulness in that respondents feared reprisal for speaking out.

Many employees declined to attend AET due to knocking off late from work, living far away from work and with no provision for transportation after overtime shifts. It was not always possible to

find a class of twenty or more learners in Full-Time and Own-Time because some learners deregistered before they reached their objective due to the language barrier, the distance between the employees' place of residence and work, and supervisors who would not release workers on time to attend the programme.

The criteria used for Full-Time registration, which shut out those workers who wanted to go directly into Full-Time without having registered for Own-Time, precluded workers from attending Full-Time studies. The primary area of this study, which included the evaluation of computer-based learning's' effectiveness and value, did not meet the anticipated outcomes of the curricula, hence facilitators needed to supplement the materials for learning.

Adult learners did not all have the same knowledge and skills in using the computer at the time of the investigation. Some had come a long way, having been using computers from home and previously at some Own-Time classes, but when they enrolled for Full-Time, they could not be afforded the opportunity to enhance the skill they already possessed.

The time frame for the study of participants when integrating with computers for learning should have been longer to understand and observe when the challenges encountered with the integration of computers were resolved, to also allow maturity of computer integration at all learning centres. When Full-Time and Own-Time studies are separated into two units, they lose the richness that is involved in real-world activities, making it difficult to make meaningful inferences from the situation.

5.5 RECOMMENDATIONS

5.5.1 At the level of practice

The AT framework was employed to evaluate the adopted computer-based programme used at the mine for training adult workers. The study addressed the questions that can be derived from Engeström's activity theory as guided by Figure 5.2.

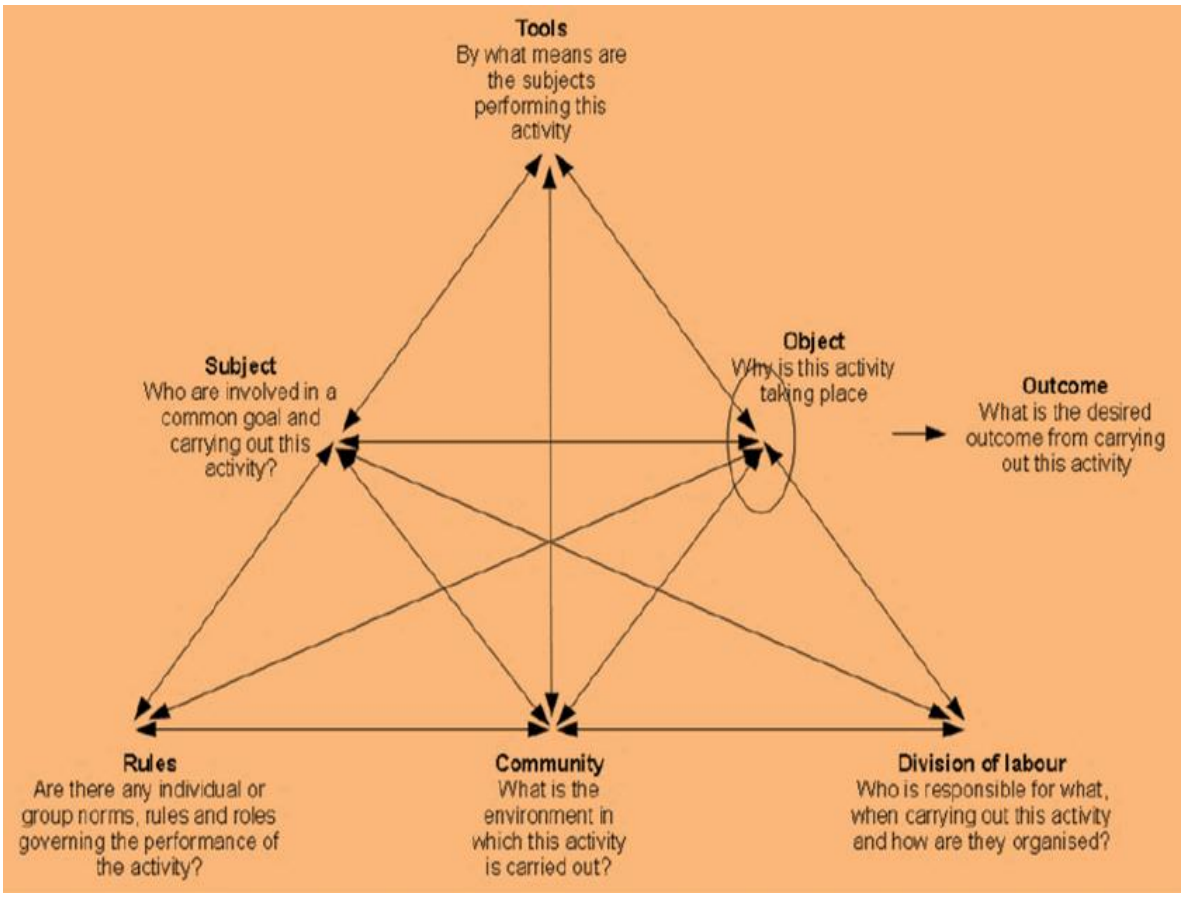

Figure 5.2: Activity system (adapted from Mwanza, 2001; Engeström, 2003)

a) By what means are the subjects performing this activity?

It is recommended that facilitators focus not only on using the old methods of teaching such as face-to-face but introduce interactive computer-based lessons to perform activities that require more contemporary teaching methods. The proper policy specifically for computer use needs to be developed and informed by the AET policy and procedures. A robust integration of systems in learning and up-to-date software needs to be introduced. The needs of the subjects (learners) should form the basis of the computer-based programme design. It is recommended that the two AET classes for permanent employees be combined, i.e. Own-Time and Full-Time as one class, and that separate Own-Time classes be created for community and contractor programmes.

b) Who are involved in the common goal and carrying out this activity?

Management at different levels need to be fully involved to monitor the implementation of the system vigorously. The learners, facilitators and all other stakeholders also need to be involved.

This would prevent the sloppiness of learners and supervisors in Own-Time so that learners could be released on time for studies. Learners' evaluation of the programme is deemed important for future improvement. This study recommends that learners be introduced to computing skills from the day they enrol for this programme to eradicate the fear of this object. Learners enjoy taking on the responsibility for their own learning, and when properly guided and prepared for a learning experience, they can achieve high levels of competency. This should thus be treated as the strength through which learners can be developed.

c) Why is this activity taking place?

The activity can contribute towards the development and growth of mine workers from one stage to another. According to Meyer (2002:360), development occurs when ongoing learning opportunities are created so that employees can improve and advance to maintain high levels of performance. This type of education includes the acquisition of basic skills of literacy and numeracy. This activity has the potential to change the lives of the workforce by educating the workers for their personal growth to the benefit of themselves and the external environment, thus ensuring sustainable development.

d) Are there any individual or group norms, rules and roles governing the performance of the activity?

The focus in the AET programme needs to be revisited to ensure that it is practical rather than theoretical through face-to-face classroom interaction. Learners need to be exposed to basic computer skills training before they are introduced to the actual computer programme, and nurtured to a point where they feel confident and supported and can stand on their own. Learner assessment should include a computer programme and not theory only.

e) What is the environment in which this activity is carried out?

The classroom and computer lab are two environments where learning takes place at the mine. The learning content should be the same as what is in the content developed for computer use, and not for facilitators to use supplementary material to augment learning content. The computer lab needs to have enough computers to accommodate every learner on the programme, or introduce a time-table for computer usage. Facilitators should not overlook learner support in the computer

lab and leave adult learners on their own to complete lessons. Support in the computer environment is essential due to the interactions needed in the lessons. Facilitators should use the combination of the two learning environments equally and not only be comfortable with face-to-face. Monitoring and evaluation of the two learning environments need to happen regularly, lest the objective of the programme is defeated.

f) Who is responsible for what when carrying out this activity and how are they organised?

Management of this mine, the mine's education department, facilitators and learners need to introduce a participatory development model aimed at successful technology procurement and implementation in the AET programme, in the following three phases: understanding the present state of an activity taking place; describing the goal state of the activity; and planning for the transformation to the goal state.

g) What is the desired outcome from carrying out this activity?

Technology needs to be left in the hands of the people who are willing to bridge the digital divide for adult workers, and see adult learners become transformed in executing their day-to-day tasks. It is recommended that the desired outcome demonstrate the ability of workers to see technology as an enabler in the mine, build up their confidence and rapport, and by so doing establish technology integration pioneers to enhance the learners' computer-based training to transform their lives. On completion, adults participating in the AET programme are awarded a National Qualification Framework (NQF) level one certificate.

5.5.2 At the level of research

The study creates a need for further research into the educational programmes of adult learners in mining contexts. These include the following:

- Further interrogation of the AT theory in terms of its suitability and applicability for a computer-based programme for adult learners.
- Exploration of other theories that could be used in the computer-based programmes for mine workers.

- Appropriate teaching approaches and strategies in a mining context for the adult learners who come from indigenous and other cross-border contexts.

5.6 REFLECTION

As I reflected on the experiences of writing this thesis, it dawned on me that I have really enjoyed most of this study and have put in an enormous effort to complete the project. It was a labour of love. Originally, I had no idea of what AET was about because it does not appear to enjoy a significant status in the educational realm, mainly because it does not take place in the formal mainstream of education. After spending more than six months in the AET environment, I have learned more than I ever could have hoped for. It was at times not easy to cope with my study and work. However, I managed to find a balance, and was intrinsically motivated to keep on keeping on.

Without reflecting on the knowledge and experience I have acquired through this study, this process would be incomplete. There were times when I became disillusioned when I could not comprehend when my arguments would finally become established enough to realise the final draft. These feelings were a blessing in disguise as they emotionally prepared me to experience a wonderful journey of research. With more reading and research, engagement with peers, and imbibing the helpful suggestions coming from my supervisor, the disillusionment evaporated in the air like steam. I am enthused by the way this study has enriched me academically and professionally.

This study gave me an opportunity to reflect on areas where the AET programme fell short in addressing the needs of adult learners. I termed some elements which are missing as essentials that could be integrated prior to the commencement of the programme, for example an introductory computer course to equip adult learners with the practical knowledge of how to use a computer and related computer programmes such as Microsoft Word, Excel and PowerPoint. I believe it is vital to assign a coach to learners during their studies. Furthermore, I would advocate forming a platform for the mentor-mentee relationship for those learners who have completed their studies so that they are guided and supported at work.

I have learned that the skills, knowledge and attitudes of the facilitator have a determining effect on the success or failure of an AET activity. Even though lack of professional qualifications for

facilitators did not preclude them from producing good learners, professionally qualified educators are needed for this programme.

It was during this journey that I came to realise that Own-Time studies are not well managed, compared to Full-Time AET studies. Some of the reasons mentioned would have required the intervention of organised labour to which these learners are affiliated, though nothing was done about this as it lay outside the scope of the study. Own-Time presented numerous blockages and constraints which impeded the progress of some learners enrolled in this programme, thus leaving them despondent. It was humbling, however, to recognise that even in these circumstances learners were able to learn, and could read, write and interpret information, and that was enough for me. I underestimated the potential of these adult learners, and I came out of this learning environment in awe. Moreover, I now know them and their capabilities and needs so much better.

Though learners in other Own-Time and Full-Time learning centres did not integrate computers in learning, the AET programme in general has transformed adult learners at this mine. Learners have become more accountable and responsible for their own learning and are relentlessly transferring the skills they have acquired in the programme to their counterparts. Most of the learners attested during data collection that their confidence was unshakable since attending these AET classes, and I have concluded that this study was not in vain. Other technical problems and concerns regarding this programme will be resolved through engagement with all involved, including management in the mine.

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APPENDIX A: REQUEST TO CONDUCT RESEARCH

P O Box 7392
Rustenburg
15 March 2015

The Head of HRD and Transformation
1 Old Mine Road
Rustenburg
0300

Dear Madam

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY AT THE MINE

I hereby request permission to conduct a research study at the four AET centres based at your mine in the North-West Province. The AET centres are for Full-Time and Own-Time learners. The purpose of my research is to evaluate the computer programme used for teaching and learning in AET Level 3 classes. The completed research will be submitted as part of my doctoral thesis.

Participants' identity shall be protected and participation shall be voluntary, and confidentiality shall be ensured. Data will be collected within a time frame of one month. Participants' withdrawal without reprisal will be accepted. Six facilitators, three centre managers as well as eight learners will be interviewed and recorded individually face to face. The findings of this study will assist the mine as an organisation to integrate computers for teaching and learning in AET classes.

To ensure that teaching and learning hours are not interrupted; interviews will be scheduled when facilitators have free periods or any other alternative time that can be arranged.

For more information kindly contact my supervisor at the University of South Africa: email: Gumbomt@unisa.ac.za Tel: 0124293339 or Cell: 0823258353.

I thank you in advance.

Yours Sincerely

Mpho J.M Segaole

APPENDIX B: PERMISSION TO CONDUCT RESEARCH

AngloAmerican

SECURITY CLASSIFICATION

PLATINUM

Rustenburg Platinum Mines Limited

ANGLO PLATINUM DEVELOPMENT CENTRE
Hexriver Complex
Old Mine Road
Rustenburg
0299
South Africa

Ms Mpho Lebeloane
c/o Anglo Platinum Development Centre
Hex River
Rustenburg

21 May 2015

Dear Mpho

PERMISSION TO CONDUCT RESEARCH FOR ACADEMIC PURPOSES

In reference to your submitted documentation from Professor MW Lumadi (Promoter – University of South Africa) that requires you to do research and collect data for the purposes of completion of your DED degree the Head of HRD and Transformation of Anglo American Platinum has favourably considered your application. This consideration is based on the following conditions that:

1. You distribute your questionnaires to employees via a manner that means minimal possible disruption of work flow.
2. The information gathered during your research will be treated with absolute confidentiality and would be used only for academic research purposes.
3. Participation of employees in your research is done on a voluntary basis
4. A copy of your research project will be made available to the company

To make a meaningful contribution to the performance of your organization during your research, please feel free to contact Gavin Brink, HRD Manager: Personal Development, to assist you with further information.

We wish you all the best in your studies.

Yours sincerely

Gavin Brink
HRD Manager – Personal Development
E: gavin.brink@angloamerican.com
D: +27 (0) 11 373 6763
M: +27 (0) 83 455 2652

A member of the Anglo American plc group

Anglo Platinum Development Centre
Business Address: Hexriver Complex, Old Mine Road, Rustenburg, 0299. P O Box 480, Kroondal, 0350, South Africa.
T +27 (0) 14 [illegible] F +27 (0) 14 [illegible]

Rustenburg Platinum Mines Limited
Registered Address: 55 Marshall Street, Johannesburg, 2001. P O Box 62179, Marshalltown, 2107 South Africa. T +27 (0) 11 [illegible] F +27 (0) 11 [illegible]
Incorporated in South Africa. Registration Number: [illegible]

Directors: [illegible]
Company Secretary: Anglo Operations Proprietary Limited

APPENDIX C: REQUEST FOR CONDUCTING INTERVIEWS

P O Box 7392
RUSTENBURG
0300
14 October2016

The Adult Education and Training Centre Manager
1 Old Mine Road
Rustenburg
0300

Dear Sir/ Madam

Re: Application for conducting interviews

I hereby wish to apply for permission to conduct research interviews at the AET centres in the mines. The purpose of my research is to evaluate the computer programme used for teaching and learning in AET classes. This research requires interviewing four facilitators for Own-Time and four facilitators for Full-Time classes responsible for teaching Level 3, and observing the lesson presentation during teaching lessons.

Participants' identity shall be protected and participation shall be voluntary and confidential. Participants' withdrawal without reprisal will be accepted. Interviews shall be scheduled with learners after lessons at the mine and facilitators when they have free periods or find alternative times when their schedule permits. The interview will take a maximum of fifteen minutes of each interviewee. Only observations will be conducted during the lessons. The completed research will be submitted as part of my doctoral thesis.

Thank you in advance.

Yours Sincerely

Mpho Joy Segaole

APPENDIX D: LETTER OF CONSENT

P.O. BOX 7392
RUSTENBURG
0300
15 NOVEMBER 2016

RE: A programme to train adult mine workers with computer based skill in the North-West

Dear participant

Hope you are well.

You are hereby invited to take part in the research study I am conducting at the mine. The purpose of my research is to evaluate the computer programme used for teaching and learning in AET classes in Level 3. By so doing, I wish to interact with you to learn more about your experiences, successes and challenges you are faced with in using the computer programme for teaching and learning.

The reason for selecting you to participate in the research study is based on the notion that you are facilitating AET classes at the mine and have knowledge of the subject matter.

Your participation in this research project is voluntary and confidential. In the event you show willingness to participate in this interview, confidentiality will be guaranteed and pseudonyms will be used so as to conceal your identity. The interview will take a maximum of fifteen minutes.

Kindly sign this letter as a pronouncement of your consent that you will participate in this research voluntarily without coercion.

Participant's signature Date……

Researcher's signature Date……

Yours Sincerely

Mpho Joy Segaole

APPENDIX E: PARTICIPANT OBSERVATION TOOL

Participant observation during teaching and learning

Date: _____ Presenter: _____
Location: _____ Observer: _____
Topic: _____ Role: _____

CATEGORY	RELATIONS IN AT	INCLUDES	POINTS NOTED
Subject	The subject was the focus of the study; for the purposes of this inquiry, the subject was the learner, who was learning through engagement with computers and was expected to come out of this learning environment skilled, so as to be productive at work and impart the knowledge acquired.		
Object	The object represented the motive for the existence of the activity by integrating computers in learning; and identifying limitations when engaging with computers and their impact on workers' performance on job.		
Tools	Computers and whiteboards were tools used to support the learning environment. They supported collaborative writing, and problem-solving as tools to act on learners' understanding and interaction with curriculum content		

Participant observation during teaching and learning

Date: _____ Presenter: _____
Location: _____ Observer: _____
Topic: _____ Role: _____

CATEGORY	RELATIONS IN AT	INCLUDES	POINTS NOTED
Rules	These were norms, conventions and social interactions of the classroom, which drove the subjects' actions and behaviour		
Division of labour	This was both vertical and horizontal and referred to the negotiation of responsibilities, tasks and power relations within a classroom as well as throughout the mine. In this study, the facilitator's role was to integrate computers in teaching and learners' roles were to learn.		
Community	The subject is a member of a community who participates in acting on the shared object, who is encouraged to get involved practically and becoming responsible for their own learning		

APPENDIX F: INTERVIEW QUESTIONS FOR AET LEVEL 3 OWN-TIME AND FULL-TIME FACILITATORS

Title: A programme to train adult mine workers in computer based skill in the North-West Province

Date:----------
Location:----------
Topic:_____

CATEGORIES IN AT	QUESTION	RESPONSE
Background	1. What professional / teaching qualification do you have?	
	2. Are you hired by Media Works as a contractor or by the mine as a permanent employee?	
	3. How long have you been teaching adult learners and what is your experience?	
	4. What are your experiences with the use of computers since you started using them for teaching and learning at this mine?	
	5. Do you teach the same lesson twice in the classroom face-to-face and also in the computer laboratory? If so what is the reason for that strategy?	
	6. Would you say this classroom setting makes your teaching more or less effective? Why?	
Subjects	7. Do you think a worker (learner) who is in production line, who is able to read and write English, will have a better understanding of what their job entails after completing this programme?	
	8. Since learners have enrolled in this class, are they able to express themselves in English or read e-mails, memos, letters, pay slips and time-sheets? How do you assist	

	those who still can't read them?	
	9. What is the importance of learner assessment at the inception of the course and after completing the course?	
	10. In the case of a learner who is not computer literate, do you enrol him/her in the AET programme, and how do you teach them to use the computer?	
Object	11. How do you provide support for learners who are seeing the computer for the first time? How do you ensure that they stay committed to using computers for learning?	
	12. AET is an outcomes-based programme. How does it provide learners with basic learning tools, skills and knowledge?	
	13. I saw that you encountered some technical problems with the computer How did that disturb your method of teaching? How do you intend to resolve this problem going forward?	
	14. Do you think learners want to do more work on the computer than the workbook and why?	
	15. Do you think it is possible to only teach by means of a computer at this centre and why?	
	16. What are the major obstacles to the effective use of the computer in your class?	
Community	17. Do you think learners can be motivated through seeing examples of what is possible? Why?	

	18. Do you think learners learn by simply getting involved? Why?	
	19. Is the computer-based learning content relevant for teaching and learning? 20. Does it need any supplementary material for enhancement?	
	21. Is there anything that you would like to add that we have not covered? **Thank you very much for participating in this study!**	

APPENDIX G: INTERVIEW QUESTIONS FOR AET LEVEL 3 CENTRE MANAGERS FOR OWN-TIME AND FULL-TIME

A programme to train adult mine workers with computer based skill in the North-West Province

Date: _____

Location: _____

Topic: _____

CATEGORIES IN AT	QUESTION	RESPONSE
Background	1. What professional / teaching qualification do you have?	
	2. Are you hired by Media Works as a contractor or by the mine as a permanent employee?	
	3. Is your service provider Media Works accredited with the council for quality assurance?	
	4. What is your role as a centre manager and your experience in an adult learning environment?	
	5. What challenges have you encountered with the integration of computers for teaching and learning and how were they resolved?	
Subject	6. What is the overall attendance of adult learners at the centre for teaching and learning and how do you ensure that both facilitators and learners stay committed to attending classes without fail? 7. As a centre manager, which time of the day is attendance of learners very satisfactory and why?	
	8. You mentioned earlier that you have community members attending AET classes. Are these community members mine employees?	
	9. Are teachers skilled to integrate computers for teaching and learning	

A programme to train adult mine workers with computer based skill in the North-West Province

Date: _____

Location: _____

Topic: _____

CATEGORIES IN AT	QUESTION	RESPONSE
Object	10. How do you ensure that both facilitators and learners stay committed to integrating computers for teaching and learning?	
	11. Facilitators have been teaching using more face-to-face methods than integrating computers for teaching and learning. How do you think integrating computers for teaching and learning will assist them?	
	12. Are all your facilitators skilled to use computers for teaching and learning? It looks like the integration of computers is not fully given attention. Why?	
	13. After completing this AET Level 3, are learners able to express themselves in English and read notices, memos e-mails, letters and pay slips and time-sheets?	
	14. What intervention mechanisms have you put in place for learners who are not competent at the end of the programme?	
	15. What challenges did facilitators experience with the integration of computers for teaching and learning at this centre and how were they resolved?	
	16. Which recurring technical problems with the computer were reported to you and how were they resolved?	

A programme to train adult mine workers with computer based skill in the North-West Province

Date: _____

Location: _____

Topic: _____

CATEGORIES IN AT	QUESTION	RESPONSE
	17. Do you think facilitators use computers fruitfully for teaching and learning or rely more on the classroom teaching method, and why is it the case?	
	18. How have you addressed the disadvantage of learners not engaging with computers for learning and what is your plan?	
Community	19. How did you make certain that facilitators assisted learners to achieve their desire to interact and to actively participate in using computers for learning?	
	20. Does the AET programme provide basic learning tools, knowledge and skills so that they can have a nationally recognized qualification?	
	21. If there were two things you could have done to see that learners fully use computers for learning, what would those be?	
	22. Can the learners (workers) practically apply the knowledge that they have acquired from the AET programme in their work environment successfully? Please explain.	
	23. What intervention mechanisms did the management of this mine make to ensure that integration of computers for teaching and learning takes place? 24. Is there anything that you would like to add that we have not covered?	

A programme to train adult mine workers with computer based skill in the North-West Province Date: _____ Location: _____ Topic: _____		
CATEGORIES IN AT	**QUESTION**	**RESPONSE**
	Thank you very much for participating in this study!	

APPENDIX H: INTERVIEW QUESTIONS FOR AET LEVEL 3 LEARNERS FOR OWN-TIME AND FULL-TIME

A programme to train adult mine workers with computer based skill in the North-West Province

Date: _____

Location: _____

Topic: _____

CATEGORIES IN AT	QUESTION	RESPONSE
Background	1. Are you a permanent employee of the mine or a contractor?	
Community	2. How did you learn about this AET programme offered at the mine? Were you nominated to attend this class or was it your initiative?	
	3. How long does it take you to obtain this qualification?	
	4. What motivated you to attend this AET programme and how is it going to benefit you at home and at work?	
	5. Before you attended this AET programme were you able to speak and communicate in English	
	6. Does the AET programme provide you with basic learning skills, knowledge and attitudes?	
	7. How is obtaining this qualification going to assist you at work?	
	8. Were you able to read documents in English before you started with this training?	
Object	9. Do you use the computer during this AET programme and does	

A programme to train adult mine workers with computer based skill in the North-West Province

Date: _____

Location: _____

Topic: _____

CATEGORIES IN AT	QUESTION	RESPONSE
	your job require that you use the computer to execute your tasks?	
	10. Are you able to use the computer without the assistance of the facilitator?	
	11. Are you able to read notices, e-mails, memos and letters, pay slips and time sheets?	
	12. Are you able to express yourself, read and write better in English than before you started with this programme?	
	13. Do you use the computer for learning at this centre, and if not, why?	
	14. What is the difference between learning through face to face and the computer? Which method do you prefer?	
	15. Are you motivated to use computers for learning?	
	16. Do you have access to a computer at work?	
	17. Do you think when using computers for learning you can improve your writing and that typing on the keyboard will help you finish faster?	
	18. Is it correct that when engaging with the using the computer you do not	

A programme to train adult mine workers with computer based skill in the North-West Province

Date: _____

Location: _____

Topic: _____

CATEGORIES IN AT	QUESTION	RESPONSE
	depend on the facilitator to get information?	
Subject	19. What motivates you to use a computer?	
	20. Are you able to apply the knowledge and skills that you have acquired from the AET programme at work?	
	21. Is there a noticeable change in your performance at work after passing examinations, and if so, what is it?	
	22. Has this AET programme improved your confidence?	
	23. How has your life improved since attending the AET programme, and will you recommend the employees to attend AET courses? 24. Is there anything you want to add that we have not covered? **Thank you very much for participating in this study!**	

APPENDIX I: LETTER OF CONSENT (LEARNER)

P.O. BOX 7392
RUSTENBURG
0300
15 NOVEMBER 2016

RE: A programme to train adult mine workers with computer based skill in the North-West

Dear participant

Hope you are well.

You are hereby invited to take part in the research study I am conducting at the mine. The purpose of my research is to evaluate the computer programme used for teaching and learning in AET classes. By so doing, I wish to interact with you to learn more about your experiences, successes and the challenges you are faced with in using the computer programme for teaching and learning.

The reason for selecting you to participate in the research study is based on the notion that you are an employee and a learner at this AET class. I would like to find out about the impact of this programme on your performance at work and in general.

Your participation in this research project is voluntary and confidential. In the event you show willingness to participate in this interview, confidentiality will be guaranteed and pseudonyms will be used to conceal your identity. The interview will take a maximum of fifteen minutes.

Kindly sign this letter as a pronouncement of your consent that you will participate in this research voluntarily and without coercion.

Participant's signature Date……

Researcher's signature Date……

Yours Sincerely

Mpho Joy Segaole

APPENDIX J: ETHICAL CLEARANCE CERTIFICATE

UNISA university of south africa

COLLEGE OF EDUCATION RESEARCH ETHICS REVIEW COMMITTEE

17 February 2016

Ref : **2016/02/17/53905695/45/MC**
Student : Ms MJ Segaole
Student Number : 53905695

Dear Ms Segaole

Decision: Ethics Approval

Researcher
Ms MJ Segaole
Tel: 014 591 1257
Email: mpho.segaole@angloamerican.com

Supervisor
Prof MT Gumbo
College of Education
Department of Science and Technology Education
Tel: 012 429 3339
Email: Gumbomt@unisa.ac.za

Proposal: A programme to train adult mine workers with computer based skills in the North West province: A case study

Qualification: D Ed in Adult Basic Education and Training

Thank you for the application for research ethics clearance by the College of Education Research Ethics Review Committee for the above mentioned research. Final approval is granted for the duration of the research.

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the College of Education Research Ethics Review Committee on 17 February 2016.
The proposed research may now commence with the proviso that:

1) *The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*
2) *Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should*

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

be communicated in writing to the College of Education Ethics Review Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.

3) *The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*

Note:

The reference number **2016/02/17/53905695/45/MC** *should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants, as well as with the College of Education RERC.*

Kind regards,

Dr M Claassens
CHAIRPERSON: CEDU RERC
mcdtc@netactive.co.za

Prof VI McKay
EXECUTIVE DEAN

APPENDIX K: DECLARATION OF EDITING THESIS

Declaration:
Editing of Thesis

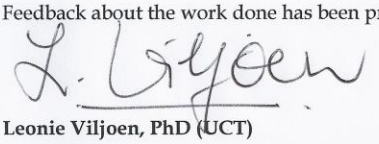
18 September 2017

To whom it may concern

Language Editing

This is to certify that I have edited the language of the thesis of Mpho Joy Segaole presented in fulfilment of the requirements for the degree Doctor of Education, Department of Didactics, University of South Africa, Pretoria titled: *A programme to train adult mine workers with computer based skill in the North-West Province: A case study.*

Feedback about the work done has been provided to the candidate.



Leonie Viljoen, PhD (UCT)

Language Practitioner

Cell: 082 9244 733

Technical editing

I, Ronel Gallie, acknowledge that I did the technical formatting, checking of reference list and cross-referencing of Mpho Joy Segaole's thesis. Feedback about the work done has been provided to the candidate.

Ronèl Gallie

Technical editor

084 7780 292

APPENDIX L: VERBATIM RESPONSES TO INTERVIEW QUESTIONS

RESPONSE TO APPENDIX F: INTERVIEW QUESTIONS FOR AET LEVEL 3 FULL-TIME FACILITATOR

PARTICIPANT 1

Title: A programme to train adult mine workers with computer based skill in the North-West Province **Date:** 19 April 2017 at 15:00	
Interviewer	Good afternoon, Sir
Interviewee	Good afternoon Mme
Interviewer	What professional / teaching qualification do you have?
Interviewee	I have certificate in AET
Interviewer	Are you hired by Media Works as a contractor or by the mine as a permanent employee?
Interviewee	I am a contractor employed by media works.
Interviewer	How long have you been teaching adult learners and what is your experience?
Interviewee	It is over five years in level 3
Interviewer	What are your experiences with the use of computers since you started using them for teaching and learning at this mine?
Interviewee	I am computer literate but at the moment we don't use them for teaching learners.

Interviewer	Do you teach the same lesson twice in the classroom face-to-face and also in the computer laboratory? If so what is the reason for that strategy?
Interviewee	I like to but no we don't reason being there are problems with computers still negotiating
Interviewer	Would you say this classroom setting makes your teaching more or less effective? Why?
Interviewee	Delivery of content happened within given time frames and communication in the classroom was encouraged
Interviewer	Do you think a worker (learner) who is in production line, who is able to read and write English, will have a better understanding of what their job entails after completing this programme?
Interviewee	Well, not all of them you know mos people pass and still not able to do work sometimes
Interviewer	Since learners have enrolled in this class, are they able to express themselves in English or read e-mails, memos, letters, pay slips and time-sheets? How do you assist those who still can't read them?
Interviewee	Yes and can also write English, those who can't I do remedial classes with them
Interviewer	What is the importance of learner assessment at the inception of the course and after completing the course?
Interviewee	It is important for placement at the right level
Interviewer	In the case of a learner who is not computer literate, do you enrol him/her in the AET programme, and how do you teach them to use the computer?
Interviewee	Ja, we enrol all of them for AET it is the policy

Interviewer	How do you provide support for learners who are seeing the computer for the first time? How do you ensure that they stay committed to using computers for learning?
Interviewee	Ours don't use computers at this present time but I am sure that problem will be solved soon
Interviewer	AET is an outcomes-based programme. How does it provide learners with basic learning tools, skills and knowledge?
Interviewee	They can read, type CV's, play in the computer games, listen to audios etc.
Interviewer	I saw that you encountered some technical problems with the computer How did that disturb your method of teaching? How do you intend to resolve this problem going forward?
Interviewee	Aah, I was just checking them they are collecting dust in the lab we still don't use them it is a pity
Interviewer	Do you think it is possible to only teach by means of a computer at this centre and why?
Interviewee	Not at this stage, may be when the learners are at FLC even though Level 3 gives them a good exposure possible but English is not their mother tongue and computer programs are written in English
Interviewer	What are the major obstacles to the effective use of the computer in your class?
Interviewee	So far it is lack of computers use and the policy which is silent about Own-Time
Interviewer	Do you think learners can be motivated through seeing examples of what is possible? Why?

Interviewee	Yes we motivate them in the morning when we assemble and encourage them to learn, they are adults, we worry if they are not motivated they will quit
Interviewer	Do you think learners learn by simply getting involved? Why?
Interviewee	Yes they do, they gain experience
Interviewer	Is the computer-based learning content relevant for teaching and learning?
Interviewee	Yes, the one I saw yes it is very much so, I can't wait to see them use it
Interviewer	Does it need any supplementary material for enhancement?
Interviewee	Of course with any syllabus you need extra material for enhancement
Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	If the mine can sort out the computer labs issue like at Own-Time and we start to use them then we will have done justice to this programme, the learners ask daily about them
Interviewer	Thank you very much, and I appreciate your time
Interviewee	Sharp, Sharp.

RESPONSE TO APPENDIX F: INTERVIEW QUESTIONS FOR AET LEVEL 3 OWN-TIME FACILITATOR

PARTICIPANT 3

Title: A programme to train adult mine workers with computer based skill in the North-West Province **Date:** 19 April 2017 at 12:51	
Interviewer	Good afternoon, Madam
Interviewee	Good afternoon
Interviewer	What professional / teaching qualification do you have?
Interviewee	I have certificate AET , Human Resources certificate and Train the Trainer
Interviewer	Are you hired by Media Works as a contractor or by the mine as a permanent employee?
Interviewee	I am a contractor employed by media works.
Interviewer	How long have you been teaching adult learners and what is your experience?
Interviewee	It is eight-year level 3
Interviewer	What are your experiences with the use of computers since you started using them for teaching and learning at this mine?
Interviewee	I know how to use the computer, my experience comes from own studying, here at Own-Time we don't use computers for teaching and learning for now, we have some learners from Own-Time who used computers before. My experience is learners love the computer.

Interviewer	Do you teach the same lesson twice in the classroom face-to-face and also in the computer laboratory? If so what is the reason for that strategy?
Interviewee	Yes, some do with maths most of the time as they are adult they have lot of things, it becomes easier for them when we do things practically in the computer we don't here
Interviewer	Would you say this classroom setting makes your teaching more or less effective? Why?
Interviewee	I like the setting because I can see all of them the one playing and the one who need attention and it encourages group work
Interviewer	Do you think a worker (learner) who is in production line, who is able to read and write English, will have a better understanding of what their job entails after completing this programme?
Interviewee	The external assessment bodies assess learners at Levels 1 to 4 in two semesters
Interviewer	Since learners have enrolled in this class, are they able to express themselves in English or read e-mails, memos, letters, pay slips and time-sheets? How do you assist those who still can't read them?
Interviewee	They can do, you see a group of learners at the corner for remedial lessons, they don't cope quickly so ja, I give this one work and go to attend them, so after sometimes they can speak in English and do maths exercises
Interviewer	What is the importance of learner assessment at the inception of the course and after completing the course?
Interviewee	Firstly we give them the assessment in order to check where we should place, them through placement assessment. Which we can identify their levels where they should go, for example, there are the level 3 learners that came

	directly to the class, some are from level 2 or some are from the beginning of the AET classes. Simply let me say we give them the placement test to check and see whether they are in the appropriate level. Unless the learner has passed level 2 and moves to level 3.
Interviewer	In the case of a learner who is not computer literate, do you enrol him/her in the AET programme, and how do you teach them to use the computer?
Interviewee	Most of the teachers/facilitators made concerted efforts to plan their lessons step-by-step in conjunction with learners' workbooks prepared by Media Works
Interviewer	How do you provide support for learners who are seeing the computer for the first time? How do you ensure that they stay committed to using computers for learning?
Interviewee	When they are in the computer they feel like special that they are now using something which is more special so they feel like they are in the office that they can concentrate much better than in the classroom. So, in the classroom you can talk with a person who has slept but there they know that I am the one with the computer that I have to make sure that I have to listen to this person.
Interviewer	AET is an outcomes-based programme. How does it provide learners with basic learning tools, skills and knowledge?
Interviewee	It has helped them a lot, the reason why I am saying that, especially if a learner has a level 3 qualification, he or she can be able to go the, to be a learner miner, to study to be a learner miner. Hence, in level 3, for an example, if I can give the example with mathematics, some of the things that we are doing, they are the things that they are applying at work. It is just that if they are not educated, they lose them as science, for example, the angles they will say, Ma'am, what is the name of that angle something like that in

	this way. But if you tell them about the 90 degrees and the 180 degrees, they are the things they are doing at work with science instead of knowing them. Like for an example, again one of the learners was telling me about the velocity and the distances, they used to speak them with *"Fanakalo"* whereby once they know these things, it is easier for them to do things. It is very interesting for them and those who have passed, they used to come back to us and appreciate a lot for what they have achieved.
Interviewer	I saw that you encountered some technical problems with the computer How did that disturb your method of teaching? How do you intend to resolve this problem going forward?
Interviewee	Oh, the computers we are having the problem to restart them, I think it has been a long time, Media Works was coming to fix up those computers but they are not working.
Interviewer	Do you think it is possible to only teach by means of a computer at this centre and why?
Interviewee	Yes and no depending on the level of learners and their culture and background. Why all of that they have fear of using the computer because they will be doing the listening, they will listen to the tutor through the computer and then answer the questions. In maths it will be similar and then face to face, as I am saying, it is much better because we are doing things practically somehow. With maths I prefer face to face, hence we can do things practically but with computer in maths, remember, you just have to listen and do what the tutor says you must do.
Interviewer	What are the major obstacles to the effective use of the computer in your class?
Interviewee	The main obstacles are the policies and procedures for getting computers and loading software, which needs to be reviewed, the policy is not flexible

Interviewer	Do you think learners can be motivated through seeing examples of what is possible? Why?
Interviewee	Ja, that one is very difficult, we used to have the motivational sessions, remember, they are adults with different problems. You will find out the, especially during the paydays, you will find out a learner is stressful, he will want to take some days, you know, talking to them, really, it makes things easier for us. We used to have the motivational talks, lot of motivational talks, we used to do with our principle even every Monday in our centre, we are having the assembly. Sharing with them and even ask, we tell them where we come from and how we have been able to be where we are, it was not hard. Motivating by talking, giving them the examples of people around them, they become motivated really.
Interviewer	Do you think learners learn by simply getting involved? Why?
Interviewee	Adult learners, remember, they have knowledge, as I am saying, from their work place, they have knowledge of applying things. So, here, we are just pulling a lot from them and then applying what they know by giving them more knowledge on what they have. So yes they learn a lot by getting involved.
Interviewer	Is the computer-based learning content relevant for teaching and learning?
Interviewee	Yes, they will be learning computer skills, they will be having the computer skills to start how to log in the computer, I mean, it is a skill there, logging in and logging out, they will be achieving a skill.
Interviewer	Does it need any supplementary material for enhancement?
Interviewee	Yes a lot because we have different exam boards who differ so we spoke to management about supplementary material

Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	Ok I can tell you AET has changed their life, the only disappointing part is, as I am saying, some when they move out from here, they don't get another progress that side of work, they go back to what they were doing. Which is really demoralising them.
Interviewer	Thank you very much, and I appreciate your time
Interviewee	Thank you.

RESPONSE TO APPENDIX F: INTERVIEW QUESTIONS FOR AET LEVEL 3 FULL-TIME FACILITATOR

PARTICIPANT 4

Title: A programme to train adult mine workers with computer based skill in the North-West Province **Date:** 17 April 2017 14:00	
Interviewer	Good afternoon, Madam
Interviewee	Good afternoon Mme
Interviewer	What professional / teaching qualification do you have?
Interviewee	I have Diploma in AET
Interviewer	Are you hired by Media Works as a contractor or by the mine as a permanent employee?
Interviewee	I am a contractor employed by media works.
Interviewer	How long have you been teaching adult learners and what is your experience?
Interviewee	Over five years
Interviewer	What are your experiences with the use of computers since you started using them for teaching and learning at this mine?
Interviewee	We don't use computers for now at Full-Time my experience is of personal knowledge and yes, I do share that with learners because they have smart phones.

Interviewer	Do you teach the same lesson twice in the classroom face-to-face and also in the computer laboratory? If so what is the reason for that strategy?
Interviewee	Not for now, I will like to yes
Interviewer	Would you say this classroom setting makes your teaching more or less effective? Why?
Interviewee	Ja, I can see who is not participating during lessons and give them attention and assistance
Interviewer	Do you think a worker (learner) who is in production line, who is able to read and write English, will have a better understanding of what their job entails after completing this programme?
Interviewee	There are special arrangements made by the mine for learners to write the subjects the learners did not achieve. In order to complete, say, my subject, numeracy, they need in total 210 hours in six months.
Interviewer	Since learners have enrolled in this class, are they able to express themselves in English or read e-mails, memos, letters, pay slips and time-sheets? How do you assist those who still can't read them?
Interviewee	Yes, some very much, well others background counts, where they come from is important
Interviewer	What is the importance of learner assessment at the inception of the course and after completing the course?
Interviewee	Learners are assessed for placement in the correct level
Interviewer	In the case of a learner who is not computer literate, do you enrol him/her in the AET programme, and how do you teach them to use the computer?

Interviewee	AET is not computer teaching only, that one is fastracking learners only, we have classroom teaching and learner pass without computer
Interviewer	How do you provide support for learners who are seeing the computer for the first time? How do you ensure that they stay committed to using computers for learning?
Interviewee	Well, it is difficult for now as they do not use computers
Interviewer	AET is an outcomes-based programme. How does it provide learners with basic learning tools, skills and knowledge?
Interviewee	When they go back to the shaft, they can work out sums, and speak well English with their supervisors
Interviewer	I saw that you encountered some technical problems with the computer How did that disturb your method of teaching? How do you intend to resolve this problem going forward?
Interviewee	I was just trying to start this computer to see if it will work, but haai you can't even start it
Interviewer	Do you think it is possible to only teach by means of a computer at this centre and why?
Interviewee	Not at all, these learners are not first language speakers, they are still learning English and struggling with time yes
Interviewer	What are the major obstacles to the effective use of the computer in your class?
Interviewee	The policy which tells that we can't install software on any mine computers, they are sitting there because of the installation problem and they are new new

Interviewer	Do you think learners can be motivated through seeing examples of what is possible? Why?
Interviewee	Yes, a lot seeing is believing, when they see examples they copy and learn how to use them
Interviewer	Do you think learners learn by simply getting involved? Why?
Interviewee	Yes, when they are involved they feel special and take charge
Interviewer	Is the computer-based learning content relevant for teaching and learning?
Interviewee	Yes it relevant but sometimes we add more information we get from the Internet
Interviewer	Does it need any supplementary material for enhancement?
Interviewee	Yes there and there where we need to extend knowledge
Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	AET changes the lives of the mineworkers who are willing to learn fast and wants to get promoted at work, and have a better life
Interviewer	Thank you very much, and I appreciate your time
Interviewee	Bye-bye sisi.

RESPONSE TO APPENDIX F: INTERVIEW QUESTIONS FOR AET LEVEL 3 OWN-TIME FACILITATOR

PARTICIPANT 5

Title: A programme to train adult mine workers with computer based skill in the North-West Province **Date:** 18 April 2017 at 15:00	
Interviewer	Good afternoon, Sir
Interviewee	Good afternoon
Interviewer	What professional / teaching qualification do you have?
Interviewee	I have Diploma in AET studying towards B.Ed. with UNISA and other managerial courses
Interviewer	Are you hired by Media Works as a contractor or by the mine as a permanent employee?
Interviewee	I am a contractor employed by media works.
Interviewer	How long have you been teaching adult learners and what is your experience?
Interviewee	Since 2000
Interviewer	What are your experiences with the use of computers since you started using them for teaching and learning at this mine?
Interviewee	At the moment we are using face to face, since the computers are not working we cannot say yes we are using them but yes I have got experience in using the computer as well.

Interviewer	Do you teach the same lesson twice in the classroom face-to-face and also in the computer laboratory? If so what is the reason for that strategy?
Interviewee	The computers they are not working I think nothing has been done the programme has not been installed yet. It was installed and then since these changes with the company the migration and all that so we lost most of the information.
Interviewer	Would you say this classroom setting makes your teaching more or less effective? Why?
Interviewee	All of them can see when I write sums, they can see me, I can see them
Interviewer	Do you think a worker (learner) who is in production line, who is able to read and write English, will have a better understanding of what their job entails after completing this programme?
Interviewee	Yes I believe so
Interviewer	Since learners have enrolled in this class, are they able to express themselves in English or read e-mails, memos, letters, pay slips and time-sheets? How do you assist those who still can't read them?
Interviewee	The learners can read from level 2 and speak English and do numeracy test
Interviewer	What is the importance of learner assessment at the inception of the course and after completing the course?
Interviewee	We can say which level they belong to by assessing them and placing them at the correct level
Interviewer	In the case of a learner who is not computer literate, do you enrol him/her in the AET programme, and how do you teach them to use the computer?

Interviewee	Yes we do. I think the use of computer is much, much better than doing face to face but depending on the group of learners that you have. Uh, so somehow face to face is also good but the computers are also good if they can use them after they face to face or before they do face to face, it is a, we are using it as a supplementary
Interviewer	How do you provide support for learners who are seeing the computer for the first time? How do you ensure that they stay committed to using computers for learning?
Interviewee	I support them by telling them not to be afraid to use computers, motivating them and teach them how to work on computer
Interviewer	AET is an outcomes-based programme. How does it provide learners with basic learning tools, skills and knowledge?
Interviewee	They write, they speak, and they speak, read and write when they are finished with the levels.
Interviewer	I saw that you encountered some technical problems with the computer How did that disturb your method of teaching? How do you intend to resolve this problem going forward?
Interviewee	These computers are not working, you can see I am trying hoping something will happen, yes they don't have software
Interviewer	Do you think it is possible to only teach by means of a computer at this centre and why?
Interviewee	I think it is possible if learners use computers daily each one sitting at his computer not sharing also face to face is good, we can use the two
Interviewer	What are the major obstacles to the effective use of the computer in your class?

Interviewee	So most of the time the complaint is that we are knocking off late, we are knocking off late, we are knocking off late. And then we also have the other thing that some of them are staying very far they have to travel by bus so, but that was resolved because last year we usually it is only two classes but last year they implemented another class to suit them because some of them are knocking off at 12:00 and then instead of waiting to come in at 15:00 in the afternoon we would start the 13:30 class. So, most of them I think it is those the knocking off late that is what they are complaining about.
Interviewer	Do you think learners can be motivated through seeing examples of what is possible? Why?
Interviewee	This programme has improved them there is a lot of difference because most of them came here usually when they come we assess them and then depending on what level they fall in we have got learners who progressed to even get a new job. Getting jobs from just being a learner they would call us and say now I have found a job somewhere because of AET.
Interviewer	Do you think learners learn by simply getting involved? Why?
Interviewee	Yes, those who don't come we parade them and then we go and speak to them and then we have got this form that we fill in whether they still want to come or not and then some would say yes, and they get involved
Interviewer	Is the computer-based learning content relevant for teaching and learning?
Interviewee	It is, since Media Works provides it and the mine signed with them agreement
Interviewer	Does it need any supplementary material for enhancement?
Interviewee	Yes I think so, you use face to face and then computer will be supplementary
Interviewer	Is there anything that you would like to add that we have not covered?

Interviewee	Because the AET programme here it is own time, it is like they are on their own you know, so, even if we come across a lot of challenges like the one I am just saying I just mentioned about knocking off late. Sometimes you will find that they are just being delayed because of the lift they call it the catch which takes the workers underground instead of you will find that the poor person knocked off around 02:00 in the afternoon but he only arrives here at 05:00 in the afternoon.
Interviewer	Thank you very much, and I appreciate your time
Interviewee	Thank you Mama.

RESPONSE TO APPENDIX F: INTERVIEW QUESTIONS FOR AET LEVEL 3 OWN-TIME FACILITATOR

PARTICIPANT 9

Title: A programme to train adult mine workers with computer based skill in the North-West Province **Date:** 20 April 2017 at 16:00	
Interviewer	Good afternoon, Madam
Interviewee	Good afternoon
Interviewer	What professional / teaching qualification do you have?
Interviewee	Diploma in AET
Interviewer	Are you hired by Media Works as a contractor or by the mine as a permanent employee?
Interviewee	I am a contractor employed by media works I don't have a teaching background
Interviewer	How long have you been teaching adult learners and what is your experience?
Interviewee	I have been teaching adult learners since 2005
Interviewer	What are your experiences with the use of computers since you started using them for teaching and learning at this mine?
Interviewee	My experience is that you can do and redo an exercise until you master it. After doing all activities in the lesson then if you obtain 60% in our programme and above then it shall give you the access to the next lesson.

	But if you get below then you remain at the same lesson until you redo, redo until you get it right.
Interviewer	Do you teach the same lesson twice in the classroom face-to-face and also in the computer laboratory? If so what is the reason for that strategy?
Interviewee	Yes, we do that. We do it especially for those who are fast tracking, for those that are slow learners, so if they are slow we have to take them again to the computer because they quickly forget like I have said sometimes they are too tired that you can talk but they can't hear you. Yes, because the method of teaching is not the same so I can teach you and the computer can teach you but we are not teaching the same.
Interviewer	Would you say this classroom setting makes your teaching more or less effective? Why?
Interviewee	Ja, I think it is more effective because as a facilitator I do my settings there is no rule on how the classroom shall be set, so, we used to plan our own setting so usually groups, group setting because we need learners not to follow one another. Like they are writing final exam, but to sit as if they will do group discussion so they are allowed to do that so the settings that we do depending on the facilitator and his or her classroom I think it is better. So much effective.
Interviewer	Do you think a worker (learner) who is in production line, who is able to read and write English, will have a better understanding of what their job entails after completing this programme?
Interviewee	The company receives a monthly report from the Media Works project coordinator which outlines the attendance and progress of each learner's and facilitator's performance.

Interviewer	Since learners have enrolled in this class, are they able to express themselves in English or read e-mails, memos, letters, pay slips and time-sheets? How do you assist those who still can't read them?
Interviewee	A lot, most of them better than when they started
Interviewer	What is the importance of learner assessment at the inception of the course and after completing the course?
Interviewee	To help us know where to place a learner ja, instead of maybe guessing according to the looks that maybe you know better, or you know much or you know nothing. So, at least if you do the assessment it helps us to know which level shall we put you.
Interviewer	In the case of a learner who is not computer literate, do you enrol him/her in the AET programme, and how do you teach them to use the computer?
Interviewee	Yes, we do. So, if we want to take them to computer centre there is a mouse in every computer and then we will train them we will ask if they have used the computer before. If the learner says I have never used a computer before then we will teach him or her how to use a mouse for a couple of days, how to use the keyboard and then from there we shall put the learners in the computer
Interviewer	How do you provide support for learners who are seeing the computer for the first time? How do you ensure that they stay committed to using computers for learning?
Interviewee	We can't ensure that but we know that the computer is very interesting so Ja everyone wants to use a computer so we see how interested they are when they are in the computer so they sometimes even ask Ma'am, where can I buy myself one because they feel special when using the computer because we are not only teaching them how to listen to the lessons in a computer we are also teaching them how to type their CV's and there are also online

	exercises on the computer we show them how to go online and research and do lessons online there.
Interviewer	AET is an outcomes-based programme. How does it provide learners with basic learning tools, skills and knowledge?
Interviewee	As mostly are underground workers, before they start working every day they assemble somewhere there at their team's different gangs and they are given instructions they are being reminded of these safety things. So, I think it is productive for them to learn because if the instruction is written in English if you have never been exposed to school then you will not understand or be able to read, because it is not everything that is written in "fanakalo". Sometimes they forget to write in "fanakalo" and only write in English, so, I think it is good for them.
Interviewer	I saw that you encountered some technical problems with the computer How did that disturb your method of teaching? How do you intend to resolve this problem going forward?
Interviewee	Ja, it disturbs especially if the network just decide to go off because if the learner is in the middle of lessons, then the network just go off then ja, it is a problem. Because at the end of the day even if a learner can continue he or she will not be able to move to the next level to the next lesson so, due to the network we have a really serious problem.
Interviewer	Do you think it is possible to only teach by means of a computer at this centre and why?
Interviewee	At this centre I don't think it can work because we have learners that are still learning vernacular so there is no vernacular computer and for the person that still needs to learn from basic oral there is a problem. And again I think mine people are used to this old teaching of face to face, the teacher should

	stand in front and write but though there are those who adapted to this style of teaching.
Interviewer	What are the major obstacles to the effective use of the computer in your class?
Interviewee	The turnaround time of the technician to resolve technical problems. I used to call media works then they would put the IT guys online so that we can speak. Then I am told directly what to do to fix the problem just immediately unfortunately network here is a problem it goes off in the middle of one getting assistance.
Interviewer	Do you think learners can be motivated through seeing examples of what is possible? Why?
Interviewee	Okay yes since they have been brought into this class they have been able to express themselves in English? We make sure that in the classroom we don't speak vernacular so they are trying hard.
Interviewer	Do you think learners learn by simply getting involved? Why?
Interviewee	Yes, when they are involved they do learn because they enjoy it
Interviewer	Is the computer-based learning content relevant for teaching and learning?
Interviewee	Yes, so much relevant.
Interviewer	Does it need any supplementary material for enhancement?
Interviewee	Yes, we do need supplementary in the classroom because if we can focus on the media works books only that will mean the learner will only know what is in the book. Like let me give you an example of a lesson of pronouns, in a book it is only just let me say I can call it introduction. It is not deeply explained but as a facilitator I can have my own supplementary work develop

	activities that I will give to learners that they will know more or much about the pronouns instead of knowing that she only refers to a woman and he only refers to a man. Meanwhile there are a lot of things that they should learn under that topic of pronouns so, supplementary is very much important. But although we have to buy from our own pocket, mine does not supply us.
Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	Yes, so, but finally we had a meeting with our bosses about supplementary teaching material and we suggested a certain book that they finally bought for us ja. But usually it is only one book that we have since meanwhile there are a lot of books that we think we can get that we think they can buy for us and books that we know that if we can have and use them as supplementary in the classroom learning can be much better.
Interviewer	Thank you so much for your time.
Interviewee	Thank you.

RESPONSE TO APPENDIX G: INTERVIEW QUESTIONS FOR AET LEVEL 3 SITE MANAGERS FOR OWN-TIME

INITIAL INTERVIEW TRANSCRIPT

PARTICIPANT 2

Title: A programme to train adult mine workers with computer based skill in the North-West Province **Date:** 29 March 2017 at 15:36	
Interviewer	Good afternoon ma'am.
Interviewee	Good afternoon madam.
Interviewer	What professional or teaching qualification do you have
Interviewee	Okay, I've got the….okay, I'll just call it ABET Diploma, I studied with UNISA
Interviewer	Are you hired by Media Works as a contractor or by the Mine as permanent employee?
Interviewee	I am hired by the mine as a permanent staff
Interviewer	Is your service provider Media Works Accredited
Interviewee	Yes it is
Interviewer	What is your role as a centre manager and your experience in an adult learning environment?
Interviewee	Most of them are illiterate so you have to treat them as babies. You have to go with them, step by step and then, especially in terms of the computers, there are those that didn't see even, they didn't see the computer. They just see the computer for the first time and they will tell you this is the TV. They

	don't know the computer. So, what are we doing? We just tell them this is the computer and then how do you use the mouse, how do you use each and everything on the computer but we are not focusing on those things. What we are focusing on are those programmes that they are using on the computer like communication as well as the numeracy so that is it.
Interviewer	What challenges have you encountered with the integration of computers for teaching and learning and how were they resolved?
Interviewee	The others are knocking off late. They work underground, Uhm, you see like, right now it's, it's around 4. They are not here they are still underground even now, the class starts from 3 to 5 but even those that came after 3, we just accommodate them and the classes will just decide maybe we can extend the time until 6 o'clock.
Interviewer	What is the overall attendance of adult learners at the centre for teaching and learning and how do you ensure that both facilitators and learners stay committed to attending classes without fail?
Interviewee	Attendance is not regular. As I already mentioned that its own-time, we are encouraging them at any time when they have time to come and attend depending on their shift which is important. Uhm for example if the class is busy with computer programme, let me say at 10 o'clock, from 10 till 12, and then maybe the other learner come at 1 o'clock, we'll just give him that opportunity to use the computer to finish what others were doing. So, facilitators agree to do overwork, I mean overtime. Yeah, it's their job, they get paid for that, six hours its facilitation time and for 2 hours leaners attend classes. Facilitators are so flexible in terms of any time when the leaners come; they help them because they don't always come at the same time. The others are working in the morning, the others in the afternoon, the others

	nightshift so any time when they come because they say its own-time. They are coming at their own-time.
Interviewer	As a centre manager, which time of the day is attendance of learners very satisfactory and why?
Interviewee	In the morning, the maximum number of learners coming for the classes is mostly community members. The maximum number of permanent employees comes in the afternoon because they are working morning shift. So, they do have that chance that they are coming in the afternoon.
Interviewer	You mentioned earlier that you have community members attending AET classes. Are these community members mine employees?
Interviewee	No, they are not, they are villagers who attend our ABET classes
Interviewer	Are teachers skilled to integrate computers for teaching and learning?
Interviewee	Yes, they are because those are the ones who are showing the learners how to use the computers, how to use the programme. Media Works show them how to facilitate those programmes to the learners. When Media Works come to programme the computers with their programme they are showing them how to use it. It doesn't take long.
Interviewer	How do you ensure that both facilitators and learners stay committed to integrating computers for teaching and learning?
Interviewee	You know there is one thing that I know especially for learners, they love the computers. I don't want to tell you a lie. They love the computers. You will see, if they are here, each and every one is focussing on the computer. They don't even want the disturbance. Unlike, if you are in the face-to-face class some of them, they are tired, they are sleepy because they come from work but when it comes to the computers each and every one is focussing on what

	they are doing. So, I can see that they love the computer, ja, they love the computer
Interviewer	Facilitators have been teaching using more face-to face methods than integrating computers for teaching and learning. How do you think integrating computers for teaching and learning will assist them?
Interviewee	The teachers are here for learners, they have to teach learners how to learn using computers. They don't have any choice. They have to do what the learners like most. If the other facilitator is not here at school, we just take all those learners and put them on the computer so that's how we are encouraging them to use the computers and then even the facilitators, if maybe I can see most of the time they don't bring the learners here. I can even tell them; you know what, you can even give them something to do, let me say, to type the CV, all those things, not just focussing on the Media Works programmes.
Interviewer	Are all your facilitators skilled to use computers for teaching and learning? It looks the integration of computers is not fully given attention. Why?
Interviewee	Yes the facilitators know how to use computers but mostly they use the classrooms teaching than computers because, here most of the time, they bring those who are maybe, they are ahead with their studies so they will just come to do their revisions in the computer lab, most of the time they do the programmes in the classroom.
Interviewer	After completing this AET level 3 are learners able to express themselves in English? Written notices? Read memos, emails, letters, payslips and time sheets?
Interviewee	Yes, they do, they can even do maths calculations, counting numbers in ascending and descending orders.

Interviewer	What intervention mechanisms have you put in place for learners who are not competent at the end of the programme?
Interviewee	We register the learner again to do the very same learning areas again, let me say he failed communication, he'll only do the communication for that level in exams. So that he can manage to get the certificate as well like the others. If, maybe the learner was not competent with 5%, let me put it that way, in those special exams, we just put them to those special exams but if maybe he failed with 15%, 20%, no, we would take him for the whole 6 months for more training.
Interviewer	What challenges did the facilitators experience with the integration of computers for teaching and learning at this centre and how were they resolved?
Interviewee	You know, as I already mentioned, the learners like computers so the facilitators, they even encourage them, you know, in our days they have to use computers especially at work because they are more interested in typing, knowing how to use, because most in their offices, they use the computers, they have become more interested if maybe they see somebody who is using the computer they become more interested, they also want to use the computer. Even the facilitators encourage them. There is no way that we can work in the office without knowing how to use the computer.
Interviewer	Which recurring technical problems with the computer were reported to you and how were they resolved?
Interviewee	The mine has adopted the policy and procedures, and has the implementation strategy in place.
Interviewer	Do you think facilitators use computers fruitfully for teaching and learning or rely more on classroom teaching method, and why is it the case?

Interviewee	They do them both, the learners like computers so the facilitators, they even encourage them
Interviewer	How have you addressed the disadvantage of learners not engaging with computers for learning and what is your plan?
Interviewee	Here at our centre learners and teachers use computers even though computers are not enough the learner ratio is 1:2
Interviewer	How did you make certain that facilitators assisted learners to achieve their desire to interact and to actively participate in using computers for learning?
Interviewee	I never experienced that a teacher will not be able to assist learners in the computer, because if learners do not go there they ask questions when they are going to use computers. Even for basic oral learners. Sometimes they do come just to give them, to show them how to use the computer to give them something to do on the computer.
Interviewer	Does the AET programme provide basic learning tools, knowledge and skills so that they can have a nationally recognised qualification?
Interviewee	Yes, it does
Interviewer	If there were two things you could have done to see that learners fully use computers for learning what would those be?
Interviewee	So, you find that maybe if a learner cannot grasp at that particular time you can actually take the learner into the computer lab so that he or she can be alone there and then hearing the aids and then from there take him back again or you start in the classroom, I will certainly encourage those two exercises.
Interviewer	Can the learners (workers) practically apply the knowledge they have acquired from the AET programme in their work environment successfully? Please explain?

Interviewee	Yes, I even have the video of two learners who come from previous programme we interviewed them, and say how the AET helped them because they do have a promotion now. The other one he just told me that he is in C1 from B level I'm not sure from B2 to C1 or what but is promoted at work and because of this other employees are motivated
Interviewer	What intervention mechanisms did the management of this mine make to ensure that integration of computers for teaching and learning takes place?
Interviewee	Assessment helps for placing learners in the right class for their level. Some have grade 12 when we assess that qualification we don't know how they have passed it, they belong to a lower level especially for Maths
Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	No ma'am thank you
Interviewer	We have come to the end of our short interview, thanks for your time Good bye.
Interviewee	Good bye Madam.

RESPONSE TO APPENDIX G: INTERVIEW QUESTIONS FOR AET LEVEL 3 SITE MANAGERS FOR OWN-TIME

INITIAL INTERVIEW TRANSCRIPT

PARTICIPANT 6

Title: A programme to train adult mine workers with computer based skill in the North-West Province

Date: 05 April 2017 at 12:48

Interviewer	Good afternoon Sir.
Interviewee	Good afternoon madam.
Interviewer	What professional or teaching qualification do you have
Interviewee	I have a teacher's degree.
Interviewer	Are you hired by Media Works as a contractor or by the Mine as permanent employee?
Interviewee	I am hired by the mine as a permanent staff
Interviewer	Is your service provider Media Works Accredited
Interviewee	Yes, Media works is a service provider but the quality assurance council, is UMALUSI
Interviewer	What is your role as a centre manager and your experience in an adult learning environment?
Interviewee	My role is I am a centre manager. I ensure that facilitators get the necessary support because they are outsourced, like I said, they are from Media Works. Media Works is a service provider. I ensure that whatever needs that they

	want, for instance, workshops, I also do quality assurance in terms of going to classes to ensure that all the gaps that they have, they are closed. We have computer learning here. The learners from level 1 till level 3 have days where they interact or they have their lessons online. The facilitators are the ones who guide them in completing whatever is necessary that needs to be completed, like, for instance, exercises or whatever form of assessment. So, I can say that most of our learners are completely literate because the facilitators took them through e-learning.
Interviewer	What challenges have you encountered with the integration of computers for teaching and learning and how were they resolved?
Interviewee	The dynamics are different at all times. Like I said, it is own-time. Sometimes when learners are tired, they don't come. Sometimes they go for overtime at work, they don't come but in most cases our learners are honest enough to report that some of them will be doing overtime. We also have community learners here. We struggle with them because they don't report when they did not come because some of them they are community workers, like I say, but they might be having day jobs maybe somewhere in town or in other entities where we do not know. So, when they do not come it is various reasons that you can attach that to. But, in most cases, like I said, it could be overtime or when the learners are sick and they do not report but we have come up with a mechanism to indicate to them that when they do not come they need to tell us the reason why they are not coming.
Interviewer	What is the overall attendance of adult learners at the centre for teaching and learning and how do you ensure that both facilitators and learners stay committed to attending classes without fail?
Interviewee	Well attendance at own-time is difficult because learners come at their own time. They are not forced. They come at their own time. It is out of free-will.

	It is self-dedicated learning. They are motivated to come on their own. As Malcolm knows, I liked it about adult learners. Adult learners are, they have an innate desire to do something. They see adult education benefitting them in terms of getting promotional positions at jobs. So, integrating of computer learning has helped them because at their work place sometimes they get an opportunity to get promoted and then they have to confront the computer so at least here they have an experience of working on the computer and then when they are promoted at their sites, they already know what is expected from them from computers. Now, in a sense, I can say they…like I said they are computer literate so whatever comes their way in terms of promotion at least they don't start from scratch, but already they have the background of computers.
Interviewer	As a centre manager, which time of the day is attendance of learners very satisfactory and why?
Interviewee	Afternoon lessons are always satisfying because the learners come here after their shifts. In the morning, it's a bit difficult because most of them are at work but in the afternoon the majority of them have knocked off. That is when we get a huge number of them coming to attend.
Interviewer	You mentioned earlier that you have community members attending AET classes. Are these community members mine employees?
Interviewee	So, maybe just to give you some more information on community members. In the past, we used to have community members that were called cadets. They were taken from other dedicated centres and given mining skills so that in the long run they can be given permanent employees.
Interviewer	Are teachers skilled to integrate computers for teaching and learning?
Interviewee	The facilitators were given a workshop by Media Works. The Media Works have a programme called Navigate. Navigate was introduced to the

	facilitators. They were given a workshop on it. All the facilitators were taken through that course so as far as my understanding goes everybody is skilled to conduct e-learning.
Interviewer	How do you ensure that both facilitators and learners stay committed to integrating computers for teaching and learning?
Interviewee	The policy is followed by all involved in selecting adult learners to attend AET studies
Interviewer	Facilitators have been teaching using more face-to face methods than integrating computers for teaching and learning. How do you think integrating computers for teaching and learning will assist them?
Interviewee	Well face to face can be used as maybe a supplement to sort of cement what has been taught on the computer because for me, e-learning is the way now. Even learners can ask questions through e-learning. Learners are there, they see lessons face to face. If they have to ask questions it is then that they can rope in the facilitator but I feel that because the world of education has changed, it is important that leaners have to be computer literate. Facilitators just have to act as supplements.
Interviewer	Are all your facilitators skilled to use computers for teaching and learning? It looks the integration of computers is not fully given attention. Why?
Interviewee	If they are not conducting e-learning it could be maybe one of the facilitators who came after the Media Works computer-based workshop. I can say that could be the reason why they are not familiar with the programme Navigate because when it was given to the all the facilitators who were present at that time, maybe they were absent.
Interviewer	After completing this AET level 3 are learners able to express themselves in English? Written notices? Read memos, emails, letters, payslips and time sheets?

Interviewee	Exactly. I have always been a champion that education should benefit learners especially in the mining environment. The most important thing that I always emphasis is, like you say, interpretation of the payslip. The learner needs to know how much has been deducted mathematically. How much incentive has been put in their pay? They have to give reports at work, either verbally or written. That is why I always champion the cause that whatever we teach, adult education has to be relatable to the outside world like at the workplace or even in town. They have to know how to fill in forms either in banks or when opening accounts. Now, that is the knowledge that they master here at adult education. It has to be beneficial to them.
Interviewer	What intervention mechanisms have you put in place for learners who are not competent at the end of the programme?
Interviewee	Learners who are not competent at the end of the programme are given remedial classes. The company has come up with a plan that immediately after results are released or before results are released, everybody should sort of close the gaps. The gaps that they experienced during examination should be filled so learners who had complaints about certain areas of the subject matter or certain areas of the examination paper, they send them to facilitators so that they can close those gaps so that if they are not yet competent it means the next examination session they know that they have done the whole range and all the gaps have been identified and all the gaps have been closed, and these learners are given an opportunity to rewrite
Interviewer	What challenges did the facilitators experience with the integration of computers for teaching and learning at this centre and how were they resolved?
Interviewee	For now, they rely more on classroom methods because they are deficient in computers.

Interviewer	Which recurring technical problems with the computer were reported to you and how were they resolved?
Interviewee	Ja, we have experienced some technical problems like in the centre we started the Navigate programme. It went well for some time and then after some time because of technical glitches or technical problems unfortunately, we can't access Navigate in all the computers. We tried to call the technician who installed the Navigate programme. They promised to come but they have not yet come.
Interviewer	Do you think facilitators use computers fruitfully for teaching and learning or rely more on classroom teaching method, and why is it the case?
Interviewee	Yes, they rely more on face-to-face the challenge is computers
Interviewer	How have you addressed the disadvantage of learners not engaging with computers for learning and what is your plan?
Interviewee	We had a meeting with the service provider where we highlighted the plight that we have with computers. Now, the service provider, as in Media Works promised that they will sort out the problem but they haven't sorted it out and because the programme is their programme means we have to go back to them to ask them what is causing the delay in sorting out the problem.
Interviewer	How did you make certain that facilitators assisted learners to achieve their desire to interact and to actively participate in using computers for learning?
Interviewee	I never experienced that a teacher will not be able to assist learners in the computer, because if learners do not go there they ask questions when they are going to use computers. Even for basic oral learners. Sometimes they do come just to give them, to show them how to use the computer to give them something to do on the computer.

Interviewer	Does the AET programme provide basic learning tools, knowledge and skills so that they can have a nationally recognised qualification?
Interviewee	Yes, it does. Learners also come to adult education centres because when learnerships are given there is a certain or there is a minimum requirement in terms of education like in the past it used to be level 3, now they want FLC so it means the learner knows that if they don't have FLC they will not get the learnerships so they come here. They want to see themselves going through level 3 and then qualifying for learnerships to become better people.
Interviewer	If there were two things you could have done to see that learners fully use computers for learning what would those be?
Interviewee	I would have more computers because we only have 10 now. I could maybe have 2 computer rooms so that if there is a more need in terms of using computers we should not struggle. The second thing is that I would've loved that the technician would be very close onsite so that if we encounter a technical problem then it is attended to speedily
Interviewer	Can the learners (workers) practically apply the knowledge they have acquired from the AET programme in their work environment successfully? Please explain?
Interviewee	They can because in the NQF 1 curriculum in communication for instance, there is a part where you have to do what we call an oral assessment. An oral assessment benefits the learners when they go for interviews. They are in a state where they can answer questions. They can sell themselves to the panel that is interviewing them. The leaners now; we have taught them how to write reports like for instance in the mine environment there are incidents, there are accidents, they can be witnessed, they can be reported either verbally or in written form and the medium of instruction that is done it is in English to our learners, I can give you an example, like Mozambique nationals, they

	come to South African deficient in the English language but they go out of the centre knowing how to express themselves in English. They can articulate themselves very well so it is beneficial to them.
Interviewer	What intervention mechanisms did the management of this mine make to ensure that integration of computers for teaching and learning takes place?
Interviewee	The company is responsible for registering as an Examination Centre and for registering learners for examinations, not the service provider.
Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	Just to give you a bit of background before we finish, majority are learners who work underground because remember underground the learners they are used to use Fanakalo when they communicate. Now, Fanakalo, it is a language that the miners decided to discontinue because the medium of communication at the mines now is English. Any learner who comes here wants to communicate in English. Most of them are sent here because the English language is the language that is used in the business world so most of them they work underground, they do speak in Fanakalo but the mine wants to move away from Fanakalo and use English.
Interviewer	We have come to the end of our short interview, thanks for your time, Sir. Good bye.
Interviewee	Good bye Madam.

RESPONSE TO APPENDIX G: INTERVIEW QUESTIONS FOR AET LEVEL 3 SITE MANAGERS FOR OWN-TIME

INITIAL INTERVIEW TRANSCRIPT

PARTICIPANT 7

Title: A programme to train adult mine workers with computer based skill in the North-West Province

Date: 19 April 2017 at 10:42

Interviewer	Good afternoon Madam.
Interviewee	Good afternoon ma'am.
Interviewer	What professional or teaching qualification do you have
Interviewee	I have a BA honours in training and Education
Interviewer	Are you hired by Media Works as a contractor or by the Mine as permanent employee?
Interviewee	I am hired by the mine as a permanent staff
Interviewer	Is your service provider Media Works Accredited
Interviewee	Yes, Media works is a service provider
Interviewer	What is your role as a centre manager and your experience in an adult learning environment?
Interviewee	My role as a centre manager to is to oversee the day to day running of the AET centre, learners and facilitators and to monitor learner improvement and facilitator commitment. I ensure that most facilitators get the necessary support who are not mine employees and are intimidated by the mine policies and procedures if there is a grievance from learners who are permanent employees.

Interviewer	What challenges have you encountered with the integration of computers for teaching and learning and how were they resolved?
Interviewee	So far I can't say much as we are not using computers at this centre, the biggest challenge is that they are locked in computer lab.
Interviewee	Here learners have a choice to attend when they have time, so attendance cannot be compared with Full-Time which has a policy covering them and having full salary while attending classes. Here the learners sometimes work overtime because they are paid extra money so they choose what is best for them which is pay.
Interviewer	As a centre manager, which time of the day is attendance of learners very satisfactory and why?
Interviewee	Mostly learners honour the afternoon classes especially those working morning shift. In the morning mostly the attendance is a bit low
Interviewer	You mentioned earlier that you have community members attending AET classes. Are these community members mine employees?
Interviewee	With the community learners, honestly speaking, I do not follow their performance record afterward but I normally advise them to further their studies, like going to the FET colleges and maybe keep on checking our advertisement in terms of jobs.
Interviewer	Are teachers skilled to integrate computers for teaching and learning?
Interviewee	Media Works trains all facilitators before they come on board. The Media Works have a programme called Navigate which is platform used for learning via a computer
Interviewer	How do you ensure that both facilitators and learners stay committed to integrating computers for teaching and learning?

Interviewee	The business operation human resource development (HRD) managers, through their staff, assume responsibility for annual planning and setting of AET targets and staff requirements to meet the said targets; that when policy is reviewed learners and facilitators are engaged minimally, whereas they are the parties involved in the teaching-learning process.
Interviewer	Facilitators have been teaching using more face-to face methods than integrating computers for teaching and learning. How do you think integrating computers for teaching and learning will assist them?
Interviewee	Our system uses both, face to face and computer system, though here it doesn't help because we only use face-to-face and not computer-based learning. Computers can improve learning a lot if given a chance.
Interviewer	Are all your facilitators skilled to use computers for teaching and learning? It looks the integration of computers is not fully given attention. Why?
Interviewee	Yes they are skilled Media Works trained them before they can teach the learners.
Interviewer	After completing this AET level 3 are learners able to express themselves in English? Written notices? Read memos, emails, letters, payslips and time sheets?
Interviewee	Learners are able to read, write and express themselves in English very well, you know learners differ some are fast others are a bit slow, they can even calculate the distance and square meters.
Interviewer	What intervention mechanisms have you put in place for learners who are not competent at the end of the programme?
Interviewee	After learners were identified, the learners' learning potential was formally assessed using the following two methods: firstly, the LPCAT was conducted

	and secondly, interviews were conducted by a mini panel consisting of operations HRD and direct supervisors.
Interviewer	What challenges did the facilitators experience with the integration of computers for teaching and learning at this centre and how were they resolved?
Interviewee	Attendance in Own-Time is poor
Interviewer	Which recurring technical problems with the computer were reported to you and how were they resolved?
Interviewee	We have network problems, we have new computers bought last year and are not being used collecting dust therefore we are unable to use the computer programme called Navigate. Ja, the mine policy it doesn't allow us to install software even though licenced in their computers.
Interviewer	Do you think facilitators use computers fruitfully for teaching and learning or rely more on classroom teaching method, and why is it the case?
Interviewee	For now, they use face-to-face in the classroom because there is an issue with computers in most of the centres, same problem of installation.
Interviewer	How have you addressed the disadvantage of learners not engaging with computers for learning and what is your plan?
Interviewee	The meeting was held with mine Education sector to discuss the disadvantage caused to learners not using the computers for learning and a promise was made to sort that out when the new mining company concludes the sale of the old mine.
Interviewer	How did you make certain that facilitators assisted learners to achieve their desire to interact and to actively participate in using computers for learning?

Interviewee	For now I can say nothing much because we do not use computers for learning.
Interviewer	Does the AET programme provide basic learning tools, knowledge and skills so that they can have a nationally recognised qualification?
Interviewee	Yes, it does.
Interviewer	If there were two things you could have done to see that learners fully use computers for learning what would those be?
Interviewee	I think it's to make sure that each and every employee after completion ehm, when we sent him or her to the operation there is this I don't know how to put it, after they finish, you know, we hand them to someone who will take care of them in terms of education again or in terms of ja, I think if our employees, after they complete with us here at the AET, when they reach their operation they could have mentors who could help them to grow in terms of the education to further their studies.
Interviewer	Can the learners (workers) practically apply the knowledge they have acquired from the AET programme in their work environment successfully? Please explain?
Interviewee	The AET programme is really improving the lives of our learners/employees. Why do I say that is because basically when I arrived at the mine we had employees who were seriously illiterate. Those employees could not write, speak or read in English so up to this stage we have really improved their lives because they are now able to go to the banks, they are able to write. They can read, they can write, they can express themselves with the managers, they can use calculator to do some sums. Some of them got promotions and we normally have certification ceremony in the past and we gave learners opportunity to come and motivate others and they get impressed on how they will explain how the AET have changed their lives.

Interviewer	What intervention mechanisms did the management of this mine make to ensure that integration of computers for teaching and learning takes place?
Interviewee	After learners were identified, the learners' learning potential was formally assessed using the following two methods: firstly, the LPCAT was conducted and secondly, interviews were conducted by a mini panel consisting of operations HRD and direct supervisors.
Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	Attendance here at Own-Time is our serious challenge. As you know that if somebody attends as he or she wish it is difficult to account for that kind of a person but I believe if the operation, maybe they could implement something like part-time, that's my wish. If those employees, because this AET institutions are for the employees, if they could let them maybe attend, maybe they work for 6 hours then 2 hours of that time they come and attend so that they could account for attending. That's the one thing I wish the management could consider in the operations.
Interviewer	We have come to the end of our short interview, thanks for your time, Good bye.
Interviewee	Good bye.

RESPONSES TO APPENDIX G: INTERVIEW QUESTIONS FOR AET LEVEL 3 SITE MANAGERS FOR FULL-TIME

INITIAL INTERVIEW TRANSCRIPT

PARTICIPANT 8

Title: A programme to train adult mine workers with computer based skill in the North-West Province

Date: 25 January 2017 at 10:48

Interviewer	Good afternoon Sir.
Interviewee	Good afternoon sister.
Interviewer	What professional or teaching qualification do you have
Interviewee	I have passed Grade 12
Interviewer	Are you hired by Media Works as a contractor or by the Mine as permanent employee?
Interviewee	I am hired by the mine as a permanent staff
Interviewer	Is your service provider Media Works Accredited
Interviewee	Yes, Media works is a service provider
Interviewer	What is your role as a centre manager and your experience in an adult learning environment?
Interviewee	So, here for these people my role is going extra mile by doing some motivation for them before they start the day. Facilitators rely on us for motivation.

Interviewer	What challenges have you encountered with the integration of computers for teaching and learning and how were they resolved?
Interviewee	The policy does not specify the delivery mode of teaching and learning; however, the AET programme consists of multimedia and face-to-face teaching and learning but lessons are mostly delivered via face-to face.
Interviewer	As a centre manager, which time of the day is attendance of learners very satisfactory and why?
Interviewee	With us at Full-Time our classes starts at 7h00 until 16h00 daily for employees only no communities or Own-Time attendance is fine.
Interviewer	Are teachers skilled to integrate computers for teaching and learning?
Interviewee	All these teachers especially the old ones Media works trained them, you see the new ones use face-to-face more than computers which are not used for now
Interviewer	How do you ensure that both facilitators and learners stay committed to integrating computers for teaching and learning?
Interviewee	I am pretty sure that learners who don't use the computer also become successful. I prefer face-to face teaching. I am old fashioned. Let me tell you that system you can drive three classes with one and see nothing, it just microwave[s] learners.
Interviewer	Facilitators have been teaching using more face-to face methods than integrating computers for teaching and learning. How do you think integrating computers for teaching and learning will assist them?
Interviewee	I am not sure, may be it will help

Interviewer	Are all your facilitators skilled to use computers for teaching and learning? It looks the integration of computers is not fully given attention. Why?
Interviewee	Sisi mostly the old ones, when we start to use computers Media Works will train them
Interviewer	After completing this AET level 3 are learners able to express themselves in English? Written notices? Read memos, emails, letters, payslips and time sheets?
Interviewee	Yes, they do
Interviewer	What intervention mechanisms have you put in place for learners who are not competent at the end of the programme?
Interviewee	Teachers go ….extra extra mile so that all learners pass
Interviewer	What challenges did the facilitators experience with the integration of computers for teaching and learning at this centre and how were they resolved?
Interviewee	Not a single day must I allow any person to sit in that computer class, learners who don't use the computer also become successful.
Interviewer	Which recurring technical problems with the computer were reported to you and how were they resolved?
Interviewee	For now there is nothing, eeh, last time we were used them we had network problem and sisi here there is a policy you don't put anything in the mines computers, nah.
Interviewer	Do you think facilitators use computers fruitfully for teaching and learning or rely more on classroom teaching method, and why is it the case?
Interviewee	No, not at this stage at Full-Time

Interviewer	How have you addressed the disadvantage of learners not engaging with computers for learning and what is your plan?
Interviewee	The plan is to first fix the IT problem for these computers
Interviewer	How did you make certain that facilitators assisted learners to achieve their desire to interact and to actively participate in using computers for learning?
Interviewee	But I don't see it happening here how did that man learn more to do maths and write without the computer? Why do you ask me that question?
Interviewer	Does the AET programme provide basic learning tools, knowledge and skills so that they can have a nationally recognised qualification?
Interviewee	Yes
Interviewer	If there were two things you could have done to see that learners fully use computers for learning what would those be?
Interviewee	They are still learning well without computers, see us we did not use computers, that thing you pack three, four learners for computer and they learn nothing
Interviewer	Can the learners (workers) practically apply the knowledge they have acquired from the AET programme in their work environment successfully? Please explain?
Interviewee	Yes, most of them come from outside our country and were not able to speak English now they know. That gentleman can tell you
Interviewer	What intervention mechanisms did the management of this mine make to ensure that integration of computers for teaching and learning takes place?
Interviewee	Hehe, I'm sure the new company will assist in this situation

Interviewer	Is there anything that you would like to add that we have not covered?
Interviewee	There are two examination boards: Independent Examination Board (IEB) and Benchmark Assessment Agency, which is affiliated to Media Works, and learners are allowed to write any of the examinations.
Interviewer	Thanks for your time, Sir. Good bye.
Interviewee	Good bye.

RESPONSES TO APPENDIX H: INTERVIEW QUESTIONS FOR AET LEVEL 3 LEARNERS FOR FULL-TIME

FOCUS GROUP

Date: 2017.04.11

Title: A programme to train adult mine workers with computer based skill in the North- West Province **Date:** 2017.04.11	
Interviewer	Good afternoon class
Interviewee P10	Good afternoon mam
Interviewee P11	Good afternoon mam
Interviewee P13	Ahee
Interviewee P15	Ahee
Interviewer	Are you a permanent employee of the mine or a contractor?
Interviewee P10	I am permanent in my job
Interviewee P11	I am permanent employed
Interviewee P13	I am Permanent
Interviewee P15	Permanent
Interviewer	How did you learn about this AET programme offered at the mine? Were you nominated to attend this class or was it your initiative?
Interviewee P10	I was nominated.

Interviewee P11	I didn't ask much because my supervisor, I just received a message from my supervisor when I was underground. He told me my number is nominated that I'm supposed to come Full-Time at that time; I was attending at Own-Time after work.
Interviewee P13	Before I came here I started at Own Time and then they nominated us to come here
Interviewee P15	I was nominated
Interviewer	How long does it take you to obtain this qualification?
Interviewee P10	6 months.
Interviewee P11	6 months.
Interviewee P13	Ja, the period is 4 months and then next we write exam like now we can we write exam.
Interviewee P15	6 months that depend where you come from.
Interviewer	What motivated you to attend this AET programme and how is it going to benefit you at home and at work?
Interviewee P10	It has changed my life because now it is not like the previous time before I came here because the first time to come here some of the teachers speak English it was difficult to hear him or her but now I saw I was blinded but now I am seeing the light now because I know to speak English to understand to hear someone speak and then I have confidence.
Interviewee P11	Hu-u, I want to have a promotion at work
Interviewee P13	So, I have improved I know to at work I have they keep the papers or rolls but it comes for English the previous I was struggling to understand what the

	company want but now it is better I can read those papers and understand that rules and then go further with my work.
Interviewee P15	I left school at home long time, when I joined the mine I do AET and improve myself to get certificate
Interviewer	Before you attended this AET programme were you able to speak and communicate in English
Interviewee P10	By the time I start level 3 it was better before I came I cannot to come here.
Interviewee P11	Right now, I am speaking English because I learn.
Interviewee P13	Yes, I speak now like before
Interviewee P15	Not much, now I can speak on the phone English, I hear them when they talk
Interviewer	Does the AET programme provide you with basic learning skills, knowledge and attitudes?
Interviewee P10	Yes.
Interviewee P11	No, now I know English because I can advise because I see to I can tell him learn from me because you see me now
Interviewee P13	I can do calculations, I know a prime number, I subtract, I divide in two, three, four u ya bona
Interviewee P15	Everything from counting and reading, ja
Interviewer	How is obtaining this qualification going to assist you at work?
Interviewee P10	When we came here the post were advertised. So, we are going to be apply for those positions.
Interviewee P11	And we qualify to apply after we are finished here.

Interviewee P13	That operation of mine shaft, maybe after 3 months they keep the post but because I didn't have the qualification was difficult to apply that but now I have power to challenge.
Interviewee P15	And education is not only for our children and we adults we care we can learn however old you are.
Interviewer	Were you able to read documents in English before you started with this training?
Interviewee P10	Not much.
Interviewee P11	Yes
Interviewee P13	A little bit
Interviewee P15	Yes
Interviewer	Do you use the computer during this AET programme and does your job require that you use the computer to execute your tasks?
Interviewee P10	We don't know I heard our head it says we didn't have many things on the computer to do and then they want the person who come to set the programs.
Interviewee P11	The computer can assist us it is a good thing because we are now fortunate to be using the computers in life.
Interviewee P13	As I have said that in our operations we are expecting to get promotions but if we don't have the notifications for jobs it will be difficult to use that computer.
Interviewee P15	Yes, at our office there are computers.
Interviewer	Are you able to express yourself, read and write better in English than before you started with this programme?

Interviewee 2	Yes
Interviewee P10	So, I learnt many things in life to achieve another things.
Interviewee P11	Yes
Interviewee P13	Me, the previous times maybe I have I see the space is the white people that time I didn't able to go there to speak with them but now I am challenging.
Interviewee P15	Ja, it is because I study every time to read English papers, magazines.
Interviewer	Do you use the computer for learning at this centre, and if not, why?
Interviewee P10	Not here but at Own-Time I was told about that I was just showed how to enter your name and answering the questions how can you select the correct answers from that computer. And after that after I have finished that assessment no more I have used a computer.
Interviewee P11	Uh-uh, now at on time
Interviewee P13	No, I just do training on time before for assessment only not to study, deeply with computers.
Interviewee P15	We don't know they tell us about the technician delaying the process
Interviewer	What is the difference between learning through face to face and the computer? Which method do you prefer?
Interviewee P10	Computer
Interviewee P11	The computer
Interviewee P13	Computer is good
Interviewee P15	Computer

Interviewer	Are you motivated to use computers for learning?
Interviewee P10	I don't think it will be difficult to us because like we have our cell phones they are designer like computers I don't feel that it would be any challenge about computers.
Interviewee P11	Ja, the computers the way I saw at one time they want to guide you some things but the time you understand the language you can know how come it is because computer speak with you it communicate with you and then you ask the computer a question and you know when to respond or whatever and show you the spellings etcetera.
Interviewee P13	I improve myself first, ehe, then apply for a new job.
Interviewee P15	Yes, computer I like it, I type my CV, I send e-mail, I do numeracy on the computer. I listen to the woman talking give instruction to answer when I was Own-Time
Interviewer	Do you have access to a computer at work?
Interviewee P10	No, we don't have
Interviewee P11	Not now when I finish, when I go back to work they will give me a computer
Interviewee P13	Not here at home
Interviewee P15	Yes, I have it at home
Interviewer	Do you think when using computers for learning you can improve your writing and that typing on the keyboard will help you finish faster?
Interviewee P10	I am not using the computer at Full-Time.
Interviewee P11	Yes you can improve a lot

Interviewee P13	Yes you can improve
Interviewee P15	Yes, you improve a lot
Interviewer	Is it correct that when engaging with computers you do not depend on the facilitator to get information?
Interviewee P10	Yes it is true because you sit there and do exercise, computer tells you if its right or wrong
Interviewee P11	I don't know but ja, it can help you in class
Interviewee P13	For sure ma'am it is true
Interviewee P15	It is the same I can use the computer without assistance because I do have a knowledge.
Interviewer	What motivates you to use a computer?
Interviewee P10	Because I use it at the banks, my phone this one you see, is a computer, I send message at home now now. And here niks
Interviewee P11	I know how to use the computer. You type and you don't have to write everything you type. I say the computer is better because there is a big difference between the communication book and the computer.
Interviewee P13	I just like it, and I buy one at one for children
Interviewee P15	I used the computer in Level 2 Own-Time. Here at Full-Time we don't use computers but they are there in the lab.
Interviewer	Are you able to apply the knowledge and skills that you have acquired from the AET programme at work?

Interviewee P10	Me, I can read and do the maths, you see I write the numbers descending and ascending in the class
Interviewee P11	I am Level 3 for the second time because the time we write the final exam I was on leave so I haven't got the time to come to write the exam. So, right now I am doing the Maths only because I passed the English and will get certificate for AET Level 3. Urh, yes, they will promote me at work when I finished, that's why I do this programme.
Interviewee P13	Ja, I can say that I have been doing better and I don't know how to put it but the most thing is I can read with understanding, you know, that thing that has been on the notice board at work and to me it is easy, you know, because when you are on duty sometimes you are working with measures so it's easy for me to know that when they are talking about 2 m or 3 m how to calculate that without using a what do they call it….measure tape. So, because I know how to calculate these things, ja, AET is really helping me and I do apply what I get from school at work.
Interviewee P15	Yes, I can even teach others
Interviewer	Is there a noticeable change in your performance at work after passing examinations, and if so, what is it?
Interviewee P10	Yes, my performance has changed a lot. At work I don't ask somebody to explain something to me. I read and I write everything for myself and even if there is a query I can solve it. Even my team, if they have some problems, I try to solve it before I take the further steps to the top management or to the head of department. Then, after I solve it then I take or I make the written letter to the head of department to show him I have solved something.
Interviewee P11	Ja, I communicate well with other people in English. I can follow and give orders using English, and to read and write proper with English I think it's another reason to say yes, AET is really a help for my performance.

Interviewee P13	Yes, I can read a notice on the board or an advertisement, something like that
Interviewee P15	Yes, it has improved because I was a leader at work but somewhere I got problems some big challenge but now I have the confidence and I am a profitable leader for my team.
Interviewer	Has this AET programme improved your confidence?
Interviewee P10	The time I walk everywhere in town. I don't ask for the directions anymore, the boards tell me the directions. I read the board and I know how many kilometres to get to my place. I am started to use computer here at Own-Time and I can't use it every day. I work overtime and the cage comes late from underground when the class is finished and I am tired.
Interviewee P11	I am Level 3 for the second time because the time we write the final exam I was on leave so I haven't got the time to come to write the exam. So, right now I am doing the Maths only because I passed the English and will get certificate for AET Level 3. Urh, yes, they will promote me at work when I finished that's why I do this programme.
Interviewee P13	I am able to stand in front of people saying something without fear like before because I was scared when I'm standing in front of people maybe reading newspaper and then I have to demonstrate something like that so it is much better now because I can do those things.
Interviewee P15	At home, also, I can help my children. If I am late from work and I arrive home I am studying my books, he enjoys to come with his books and sit close to me and we discuss something. He likes to speak to me more than his mother because his mother, she is so tempered, she says no. I mean now I have the books but right now I am older at home but I enjoy the books.
Interviewer	How has your life improved since attending the AET programme, and will you recommend the employees to attend AET courses?

Interviewee P10	Yes I can recommend the workers
Interviewee P11	Yes, I can say it has improved my life because now I can do the things that I was not doing like going to the bank, going to withdraw money or deposit or want to speak with somebody else or if I wanted help at the bank I can go and ask for myself without sending another person to translate for me.
Interviewee P13	Yes, I will recommend it to others
Interviewee P15	I can read my payslip and I can see when they've taken more money from my salary or when there is increase, I can calculate the percentage without anybody to help me
Interviewer	Is there anything you want to add that we have not covered?
	It changed my life because I think a lot to come here to AET I know how to communicate with other languages I know how to read and write and I know I speak English fluently now than before. And also in mathematics I know how to work with percentage but before I had not our increases our salary is increased by some certain percentage but I don't know how to calculate them before but now I know how to calculate percentage. It is how it helps me at AET.
	Thank you for your time, good bye
	Good bye Ma'am.

RESPONSE TO APPENDIX H: INTERVIEW QUESTIONS FOR AET LEVEL 3 LEARNERS FOR OWN-TIME

FOCUS GROUP

Date: 2017.04.06

Title: A programme to train adult mine workers with computer based skill in the North- West Province **Date:** 2017.04.11	
Interviewer	Good afternoon class
Interviewee P12	Good afternoon mom
Interviewee P14	Good afternoon mom
Interviewee P16	Good afternoon mam
Interviewee P17	Good afternoon mom
Interviewer	Are you a permanent employee of the mine or a contractor?
Interviewee P12	I am employee of the mine.
Interviewee P14	I am a permanent employee
Interviewee P16	I am a permanent employee
Interviewee P17	I am a permanent employee
Interviewer	How did you learn about this AET programme offered at the mine? Were you nominated to attend this class or was it your initiative?
Interviewee P12	I decided it was my own decision to attend this. I was not nominated.

Interviewee P14	I came here to study Own-Time
Interviewee P16	It's my decision to improve myself not the company
Interviewee P17	Nobody forced me to come here. I am coming myself to study and read to know something can be make my life easy and to continue with my work
Interviewer	How long does it take you to obtain this qualification?
Interviewee P12	6 months' madam.
Interviewee P14	Its 6 months.
Interviewee P16	The thing that took me 6 months is because there are 2 subjects. I passed one, then I failed one. I have to repeat another one.
Interviewee P17	6 months
Interviewer	What motivated you to attend this AET programme and how is it going to benefit you at home and at work?
Interviewee P12	Ja, it's to communicate well with other people in English using English and to read and write proper with English. I think it's another reason to say yes, AET is really a help for me. I think so.
Interviewee P14	Now right now I can open the computer myself and I can put the password and I can do the lesson on the computer until I finish the lessons and then change from the other lesson to another lesson. But, the computer gives me the access only if I pass more than 70% then I can go to the next lesson.
Interviewee P16	Me, I don't know some employees who attended AET got promotion at work.
Interviewee P17	There are some employees who have been attending here but because of the duty and overtime, supervisor does not give them time for ABET

Interviewer	Before you attended this AET programme were you able to speak and communicate in English
Interviewee P12	It was not easy but I was trying because we speak Fanagalo in underground.
Interviewee P14	Not much, but I can't attend because I work overtime and the cage takes a delay for the class, and the teacher can't wait for us
Interviewee P16	Yes, it was a very difficult, or can I say it, it was complicated because the time I was reading the books I was just read without understanding but right now I can understand something if I read in the book and if somebody asks me a question then I have to take time before I can answer because sometimes I was busy with the other things which I don't know what I'm doing but right now, before I can do something I think first and then I can start continuing with the things I do. I make sure that everything I do is right.
Interviewee P17	I was not very bad, I tried a lot and do mistakes at last I can speak English
Interviewer	Does the AET programme provide you with basic learning skills, knowledge and attitudes?
Interviewee P12	Yes, I can read, write and speak English
Interviewee P14	Yes it does, now I communicate better with people at the mine in English, and I like it I speak it always even in the change house
Interviewee P16	I have good writing skills, and talking in English
Interviewee P17	Yes, mam
Interviewer	How is obtaining this qualification going to assist you at work?
Interviewee P12	Just because there is nothing can be easy if you can't learn or if you don't have a school certificate and then it will be difficult to work with a different

	people at work and then to get some promotion or to upgrade something for you it will be better for me.
Interviewee P14	I am becoming a complete person in that I am less and less dependent on other people for my survival. I have achieved something (e.g. AET Level 3 certificate and will be starting with Level 4, there is something coming for promotion at work) and I am living a more hopeful life since I started AET classes.
Interviewee P16	The first one I want to speak English, the second one I want for my whole life and I want to see me next time maybe I want to work at the computer. I want to know the computer. I want to speak English nicely. I want my life is change.
Interviewee P17	It will assist me to get promotion at work
Interviewer	Were you able to read documents in English before you started with this training?
Interviewee P12	Nothing. I was trying but right now I am speaking English because I learn
Interviewee P14	No, I was not. It was not easy but I was trying but now I think I'm better than before I started.
Interviewee P16	Just now I am here. I can read the books. I know the adverb and the adjective and the nouns and the pronouns and the future, many things I learnt here. So, I am happy just now. I want to continue now.
Interviewee P17	Yes, everything we do in English and everything we read and write so, just because I am supervisor at work that is why I want to continue with that levels until I finish because everything I do at work is reading and it is to write and to allocate the materials, everything at work, and every day I use the pre-work so I must write the pre-work and I must write the other documents for the people and for myself also.

Interviewer	Do you use the computer during this AET programme and does your job require that you use the computer to execute your tasks?
Interviewee P12	Yes, we sue the computer , no not my job
Interviewee P14	Yes just for two hours and it is not enough
Interviewee P16	My job does not require computer, at Own-Time here we use computers
Interviewee P17	We use computers
Interviewer	Are you able to express yourself, read and write better in English than before you started with this programme?
Interviewee P12	Yes, right now I use English it is at my job because I'm on the supervisors I was elected supervisor but I'm working permanently on surface for doing the orders and allocate every material going to underground.
Interviewee P14	Yes mam
Interviewee P16	Yes very well
Interviewee P17	I am getting there, but trying
Interviewer	Do you use the computer for learning at this centre, and if not, why?
Interviewee P12	Yes, on the computer I can open the computer and I can put the password and I can start with the first lesson until where I can stop and if something is different, then I can call the facilitator to come and show me something and the computer is the access for everything to me. That's why I want to learn it.
Interviewee P14	Yes mam, we do

Interviewee P16	Yes, may be three time a week because we are many and we share one computer
Interviewee P17	Yes, sometimes we don't go to class we come here only and share the computers to do work
Interviewer	What is the difference between learning through face to face and the computer? Which method do you prefer?
Interviewee P12	There is a lot
Interviewee P14	I like the computer and I enjoy it
Interviewee P16	No I don't like that workbook, you write too much, here we type only
Interviewee P17	I prefer the computer
Interviewer	Are you motivated to use computers for learning?
Interviewee P12	Not too much but here I can. I am not sure. That is all I can say for now. Yes, I can use a computer but I am really not sure about it.
Interviewee P14	Because most things now are being done with computer so I want to know how to use the computer. That is what motivates me.
Interviewee P16	They allow us to use the computer but the very important thing is to read the books and to write and to understand what is the
Interviewee P17	After a couple of days, they take you to the computer to open the lesson who we was busy with the class then you going to be busy with it on the computer that side so they can see if you can operate a computer carefully and the thing we read in the book to see if it is difficult on the computer or it is simple on the computer. So, it's something that will give us a green light
Interviewer	Do you have access to a computer at work?

Interviewee P12	Not yet
Interviewee P14	I think they give me access when I finish school
Interviewee P16	No I don't have it
Interviewee P17	I have but I did not use it I was scared to make mistakes
Interviewer	Do you think when using computers for learning you can improve your writing and that typing on the keyboard will help you finish faster?
Interviewee P12	Yes mam
Interviewee P14	Yes
Interviewee P16	Yes
Interviewee P17	Yes
Interviewer	Is it correct that when engaging with computers you do not depend on the facilitator to get information?
Interviewee P12	I think she wants us to try to teach ourselves. She wants to look at us, how we focus when we are not with her. I think that is the reason. She sent us there to start there on the computer and then come back to the class.
Interviewee P14	Sometimes we need her to assist us
Interviewee P16	The person talking on the computer because it sounds like it's an English person so when we are listening to her, the person, who speaks his/her language must listen attentively especially when you are not clear about it so I think to use the computer almost every day will be more helpful to me. It will improve me much. It will improve me to listen, you know, very careful and teacher can explain what we don't understand

Interviewee P17	She knows it better than us, so we need her
Interviewer	What motivates you to use a computer?
Interviewee P12	I like it
Interviewee P14	My phone has a keyboard, it reminds me of computer it can do everything for me. Same as computer, I type message, I read messages
Interviewee P16	It makes learning not difficult, and makes you to listen
Interviewee P17	It's like now, all things for this book, communication book; I know how to work on the computer. To see the questions at the computer. Computer is nice. I like the computer. I love the computer.
Interviewer	Are you able to apply the knowledge and skills that you have acquired from the AET programme at work?
Interviewee P12	I write my name on the board and sentences. At the banks I can interpret the bank statement, my payslip, read them and I can express myself, I don't need assistance I can read from the board questions and computer and fill the forms. When I have free time I read newspaper and understand what it says. At work I read my shift on time sheet.
Interviewee P14	Our time is not too long. It's only 2 hours and we find that you must start on your class, you know, get some preparations and, you know, maybe it's an hour or less than an hour we are in the computer room so it's not too much time.
Interviewee P16	Yes, I think so.
Interviewee P17	Yes I am able
Interviewer	Is there a noticeable change in your performance at work after passing examinations, and if so, what is it?

Interviewee P12	Yes, it is there
Interviewee P14	Really my performance is it has really changed. It's changed because the management and my supervisors, they like the way I perform at work and the way I control the people at work.
Interviewee P16	I think I have improved a lot at work. I can see the mile from Level 2 until Level 3. I am starting Level 4 next month. I feel good about my work. I am no longer scared or hide behind colleagues because I did not have much knowledge of my job
Interviewee P17	Ja, it really helped because now I can communicate with other people without being nervous or scared of, you know, going to mess up. So, now I think I'm better than before. So, I think.
Interviewer	Has this AET programme improved your confidence?
Interviewee P12	I am a winch operator, I operate machine and I can explain when something is not good at the machine
Interviewee P14	My role at work is to maintain the railways, to maintain the air pipes and water pipes. I speak in English to give instruction and not Fanagolo for the people working with me underground.
Interviewee P16	My job is a PTV. It's called pipes, tracks and salvage. After attending this course I can read safety rules for my crew and explain what they mean and what must they follow.
Interviewee P17	I measure the square. I know if my square is 34 m, I need eish 8.5 m times 8.5 m to blast underground. If somebody he says is 1.5 m but it is 8.5 m it means he doesn't know how to count
Interviewer	How has your life improved since attending the AET programme, and will you recommend the employees to attend AET courses?

Interviewee P12	Just now, I am better than last year.
Interviewee P14	I love it and I really like to, you know, work on computer because I think it makes things easier that's what makes me to love to use it.
Interviewee P16	Yes, it will improve them in many ways because when you are on the computer you need to listen very carefully and I think AET improves Education
Interviewee P17	Ye, they can come and attend to improve lives
Interviewer	Is there anything you want to add that we have not covered?
	I am just starting to, you know, I was just starting to learn about direct and indirect speech so you just found me when I start to learn. So, I don't have any clue about direct and indirect speech for now.
	Thank you for your time, good bye
	Good bye Ma'am.