

DOCTOR OF PHILOSOPHY

A systematic method to develop work-based training for SMEs

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A SYSTEMATIC METHOD TO DEVELOP WORK-BASED TRAINING FOR SMES

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of the University's requirements
for the Degree of Doctor of Philosophy.**

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ABSTRACT

Training plays a key role in bridging employer skills needs and in raising the productivity of employees and individual firms. Many large organisations have long established in-house training programmes and the means for progressive personal development for employees. However, Smaller to Medium sized Enterprises (SMEs) have not mirrored the same. SMEs are less likely to provide off the job training to employees because of operational demands. There is a lack of structured approach to training within a SME. Despite the vast array of training programmes available to SMEs, very little has been done to tailor the training to the specific learning needs of SMEs.

Web Based Training Environment (WeBTiE) is a tailored online training solution specific to a SMEs' training needs. The portal within which online training is provided is the collaborative efforts of the Employer, Employee and Training Vendor. The portal encapsulates not only the learning content, but provides the learning support necessary to guide employees through the training and reinforce work-based practises with the use of a Community of Practice. Unlike many other training models the originality of this model is that it combines Pedagogy principles in the development of the training programme, along with e-learning model, E-tivities for Structured On The Job Training. The generic nature of this model allows it to be adaptable for SMEs in a variety of industries and the tailoristic feature provides the flexibility necessary to permit the adaptability.

This thesis focuses on the barriers SMEs face when attempting to train employees. By determining employee learning and training needs and establishing a 'Learning Foundation', can we move forward with the development of a training programme commissioned for SMEs. The work in this research is underpinned by learning theories and online learning and the application of these (adapted if necessary) in the context of the day-to-day constraints typical of SMEs.

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CHAPTER 1 BACKGROUND

1.1 Introduction

This chapter presents background information to the research topic. It describes the research aims, which will help to deliver a solution to the problem scenario. It sets out the structure of the thesis and the methodologies or approaches that are applied in the execution of the literature review and fieldwork. Also, the chapter sets to introduce the publications the author has produced as a result of fieldwork carried out.

The establishment of the World Wide Web has given birth to a revolution in communication, which has been gathering momentum over the past two decades. These developments have had tremendous implications for human resource functions of training, performance support and performance appraisals (Brown 2001). The World Wide Web is seen as the world's largest resource that has offered new ways of working, conducting business and managing our lives. New learning paradigms have brought about new methods for teaching and learning. It is not difficult to see why government, educationalists and companies are keen to exploit the potential of the Internet and Web based or Online Learning (Stephenson 2001).

During the past four decades, economic and technological forces have transformed the UK economy from production based to a service based economy. Globalisation and technological revolutions mean now an undergraduate degree marks the beginning of a continuing education. There is now no longer a job for life. The new economy places emphasis upon intellectual capital. Lifelong learning may be considered a buzzword but it has also become an imperative. The millennium marked the beginning of organisations viewing learning as a competitive weapon rather than an obstruction to production. Business success and high quality employee performance are closely entwined, which in turn requires high quality timely training.

Skilled and adaptable workforce is an essential ingredient to the UK's business competitiveness, regardless of their size. Training plays a key role in bridging employer skills needs and in raising the productivity of employees and individual firms. This shift in paradigm is one that is recognised by large organisations world-wide, where investment in Human Resources, employee training and development are made. Boud, Solomon and Symes (2001) state that organisations need to be

...committed to making an investment in the learning of its employees and willing to take a longer view than the completion of immediate performance or productivity requirements (2001:9)

Though the skills gap may still be in place, the time and effort taken by corporations investing in their employees is repaid to the organisation, through higher quality production and a higher turnover of staff (Gower 2005). Recognition by large organisations in the benefits of training staff has paved the way to significant investment in Human Resources. Many large organisations have long established in-house training programs and means for progressive personal development for employees. Most workplaces are now not without their PC's and Internet connection, utilising this, organisations have been able to develop online training programmes, where the delivery of the training is both timely and relevant. Comparatively, SMEs (Small to Medium Sized Enterprises) have stumbled in this area. There are many issues impeding the establishment of this for SME employees ranging from time to train to resistance to cultural change.

In 2003, the Confederation of Business Industry (CBI) called for ministers to make training for SMEs more accessible to smaller enterprises to help improve business performance. The CBI reported 79% of SMEs, with five or more employees, provided informal on the job training but training providers should offer tailored solutions, and the government must actively support the development of SMEs (Foster 2003:2).

SMEs are a diverse group which consisting of highly skilled and productive individuals. In 2005, SMEs accounted for over half of the total employment

population in the UK alone. This was also true for the West Midlands (BERR 2006b). SMEs

...form the backbone of the UK economy [they are] are dynamic fast-moving businesses. They are turned off by public sector bureaucracy, but do need flexible support to further develop their business and employees... (Foster 2003:1)

Many of the SMEs operate at an operational level (functionality which is concerned with the day to day activities). Training conducted is done so on an informal and ad-hoc manner. The process of recording and monitoring the training undertaken is almost non-existent in many cases. However, exceptions to this are with SMEs who comply with ISO9000 or Investor in People. There are essentially four key areas where problems in training SME employees lies. Firstly, many SMEs do not understand what training is required by their employees. Secondly, the culture of a SME does not allow for training to take place. Thirdly, qualitative information and support for employers in finding suitable training is not always readily available and lastly, they work at an operational level means the SME does not look forward to which direction they wish to take the company, therefore, which direction to take employees to fulfil the aims of the company.

Training needs and opportunities within a SME differ greatly in comparison to larger organisations that have the resources to provide formal training. SMEs are less likely to provide off the job training to employees. It is because of these reasons that the government is setting more focus and frequent new initiatives to encourage SMEs to train. There is a lack of structured approach to training within a SME. Despite the vast array of training programmes available to SMEs, very little has been done to tailor the training to the specific learning needs of SMEs.

This thesis focuses on the barriers SMEs face when it comes to training and employee development. By determining employee learning and training needs can we move forward to the development of a training programme commissioned for SMEs. The issue being addressed in this thesis is not what training should be offered to SME, moreover, how training can be tailored to SME, who generally

operate at an operational level and bearing in mind the resources that are available to SMEs.

1.2 Aim

The main aim of this thesis is

the development of a method based on generic guidelines which address the barriers SMEs face in training by facilitating the integration and application of new educational technology in the workplace.

This will involve the integration of educational technology, work-based training practices and learning needs of SMEs for an online training system. The work is underpinned by learning theories and online learning and the application of these (adapted if necessary) in the context of the day to day constraints typical of SMEs.

Novelty concerns the fact that through the growth of networking many new services and possibilities are available for online learning. Little attention has been paid to how SMEs can take the best advantage of this new environment. The innovative aspect will be the application of current training practises alongside, Pedagogic and Andragogic principles to the development of future training schemes delivered online.

1.3 Objectives

The objectives are to:

- establish understanding of the training provisions available to SMEs and why they are not presenting the same level of training uptake as larger businesses in the Coventry;
- establish understanding of the training and learning requirements of SMEs in the Coventry and Warwickshire area;
- provide a critical literature review of Pedagogic principles, applicable in training and learning;

- assess the use of e-learning in training and the suitability of associated models with a view to derive a suitable model for use in SME training;
- develop an online training programme, collaboratively, delivering pre-determined training requirements;
- evaluate, using appropriate techniques, the effectiveness of training undertaken by SMEs;
- utilise empirical work and literature to bring together and develop a set of generic guidelines to deliver work-based online training for SMEs;
- expose the finalised guidelines for critique and use the evaluation to make appropriate modifications for the final version.

1.4 Structure Of The Thesis

The thesis is essentially in three parts. Firstly, the theoretical work already established which underpins the thesis. The theoretical work relates to teaching and learning approaches both in and outside the classroom. The second part details the three sets of fieldwork carried out with SMEs to determine the training provision in existence, the results of training needs analysis, and results of the development and delivery of a training programme for SMEs. Finally, the third part detailing the findings of this work accumulating the guidelines derived, evaluation and then the modified version of the training model, can be found in the latter of the thesis.

Chapter one illustrates an overview of the thesis. It details the aims and objectives that once achieved will bring success to this research.

Chapter two details the research approach and design that will ultimately deliver the generic guidelines.

Chapter three concentrates on SMEs background. It looks at who are SMEs in the United Kingdom (UK), West Midlands and Coventry and Warwickshire. It illustrates the importance of SMEs to the UK economy and selects a group of SMEs with whom this research is based.

Chapter four reviews training provision available to SMEs in the Coventry and Warwickshire area. It focuses on what are SMEs current skills level, current training provision and their associated problems and finally generating a specific subject area of training to use to build a training programme around.

Chapter five puts E-learning or Online Learning into perspective. What is E-learning or Online learning? What are the instructional design implications? This chapter attempts to differentiate between traditional methods of training and e-learning and brings together a teaching approach specifically for SMEs.

Chapter six focuses upon learning theories. By classifying the numerous learning theories there are, can we focus on the theories that might be most relevant to training SMEs. This chapter brings together learning theories within the folds of three categories: Behaviourism; Cognition and Constructivism. The chapter also sets out generic guidelines within the aforementioned categories that are to be utilised within the final framework.

Chapter seven is a detailed account of the empirical research carried out in collaboration with ProEnviro and CW2000. The chapter details an understanding of training needs analysis of SMEs and it discusses the development and execution of training for a test group of SMEs. Finally, it explores the approach taken and lessons learnt.

Chapter eight brings together all findings from previous chapters and delivers final model and the generic guidelines for SMEs to adhere to when training is being considered. In the latter part of this chapter, we have details of the results of exposing the initial model to critique and changes to the model design.

1.5 Dissemination Of Results

Throughout the lifetime of this research, a number of publications have been disseminated to the specialist research community. Five reviewed conference papers have been published. [Samra 2000, 2001a, 2001b, Samra *et al.*, 2002 and Samra *et al.* 2008]. Two of which, were published in internal proceedings at

Coventry University [Samra 2000, 2001a]. One paper was published to a wider audience through a journal [Samra *et al.* 2004].

CHAPTER 2 RESEARCH APPROACH

2.1 Introduction

This chapter is a general discussion of the research design, philosophy, research methodology and research methods for data collection and its relationship to the aims and objectives of the research. This chapter describes the research methodologies used to develop and validate a normative model to enable SMEs to undertake web based training in-house.

The aim of this chapter is to justify the research design in relation to the objectives of this research. During the course of the research, the research design evolved, as learning and understanding developed. The use of qualitative research, based upon literature, interviews, questionnaires and observations was utilised along with two perspectives, Action Research and a Software Development Approach to develop WeBTiE. The research drew on insight from fieldwork, observations and interviews to refine the model further to ensure its relevance to SMEs.

The chapter illustrates the methodology used to deliver the final model, entitled Web Based Training Environment (WeBTiE) and the approach used to evaluate and verify findings by removing the presence of subjectivity. .

2.2 Research Overview

This chapter aims to put forth the view of the entire research process proposed for the achievement of the aim and objectives stated in the previous chapter. According to Saunders, Lewis and Thornhill (2007) research design provides an overall view of the method selected and the reason for that choice. In essence it details an action plan to aid the researcher execute the research from its inception to its conclusion. It does this by providing the researcher with initial questions to be addressed.

Figure 1 below provides a top down view of the four phases of the Research Process. The four-phase segregation: Research Process; Research Philosophy; Methodologies and Data Collection, collectively helps to provide a better understanding of the research design.

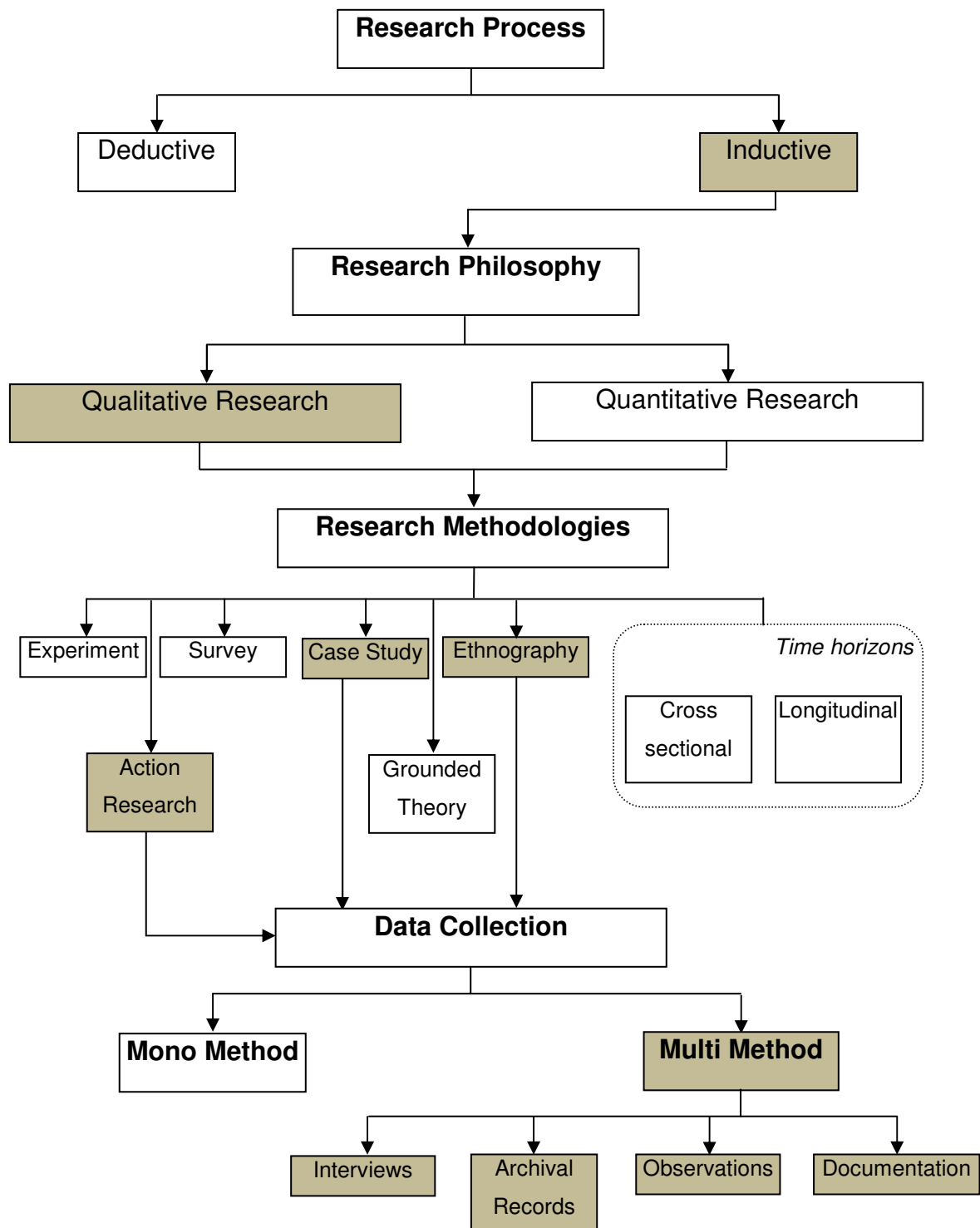


Figure 1: Research Overview

The figure above has been adapted from Saunders, Lewis and Thornhill's Research Onion (2007:102). It provides an overview of the four phases of the research process that collectively allow for the execution of the research. Each phase has a number of boxes, which illustrates a process. The shaded boxes highlight the process used for this research. The reasons for selecting these particular processes and their relevance to this research will be discussed in detail later in this chapter.

2.2.1 Research Process

The aim of this research is to develop a systematic method whereby an adaptive model can be built, to enable SMEs develop an in house training programme. An Inductive Process, which owes to interpretivism, would allow for the formulation of a model, thus supporting the data collected rather than to vice versa (Saunders, Lewis & Thornhill 2007). Inductive approach is subjective in nature and as such, it is important to verify the reliability and validity of the research through Triangulation. To develop a relevant model, it is important to view, understand and correctly interpret findings related to how SMEs operate, their constraints, resources and culture. Developing such an understanding is considered a strength of an inductive approach (ibid:118).

This research is concerned with a particular context, SMEs, and therefore, a study (collection of qualitative data) related to a sample of SMEs would be appropriate in comparison to a large number as with the deductive approach. The study of two groups of SMEs would aid in the development of a 'Preliminary Design' and 'Post Collaboration Model' and further to validate the 'Final Model and Generic Guidelines' (see chapter seven for further details of empirical research) to ensure reliability.

2.2.2 Research Philosophy

As implied in the previous section an emphasis of induction is the use of qualitative data as opposed to quantitative data. An assumption made by Induction is an impression that the available theories could be inaccurate,

inappropriate, incorrect or biased'. Training models at present tend to specific to larger businesses with formal structures and available resources for training. With the absence of both factors and the added issue of operational demands, raises the question 'How do SMEs incorporate training?'. The absence of appropriate training models for SMEs leads to the use of a Qualitative Philosophy, as the emphasis is upon build a model not to test a particular hypothesis(s), thus providing or disproving a theory.

This research is related specifically to SMEs and as such the empirical research (as detailed in chapter seven) is concerned with natural settings and where human behaviour and events occur (Creswell 1994). Understanding in this setting will provide a wider understanding of the context with consideration for processes and variables that may not have been determined from the onset, as well as the product or outcome, but nonetheless are realised and incorporated in the development of a training model. In qualitative research, hypotheses are not established beforehand (ibid). It is important for this research not to pre-empt the design of the model. The research design needs to substantiate the development of the training model by the data collected. Emphasis of research is not concerned with testing a hypothesis but to generate a model that is validated by data collected.

The nature of the data collect needs to, in part, focus upon SMEs perceptions and experiences, and the way they understand their working environment (tacit knowledge) as this provides the research a rich insight into the reality of business and training and by correlating with findings from a literature review, builds a holistic picture.

2.2.3 Research Methodology

It would not be fair to suggest that this research has taken and applied Case Study, Ethnography and Action Research in its complete context into this research. The above methodologies have been adapted for this research and rather than use in their entirety have been brought together at different stages in this research.

2.2.3.1 Ethnography

Ethnography is an approach used to,

...explain the social world the research subject inhabits [,it] takes place over an extended time period as the researcher needs to immerse herself or himself in the social world being researched as completely as possible....[The methodology is appropriate] if you wish to gain insight about a particular context and better understand and interpret it from the perspective(s) of those involved (Saunders, Lewis & Thornhill 2007:142)

For the purpose of this research, findings from a literature review were put into context to determine to what extent they portray the reality. A number of questions were at the forefront of this research prior to any empirical research and literature review. These questions were:

- (a) Do SMEs training?
- (b) How do SMEs train?
- (c) Why do SMEs train?
- (d) What are the areas of training?
- (e) What is the provision and availability of training for SMEs?
- (f) What are the views and perspectives of training for SMEs?
- (g) What are the hindrances (if any) to training for SMEs?

The complex nature of these questions, were in part, answered through a literature review, but to fully answer these questions within a context, a depth in understanding was required of SMEs and their environment. During the ethnographic research study, observations were carried out in specific contexts. The objective was to identify the multiple levels of reality experienced by the SME and to portray these experiences in understanding how they address the above questions.

The application of ethnography in this research can be found detailed in chapter seven and the work carried out at ProEnviro. Observations carried out over a year provided a valuable insight into the changing way SMEs in the local area were

undertaking training. The cultural change and change in business functionality observed, demonstrated the relevance of ethnography to this research. Findings from the observations with ProEnviro led to the development of the Preliminary Design. The Preliminary Design brought together not only findings from the observations but findings from the literature review reinforced the observations. The Preliminary Design at this stage, should be considered as a working model, which through a process of analysis, testing, evaluation and refinement would lead to the Final design.

2.2.3.2 Case Study

A case study is an extensive examination of a particular phenomenon of interest within its real life context using multiple sources of evidence (Saunders, Lewis & Thornhill 2007). The aim is to “gain a rich understanding of the context of the research and the processes being enacted” (ibid.:139). The use of this methodology, does in part, generate answers to the questions detailed in section 2.2.3.1. As is the nature of this research the use of a case study is seen in explanatory and exploratory research.

As discussed in the previous section in order to move from a preliminary training model a finalised model, a reflected practice needs to be applied. The use of a case study approach would enable the more exploratory questions of this research, which ask “what”, to be answered through a more informed understanding.

Following on from the work carried out ProEnviro, this research moved to work with CW2000. The use of a sample of SMEs enabled the development of a training programme. The development of the training programme put into place the Preliminary design, developed from findings gleaned from initial empirical research. The focus within the case study was to enhance understanding of processes (training events) and the implications of those processes to the SME. Detailed discussion of the second stage of the empirical research can be found in chapter seven.

As a consequent of using a case study there is a likely need to triangulate multiple sources of data (ibid). The multiple method combination is likely to include for example interviews, observations, documentary analysis or questionnaires (ibid). A combination of interviews (formal and informal), observations and questionnaires were used as part of data collection (further details of results can be found in chapter seven). The use of multiple sources within one study went towards ensuring that understanding of data is explicit and confirmed through more than one source, thus providing reliability of data. The refinement of the training model once the training programme was complete needed to be validated outside the SME remit. As discussed in earlier multiple sources were utilised to ensure the interpretation of data in this research was reliable.

2.2.3.3 Action Research

Action Research (AR) focuses upon research in action rather than research about action. The focus to bring about change with the collaboration of researchers and practitioners alike, therefore, change is made together with those who experience the issues directly. AR emphasises the iterative nature of the process of reflecting or diagnosing a problem, planning a strategy of change, taking action and evaluating (McNiff 2002). As stated earlier in this chapter not all research methodologies have been used in their entirety. AR is similar to the case study approach, in that it is carried out in a particular organisation, but a clear distinction is, AR seeks to change and to monitor the results. The iterative nature of AR is seen as very important to this research. The refinement of the training model and changes made need to be validated through observation. Using the iterative process, refinement of the training model can take place. Changes when highlighted can be actioned and the effects of change, once evaluated for effectiveness, implemented permanently into the model.

To achieve the aim set out in section 1.2., there are five main components to explore. They are: the Current Climate for SMEs; Training and Learning needs of SMEs; Learning and Teaching theories; Training Approaches and Instructional

Design and Educational Technology. These components lead to the development of the guidelines. The iterative process of AR applied during the second stage of the empirical research (case study) allowed for continuous reflection and evaluation and the implementation of changes that are relevant.

Evidence of reflection can be found throughout this thesis. However, the use of this process within the fieldwork is prevalent throughout the second stage. Systematic reviews of experiences (e.g. semi-structured interviews) and feedback from questionnaires went towards highlighting problem areas and suggestions for change. These findings were channelled into the iterative process and changes made re-evaluated when the next group of SMEs undertook training. Findings from this process can be found in chapter seven.

Figure 2 below illustrates the iterative nature of this process.

Figure 2: Iterative Process Of Guideline Development (McNiff 1993:66)

It is important to note that AR's iterative process has been utilised and not the entire methodology. The term 'iterative process' is used to mean a repetition of the same task. This term is notably used in conjunction with 'Reflective Practice' to mean continuously reviewing effectiveness of a process or process change. At the end of each chapter, reflections upon findings from each chapter are brought together to highlight the inclusions of process elements to the training model.

The figure above illustrates the approach taken when reflecting upon the process or area of change. It is an iterative process, where each iteration results in the

refinement of the model. The movement between Strategy, Action and Evaluation leads to refining elements of the training model, which once implemented are exposed further reflections until they are no longer seen to require change.

2.2.4 Data Collection

As highlighted in Figure 1, a Multiple Method data collection is used in this research. This ranges from Interviews to Documentation. Justification of each method used and how it is used shall be discussed in-depth in the section, Methodology, at the beginning of each chapter.

Table 1: Data Collection **Methods**, illustrates what data collection methods were used for within chapter.

Table 1: Data Collection Methods

Component	Research Approach
Current Climate for SMEs Chapter 3	Archival – based on historical records and current public documents Action Research – Reflecting upon findings and establishing understanding
Work Based training Chapter 4	Qualitative research – review of training available to SMEs Action Research – Reflecting upon findings and establishing understanding
E-Learning Chapter 5	Qualitative research - literature review Action Research – Reflecting upon findings and establishing understanding
Learning Theories Chapter 6	Qualitative research - literature review Action Research – Reflecting upon findings and establishing understanding
Empirical Research Chapter 7	Ethnography/Case Study - Interviews, Observations and Questionnaires Action Research – Reflecting upon findings and establishing understanding
Final Model Chapter 8	Triangulation of final model Action Research – Reflecting upon findings and establishing understanding

An important aspect of the data collection methods, is its use in Triangulating findings and in particular the final design of the training model. Triangulation shall be discussed later in detail in this chapter.

2.3 Research Design

In order to achieve the aim of this research and to bring to together the processes from Figure 1 an action plan is required, which sets out the methods to utilise to

investigate, analyse and to deduce areas relevant to allow for the successful development of WeBTiE.

Figure 3 provides an overview of the Research Design components. It demonstrates the different aspects central to the development of the generic guidelines and the model itself.

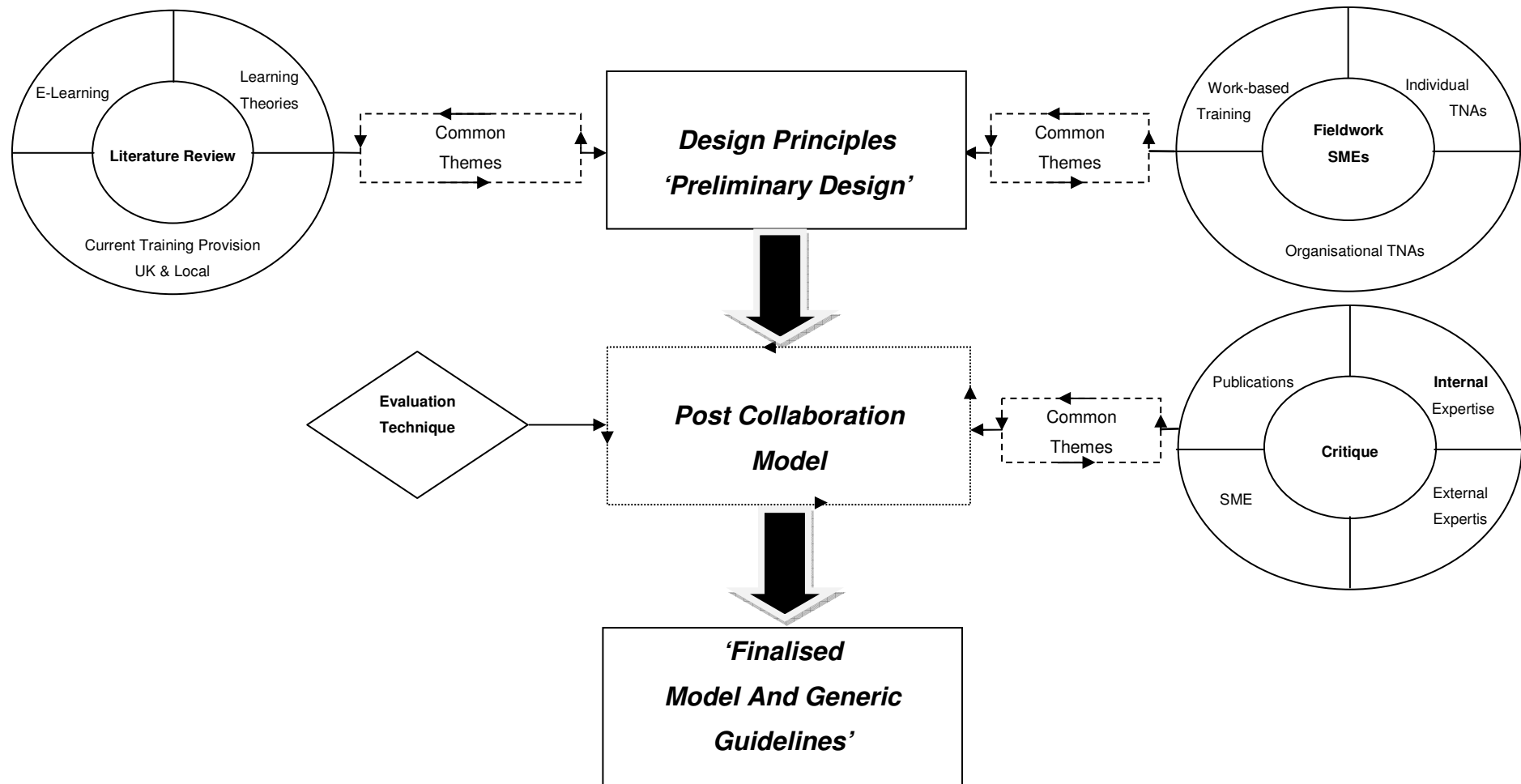


Figure 3: Research Design

There are three key stages in the development of the WeBTiE. The first results in the development of the ‘Preliminary Design’. The second phase Collaboration Model’) results in the first version of the model and generic guidelines. This was exposed for critique and the findings, once emerging were identified, were used to finalise the model and guidelines, to deliver the phase, model design and Finalised Generic Guidelines. There is a strong relationship between Figure 1 (Research Process) and (Research Design)

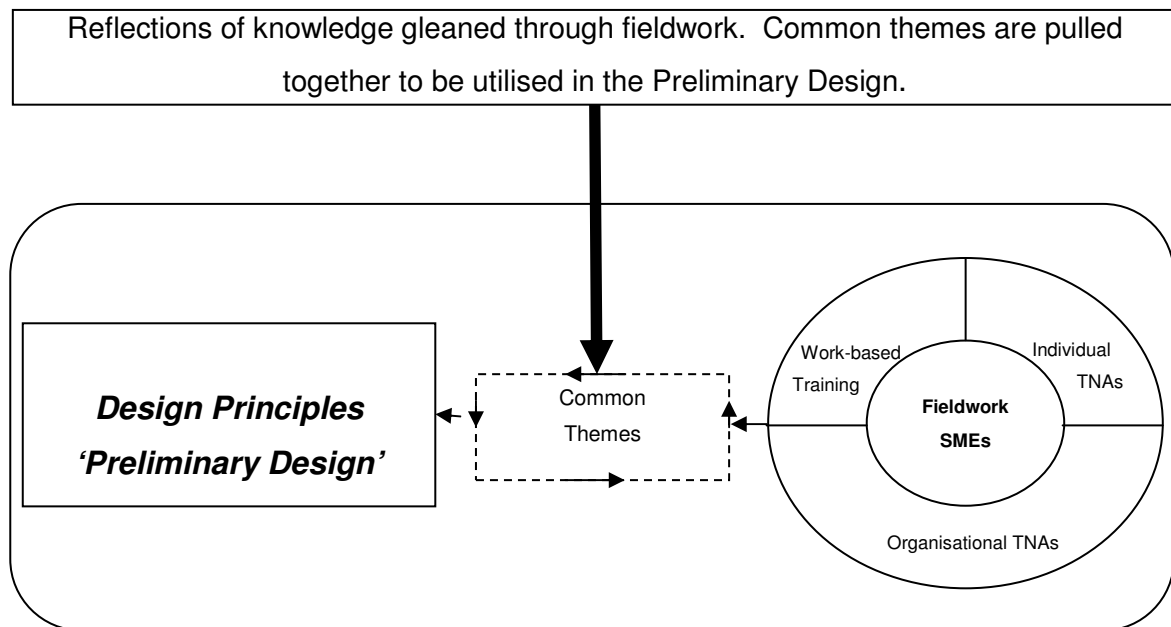
Figure 3, however, from the onset this is rather vague and implicit. To better understand this relationship and to justify the research design’s process, philosophy, methodology and data collection methods and how they works towards achieving the aim and objectives of this research, it is important to look at each phase and discuss how it maps onto the Research Design and relate it to the subsequent chapter (s) of this thesis.

Each chapter of this thesis contains a section following the introduction that details the research approach taken for that chapter. The ‘Methodology’ section is vital to understand how the research design was applied the research detailed each chapter. Closely associated with the Methodology section is ‘Reflections’.

2.3.1 Reflections

One of the underlining principles in the research design that operates to bring forth knowledge from information collated is Reflections. As you can see is from

Figure 3, the Literature Review, Fieldwork and Critique information moves through a process, which iterates.



The extract above highlights an instance of where findings are triangulated to identify common themes that are drawn together when building the training model.

Each chapter contains a section entitled 'Reflections', whose significance brings together findings pertained within each chapter and demonstrates the incremental development of WeBTiE. Reflections can be mapped against the Research Design, as it highlights the development of the three main phases of WeBTiE.

2.3.2 Research Deliverables

As stated earlier there are three main phases in the development of WeBTiE. They are Preliminary Design, Post Collaboration Model and Finalised Model and Generic Guidelines. The development of the Finalised Model is perhaps better understood, when the components are considered. The previous two phases build a picture of the development process of the training model. Chapter 6 contains details of what is the Preliminary Design and how it works. It discusses

the reasoning behind why it has taken the form it has through justification provided from the literature review.

Chapter 8 delivers the Post Collaboration Model. The model design at this stage has been refined through its use in the Cawskills project. The chapter provides a detailed account of how the model works and how it should be used by SMEs to deliver in-house training. The important distinction between the two model design is the Post Collaboration Model is further refined through its use in the primary and secondary stages of the empirical research

The final phase, Finalised Model and Generic Guidelines is a normative model that has been validated by triangulating the information used to build it. A normative model is prescriptive in nature as it seeks to evaluate alternative solutions to answers and suggests what could be done or how things should work according to an assumption or standard. Unlike a descriptive model, which describes the solution without evaluating them. The process of Triangulation helped reduce subjectivity in the interpretation of findings, thus delivering a more reliable and valid model. Chapter 9 details the process of triangulation, the common themes from the process and the effect made on the model. It then presents the final model and discusses how the changes have affected the way in which the model works and is to be used.

2.4 Triangulation

Triangulation refers to “the use of different data collection techniques within one study in order to ensure that the data are telling you what you think they are telling you” (Saunders, Lewis & Thornhill 2007:139). As discussed in section 2.2 an Inductive approach has been used for this research. Induction is subjective in nature and as such it is important to verify the reliability and validity of the findings through Triangulation.

A Multiple Method Approach was used for this research. The advantage is it enables Triangulation to take place (ibid.:147). There are essentially four types of

methods of Triangulation outlined by Saunders, Lewis and Thornhill (2007). They are

- Data – data derive from literature review;
- Method – mono or multiple method;
- Investigator - requires different researchers interpreting the same information to avoid personal bias;
- Theoretical – the use of different perspectives such as to interpret the same data.

The triangulation methods used in this research are Data, Method and Investigator. It is intended that by bringing together these three perspectives, conclusions drawn would help to further refine the training model and reduce subjectivity in the interpretation of findings, thus delivering a more reliable and valid model. The data of triangulations results can be found later in this thesis in section 8.5.

Knowledge derived from the data collected within the literature review incorporated in the training model design, are summarised at the end of each chapter. The incremental development of the training model and its evaluation during fieldwork exposed the model to critique from employers, employees and fellow practitioners. The feedback from systematic evaluation provided an avenue, whereby, refinements to the model could be made. This form of validation provided the first step in triangulating the training model. The results of the evaluation from fieldwork evaluations can be found in chapter seven.

Once the Final Design had been completed the initial step was to validate the design. As highlighted in Figure 1, Multiple Method selected for data collection, use multi methods or multi sources, which are independent to the study, are used to verified conclusions made. This involved semi-structured interviews and meetings with internal and external experts in training, two sample questionnaires aimed at employees post training and employers post training.

The final element of the triangulation, Investigator, led to the publication of WeBTiE, in conference proceedings along with a presentation to academics and training companies. The conference provided an opportunity to expose the model and its processes to critique from experts within the field of training. Their interpretation of findings and view of my understanding and model design would provide the closure to the evaluation loop of this research. The evaluation process resulted in the identification of a number of commonalities and emerging themes. These themes were used to make the final modifications to the model and generic guidelines. The results of the common themes and modification made can be found in chapter 8.

2.5 Conclusion

This chapter detailed the Research Process and Design. Action Research permitted the reflective practice necessary to refine the design of the model and guidelines. The incremental stages of the guidelines looped through Action, Evaluation, Reflection and Strategy. The research design shows three phases in the development of the training model.

Phase one identifies the initial ideas and formulation of preliminary objectives to initial data collection. It seeks to establish an understanding of how adults learn, how employees can train and learn, with an appreciation of technology used to facilitate online learning and extract through reflection, criteria to optimise learning online. Phase two establishes an understanding what are the training and learning requirements of the employee and SMEs and how these are facilitated in a Learning organisation. The result of which is the application and testing through empirical work of the Preliminary Model and guidelines. Analysis of data collated and evaluation of training, leads to design modification. The development of the CW2000 training project and post evaluation delivers the Post Collaboration Model. Phase three exposes the Post Collaboration model and Generic Guidelines for critical evaluation outside the CW2000 project scope to ensure it is applicable for all SMEs, valid and reliable. The final result detailed in the Research Design is a Finalised Model and Generic Guidelines.

The following chapter establishes an understanding of who are SMEs, how they fit into the United Kingdom economy. The importance of the next chapter is it outlines manufacturing's role in the West Midlands and because of globalisation and growth of competition, it is vital they build and sustain a 'knowledge workforce'. This is the first step of the Research Design.

CHAPTER 3 CURRENT CLIMATE FOR SMES

3.1 Introduction

The previous chapter detailed the approaches taken to explore and investigate components comprising this research. As stated in section 2.2.4., Archival and Multiple Source Secondary Data is used as the research approach for this chapter. The approach relies on historical records and current public documents, the analysis of which has allowed the formulation of SMEs profile in the UK, West Midlands and more specifically Coventry and Warwickshire.

This chapter centres upon a number of SMEs in the West Midlands and more specifically Coventry and Warwickshire. It breaks down statistically the industries and their contribution to the economy in terms of employment and Gross Domestic Product. It puts into context who or what SMEs are and how important they are to the economy locally and nationally and the level of employment they make up. From this chapter a specific SME group is drawn to be the focus for training. The SME group form the basis of empirical research, which is detailed in chapter seven.

3.2 Methodology

The previous chapter provided details of the research methodology that shall be used to execute this research. The model extract below (Figure 4) has been taken from section 2.3 (

Figure 3).

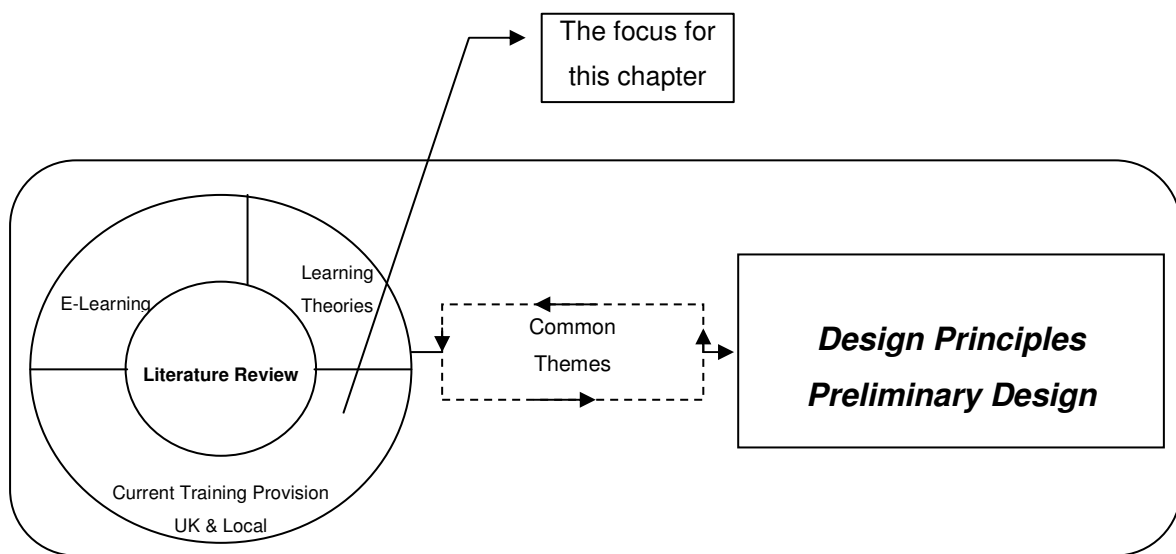


Figure 4: Chapter 3, Research Design

The first stage of the model is the development of Design Principles and Preliminary Design. This stage requires an in-depth understanding of E-learning, Learning Theories and Current Training Provision UK and Local. This chapter aims to establish an understanding of what and who are SMEs and the current training provision available publicly, both locally and nationally. The research approach taken in this chapter is a combination of Archival Research Approach and multiple source Secondary data. The reason for using these approaches in this chapter is to develop an understanding of what changes have taken place over the years that have shaped today's SME. The nature of the information required, is in part, based upon historical data available from sources such as the National Statistics office. However, complete reliance on this source would inevitably be constrained by the nature of the administrative records and

documents. The use of multiple source Secondary Data combined with Archival Research will enable a greater understanding and reasoning of the patterns of change over time and their implications for the future.

The findings from the research focused upon in this chapter will be evaluated through reflection to determine which are the common issues that should be considered as part of the preliminary design for training. The 'Common Theme' is a process of reflection that aims to draw together those elements deemed necessary in the training model design. Section 3.10 or Reflections, documents the elements of this chapter, which are considered vital in shaping the training.

3.3 Small To Medium Businesses (SMEs) In The UK

The Department of Trade and Industry states a Small to Medium Enterprise (SME) as a business with fewer than 250 employees, with a turnover of not more than £22.8 million net and a balance sheet total of not more than £11.4 million (BERR *n.d*). In 2007 there were just over 1.2 million SMEs in the UK within industries ranging from Financial Intermediation to Construction (BERR 2007), accounting for more than half (58.9%) of the total employment in the UK (BERR 2006). This clearly emphasises that the UK has a tremendous dependency on SMEs. The balance between manufacturing and service based companies clearly favours manufacturing at the moment. However, during the past few years there has been a shift in balance to service based companies (Khan, Bali & Wickramasinghe 2007). Over the past five years there has been a steady reduction in the number of people employed in Manufacturing and Construction and an increase in the service based sectors like Financial Intermediation. This reinforces the trend in movement from a labour intensive and manufacturing based economy to a service based one.

3.4 The West Midlands

The West Midlands area is the most densely populated outside London. There are just under 5.4 million people living in the West Midlands (Census 2002). In 2005, there were 353,400 businesses recorded within the private sector of the West

Midlands, increasing by 12.1% since 2003. Of that, 28.8% were SMEs. There are just under two million people in employment (within the private sector) in the West Midlands, 43.4% of which are working for SMEs (BERR 2006).

Table 2: Percentage Employment In Industry In The West Midlands in 2005

Source: BERR (2006)

Manufacturing has been one of the key employment sectors in the region (as illustrated in Table 2) during the last ten years. According to Advantage West Midlands, by 2015 the West Midlands is expected to contribute 20% to the Gross Value Added (GVA) the highest of any region. However, in the last five years this has seen a general decline¹, this will be explored in detail in section 3.5. Employment in manufacturing is likely to continue to fall by 10.7% by 2015 (Advantage West Midlands 2004). The regions reliance on manufacturing has resulted in some difficulties for the regional and local economies as a result of the

¹ This decline has been attributed to by two major car factory closures in the past two years. Firstly the Land Rover factory in Longbridge, resulting in over 6000 job losses and secondly the closure of the Peugeot Ryton factory resulting in 2500 job losses (Boggan, 2006; Government Office For The West Midlands 2006).

effect of increasing global competition on many of the region's manufacturing companies.

3.5 Coventry And Warwickshire SMEs

There are just over 838,000 people living Coventry and Warwickshire (National Statistics 2007c). The most recent Annual Population Survey records that Coventry and Warwickshire has around 402,300 people working in (National Statistics 2006) some 25,910 employing establishments (National Statistics 2005). Table 3 shows the different types of Industries in the Coventry and Warwickshire area and the approximate percentage of employment for each industry.

Table 3: SMEs In Coventry And Warwickshire In 2005-2006

Industry Sector	Businesses	% Employment
Agriculture; Forestry and fishing	1,425	0.92
Mining and quarrying; Electricity, gas and water supply	15	1.69
Manufacturing	2,515	17.65
Construction	2,625	6.81
Distribution, Hotels and restaurants	7,200	17.28
Transport, storage and communication	1,200	8.03
Financial intermediation	190	14.54
Real Estate, renting and business activities	8,345	4.87
Public administration; Education and health	2,395	27.94

Source: (National Statistics 2005; National Statistics 2006)

Business services have the greatest gains in employment while Manufacturing and Construction bears the greatest loss with declining number of people employed over the past few years. It is important to note that with the decreasing employment numbers in manufacturing, it is essential to ensure that the people employed in this industry are able to seek employment in other industrial sectors. To achieve this, SMEs require a skills set that is transferable to other jobs and industry sectors, the reasons for this will be explored later in this thesis.

3.6 Manufacturing

Manufacturing consists of six main areas: engineering; electrical and optical equipment, foodstuffs; chemicals; basic and fabricated metal products; and mechanical engineering (BERR 2007). Automotive, which is part of mechanical engineering is a pivotal part of the UK manufacturing industry. The economic importance of sustaining manufacturing not only in the West Midlands but in Europe is evident from the sheer number of people employed (34 million in Europe in 2006 (Flegel 2006:8)) in the industry and UKs GDP (Gross Domestic Product) contribution. The UK's GDP (110.3 chained volume index)² reduced in the last quarter by 1.5% which in part was a result of output volume decrease of 4.6% in Manufacturing in 2008 (National Statistics 2008). The general decline in the number of people employed in Manufacturing not only in the UK but in Europe too further illustrates the economy's movement towards a service/knowledge based industry.

Manufacturing faces intense and growing competition not only nationally but globally (Khan, Bali & Wickramasinghe 2007). Countries like India and China provide three key advantages: low cost labour scientific and technological resource, and entrepreneurial talent. They have been rapidly modernising their production methods and enhancing their technological capabilities. This in turn has had an adverse affect on the manufacturing industry in the UK and particularly within the West Midlands. On the other hand USA and Japan who have well established and thriving manufacturing industry and are now responding to competition by focussing on technology based products and services. UK manufacturing weaknesses have only been accentuated by globalisation, "the efficient and effective management of knowledge may help organisations gain and retain competitive edge" (Lehaney *et al.* 2004:6). Flegel (2006) suggests that manufacturing facilitate a transition from traditional economy where the focus is on land, labour and capital to knowledge-based economy where emphasis is placed

² Accumulated measure that includes output or production approach, total income approach and expenditure approach.

on knowledge, reliable networks and capital (ibid.:10). However, this process needs not only to be timely but an education infrastructure needs to be in place. A knowledge-based economy requires a “restructuring of education and training to reflect lifelong learning needs of tomorrow’s knowledge workers” who need to see variety as an opportunity (ibid.:21).

Employers' perceptions of Coventry and Warwickshire as a business location have remained unchanged during the past year. The West Midlands is considered as the heart of the manufacturing industry. The manufacturing industry as a whole, accounts for about 23.5% of employment in the UK (BERR 2006). Like the West Midlands region, Coventry and Warwickshire’s manufacturing industry has also seen a decline in the past ten years. According to Flegel (2006:13) the reasons for this are attributed by:

- globalisation - an expanding developing world with emerging economies;
- rapid changes in technology and business procedures;
- inadequate managers and/or restrictive labour practices;
- socio-economic environment;
- lack of skills labour but hidden employment;
- poor rates of return on capital employed.

UK manufacturing firms have experienced healthy trading and growth in the early part of the 21st century, translating to better prospects for investment and employment. However, since 2006 the global credit crisis has had a profound impact upon manufacturing not only in the Midlands (The Stationary Office 2007), but globally. The West Midlands is home to some of the most well established manufacturing companies in the whole. For example, Peugeot, Rover, Jaguar, Land Rover, Cadbury Schweppes, JCB, Wedgwood, Fujitsu, Vodaphone and Muller, but to name a few. However, a number of businesses have either closed its door or have relocated out of the West Midlands. They include:

- collapse of Marconi;
- relocation of Agco-Massey Ferguson to Beauvais;
- closure of Browns Lane – Jaguar;

- collapse of Rover Longbridge;
- and possibly the Jaguar plant in Castle Bromwich and Land Rover in Solihull.

This shift has come about because of the ever changing climate of the manufacturing industry. There is a high level of dependency upon such businesses by SMEs for their own business success.

Sections 3.7 and 3.8 look at two companies based in the West Midlands, which have closed down its production plants. It looks at the implications upon the local economy and the people who were once employed. Though these are large companies within manufacturing, the focus is upon how their closure has affected employments levels and SMEs that depend upon them for their own business survival.

3.7 Peugeot – Ryton

In April 2006, Peugeot made the announcement of 2,500 job losses with the closure of the Ryton plant after 60 years of car production in the UK. At the time over 5,500 jobs were being advertised at the local Job centre in Coventry and Warwickshire. By the following month this figure fell to just over 5,300 (National Statistics 2007a). During the past four to five years over 20,000 manufacturing and service sector redundancies have occurred in the sub region (Myles 2007:6). The closure of the Ryton plan marked perhaps one of the last big closures of the twentieth century mega plants in the area.

It is important to note that the not only the closure of these companies counts towards unemployment but also affect the supply chain. There are however, some businesses that though are affected, survive. For example, by means of making redundant a percentage of their workforce or perhaps downsize business activities. Peugeot Ryton, had a shallow supplier network in the UK and so only a relatively few firms were affected. However, Rover, which collapsed in April 2005, had much more far reaching consequences.

3.8 Rover – Longbridge

Rover closed its doors in April 2005, with 6271 job losses. Rover's roots are in the UK, and so a significant percentage of the network of suppliers were also UK based. It has been reported by the BBC that Rover's collapse could cost the UK as much as £600m. An inquiry was launched in January 2006 by MPs to probe the reasons for the collapse of the car company. The public accounts committee reported that the £600m figure also included the government loan, which will be written off, as well as a £500m disparity in Rover's pension scheme (BBC News 2006). Table 4 shows what the employees at Rover did, six months after the factory had closed down.

Table 4: Life After Rover

Source: (Paul 2006:32)

These interim results of 570 (indicative results not absolute) employees, shows there was high number of employees who were unemployed. However, by February 2006 almost 4,000 (63%) individuals were back in work. Over 2,000 people were reported to have undertaken some form of individual assessment and/or training provision, of which, 1,111 received work, as a result of undertaking training. By the end of the year it was reported that 66% of the Longbridge workers were back in work however, on average they were earning significantly less than they were at Rover and almost half believed they had worse jobs (Boggan 2006).

The taskforce set up to enable Rover employees to get back into work developed the Service Level Agreement. This was forged between Jobcentre Plus and the Learning Skills Council (LSC) to deliver “a variety of vocational courses, both long and short term, as the path to new employment”. (Paul 2006:11). One of the major issues was to avoid losing people with manufacturing and engineering expertise within the West Midlands because of the closure. As a result, the ‘Skills Hub’ was established. The emphasis of the Skills Hub was to provide training support, which ran through to 2007. It offered:

- a travel subsidy up to £75 for 20 weeks;
- minimum NVQ2 training for employees;
- wage induction subsidy to employer £50/wk for 12 weeks.

The Jobcentre delivered the recruitment opportunities to Rover employees while the LSC delivered the skills element and payment administration. Of the 115 people surveyed, surprisingly, HGV/Forklift Truck driving was the most popular new skill developed. 23.5% of people gained 19 qualifications between them, which in turn enabled them to gain new employment. 13.9% gained employment through acquiring IT Skills, People skills or Handling customer skills (Paul 2006:34)

One of the key issues identified by the Task Force was the need to “identifying and work with the... lower skilled workers concentrated in SW [South West] Birmingham and those disadvantaged in the labour market”. In addition, the report stated there was a “significant... mis-match between those seeking work and the employment opportunities attracted within the knowledge intense sector” (Paul 2006:23). This gave rise to the level of attention given to up-skilling for the Rover workers, to help them to have a better skills base, to assist in making them more employable within the current job market. This was further reinforced within the Longitudinal Study commissioned by the LSC and Jobcentre Plus which indicated that at the time 45% of the unemployed respondents were not confident of finding work in the next twelve months (because of their lack of transferable skills) (Regeneris Consulting 2005:15). Interestingly, this base data also showed that by

August 2005, 68% of the employees at Rover who were still unemployed were over 41 years old and this group had the highest proportion of unemployment (Regeneris Consulting 2005:72). These people, had in some cases, been working at Rover for quite some time and so did not develop their skills bases. Much of this group comprised of labours and so have a specific skills base. Applying these skills to other jobs within manufacturing was not so simple.

As mentioned earlier, one of the barriers preventing individuals back into employment is a lack of confidence. This can emanate from the gap between your skills and capabilities, and skills required for the job market, also confidence to apply for and interview for new jobs. Chen *et al.* (2006) state that in order

to remain at the forefront and maintain a competitive edge, companies must have a good capacity to retain, develop, organize, transfer and utilize their knowledge resources. (Chen *et al.* 2006:6)

A survey by EEF the manufacturers' organisation, reinforced the notion that training if linked with the businesses' strategic goal links to better productivity and in turn profitability (Hopley, Radley & Berkman 2006). The survey showed that companies which place greater importance on business planning and targeting the right types of training across the entire business get more out of their training efforts. One example of such efforts, are SMEs who have Investors In People (IIP) accreditation. The framework links training to the business strategy and in turn is communicated to employees. However, the survey also showed that only 10% of SMEs in manufacturing are adopting the framework (2006:20). The resources deficiencies SMEs experience results in SMEs looking outside of their own boundaries for information and knowledge (Chen *et al.* 2006) and collaboration to become either IIP or seeking external training acknowledges this notion to some extent.

Manufacturers still face a range of barriers to increasing their investment in training. These include the bureaucracy associated with the current system of funding training and a lack of clear information on training courses and providers. To help eliminate this barrier, initiatives such as the National Skills Academy for

Manufacturers (NSAMA) is being developed. However, as stated earlier they do not go far enough to cater for all of SMEs requirements, section 3.9.1., looks further into this.

3.9 Industry Support

There are two main initiatives set up by the government to help support SMEs within the manufacturing industry. The aim is to provide a pool of knowledge to support businesses in their business functions, employee support, bureaucracy, training, health and safety and competition.

3.9.1 Advantage West Midlands And Manufacturing Advisory Service

Advantage West Midlands (AWM) is the Regional Development agency (RDA). It has a key role in supporting the Manufacturing industry and the economic development of the West Midlands. They aim to strengthen the sector by becoming more knowledge – intensive. There are three main areas AWM focuses its economic development strategy upon (Figure 5).

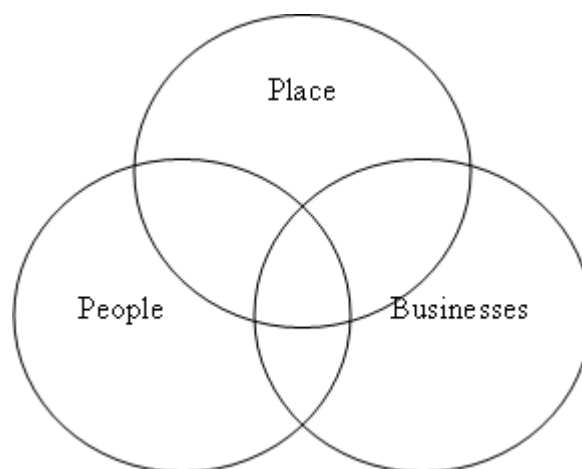


Figure 5: AWM Elements For Economic Development

The main source of direct support and advice for the West Midlands manufacturing SMEs and large companies alike comes from the Manufacturing Advisory Service (MAS-WM), funded by Advantage West Midland. There are also other subsidiary groups such as Business Link but they offer help and advice to all business regardless of industry.

MAS-WM is one of ten Manufacturing Advisory Services around the country. West Midlands Consortium Ltd, a partnership between EEF West Midlands, Warwick Manufacturing and Business Link, run MAS-WM. They provide direct assistance on manufacturing issues whether technical or training on principles, tools and techniques associated with manufacturing. Training provided is hosted by MAS-WM and is not tailored specifically to one individual but rather a broad spectrum of manufacturers.

Since the closure of Rover, AWM along with the Learning Skills Council and Job Centre Plus has played a pivotal role in the redeployment of employees in the job market. The aid provided has been in the form of funding for supporting individuals whilst training, delivering training, skills assessments, preparation for applying for new jobs and interviewing techniques. Taskforce set up to review the affect of Rover's closure has praised the aid offered by these groups. However, of these groups, none have gone far enough to address the long-term implications of a lack of transferable skills in manufacturing.

3.9.2 National Skills Academy (NSA)

The group mentioned in section 3.9.1., only provides a broad support mechanism for SMEs and large organisations in Manufacturing. However, they do not address the deep rooted issues affecting the SMEs in Manufacturing such as their investment in training, bureaucracy with funding training and a lack of clear direction to tailor training to specific strategic and operational needs. However, in the 2007 NSAMA was established to address the aforementioned issues by focusing upon meeting the skills needs of both large and small employers from the manufacturing sector.

The Academy will train employees and managers in large and small employers [to ensure that the UK can continue competing on a global level in the face of tough overseas competition], encouraging them to work closer together in the supply chain to ensure that the skills of the entire manufacturing workforce are being lifted. By 2012, the Academy will be supporting the learning and skills needs of 40,000 people per annum (Anon *n.d*).

The onus of the initiative here is to deliver vocational education and training for school leavers and adults, tailor made to meet the specific needs of industry sectors and those who work in them. The emphasis is not on having bespoke training for the individual within manufacturing, but to establish a national framework network for manufacturing.

...over-time it is expected that [NSAMA] they will form close links with schools and so significantly influence the whole pattern of education for school leavers (Anon *n.d*).

The training is through colleges, universities and local providers. The development of the programmes is through employees, employers and other leading groups liaison within manufacturing, to ensure that the training programmes deliver sector specific training. This up-skilling will enable the attainment of qualifications in three areas:

- Management and Leadership;
- Productivity and Competitiveness;
- and Technical Workforce Development.

The programmes take a top down approach where training courses already available have been taken under an umbrella and geared to a specific industry market. However, there is a need for a bottom up approach for Manufacturing, where a number of factors including: current skills; organisational aims and objectives; job skills requirements; time; technological resources; learning style; and skills gap need to be taken into consideration and then a programme developed and subsequently tailored to the individual to enable effective training to take place. NSAMA does not come close to addressing the specific requirements of individual SMEs but addresses the skills requirements of the

Manufacturing industry as a whole regardless of size. It hopes to enable the declining manufacturing industry as a whole to compete more globally.

3.10 Reflections

This chapter evaluated the relationship between SMEs and the economy and their role within different industrial sectors with a view of identifying a specific industry to focus this research. Manufacturing has a profound impact upon the Coventry and Warwickshire region through its employment rate, business numbers and the level of dependency SMEs have upon other businesses within the industry. However, more importantly, the industry is experiencing a continuing change resulting in decreasing output, increasing unemployment and an increase in the number of SME closures. These experiences are not specific to this region but are also evident in Europe.

The level of training provision specifically for Manufacturing was assessed in this chapter. The lack of specific training provision for SMEs from public initiatives highlights the importance of establishing such provision in the light of the economic downturn.

The aim of this research is to develop a model to facilitate web based, in-house training for SMEs and based on the factors detailed above the focus for this research will be on Manufacturing. A group of SMEs within manufacturing are identified in the fieldwork to further develop understanding of training requirements and factors affecting the way in which SMEs training in house. This understanding will enable the development and enhancement of the training model. However, before steps can be taken toward developing the training model, it is important to understand what literature tells us about training within the work place, methods for delivery, type of training, barriers and current models. The following chapter will provide the first step in developing the Preliminary Design of the training model.

3.11 Conclusion

This chapter established that Manufacturing forms a large percentage of the SMEs in both the West Midlands as region and Coventry and Warwickshire sub-region. It has a significant percentage of the employment population working in this industry. Despite its decrease in output in recent years (section 3.6), and the continuing increase in unemployment, the industry continues to be a major employer in the sub region. It is important to enable the people who are becoming unemployed within manufacturing and construction to seek employment in other sectors or in other jobs within this sector. To do so, it is imperative to have a skills set that employers require and are transferable. This requirement is as applicable for the labour market (blue-collar workers) as it is for white-collar workers. Multi-skilling or transferable skills, has become a necessity for the 21st century.

Competition is ubiquitous in all industry sectors regardless of location. To overcome or at least gain advantage it is important to employ the right people with the right skills. A business needs to be able to adapt to its environment that inevitably will be dynamic. To adapt, the right skills set needs to be present. However, manufacturing which is heavily dependent on manual labour requires both specialised skills, understanding of technology relevant to the job and a sub skills set to enable the administration of the job. On this basis, it is very difficult for a SME in the Manufacturing sector to adapt to global competition particularly where countries like India and China offer cheap labour. However, having said that, it is important that SMEs are able to adapt themselves to the dynamic global environment so to stay competitive. Manufacturing will always remain important to the future prosperity of the West Midlands economy. To continue to be a major contributor to its productivity growth, it needs to respond to competition from emerging economies, production technologies, and ICT. To do this its very infrastructure needs to change and this needs to begin with education and up-skilling.

Currently, divisions exist within the workplace based on work areas and separate disciplines. This prevents people from working in more than one area. Multi-

skilling, which is near to non-existent within manufacturing, removes this and enables individuals to work in a variety of different tasks. This in itself has benefits for the SME.

The following chapter explores the skills set people have in Coventry and Warwickshire, the skills employers seek and the implications of multi-skilling for SMEs within the scope of training levels in the region.

CHAPTER 4 WORK-BASED TRAINING

4.1 Introduction

The previous chapter established that Manufacturing sustains a significant proportion of SMEs both nationally and locally. The movement from traditional manufacturing to a service or knowledge economy has opened the skills level of the employees in this industry. They do not reflect the level required to sustain competitive advantage. It was argued that in order to achieve competitive advantage it is imperative to have a skills set that employers require and are transferable.

It is an accepted notion that “knowledge is a critical asset for an organisation” (Wenger 1998a:1). UK SMEs urgently need to improve their competitiveness in the face of competition from France, Germany and USA (Khan, Bali & Wickramasinghe 2007). A learning organisation allows the business to transform itself in the light of competition (Pedler, Boydell & Burgoyne 1998). ‘Lifelong learning’ is now more a certainty than ever, driven in part by the need for the businesses to compete in global markets (Caldwell 2000:245). Learning can no longer be considered as a separate activity that “occurs either *before* one enters the workplace or in a *remote* classroom setting” (Felstead *et al.* 2005:359). At the turn of the century, the Government recognised the need for SMEs to put themselves on the E-Commerce’s map (Anon 2002). Along with the Bank of England, “a mixture of low margins, techno phobic management and poor IT investment [was said to be a] lethal threat to any business in the internet age” (Anon 2000). At this time, lifelong learning received a high profile with numerous reports and initiatives.

Traditionally, larger organisations have placed greater emphasis on training and managing the multi-skilled worker. Multi-skilled workers can be regarded as those who not only have the competency to carry out their duties as described in their job description, but can also go beyond and are prepared to undertake the responsibilities outside the remit of their job (multi-tasking) on the basis that they have the sub skills set (Reynolds 2004). Having multifunctional individuals has

huge benefits for any organisation. The benefits of which will be explored later in this chapter. However, multifunctional employees were not deemed to be a priority among SMEs, until now. SMEs are recognising the need for skills diversity in order to sustain competitive advantage and to lower staff turnover to survive in a changing economy.

The main purpose for businesses encapsulating training is to aid an employee do their job more effectively and in turn improving motivation and staff retention. Skills are a key factor in a rapidly changing, technology dependant and global economy (Jacobs 2003). The increased demand for high skilled workers leads the way for global and successful businesses (Lambert 2007).

This chapter explores the use and implications of training amongst SMEs. It looks at the level of provision available to SMEs and its quality.

4.2 Methodology

As already mentioned the focus for this research will be Manufacturing SMEs, reasons for this have been discussed in section 3.10. This chapter will now seek to build upon understanding already gleaned, with a view to conceptualising, what training is and why it takes place for Manufacturing SMEs and how this compares with training for SMEs in general, but more importantly, what value it provides the business and its productivity.

The model extract below (Figure 6) has been taken from section 2.3 (

Figure 3).

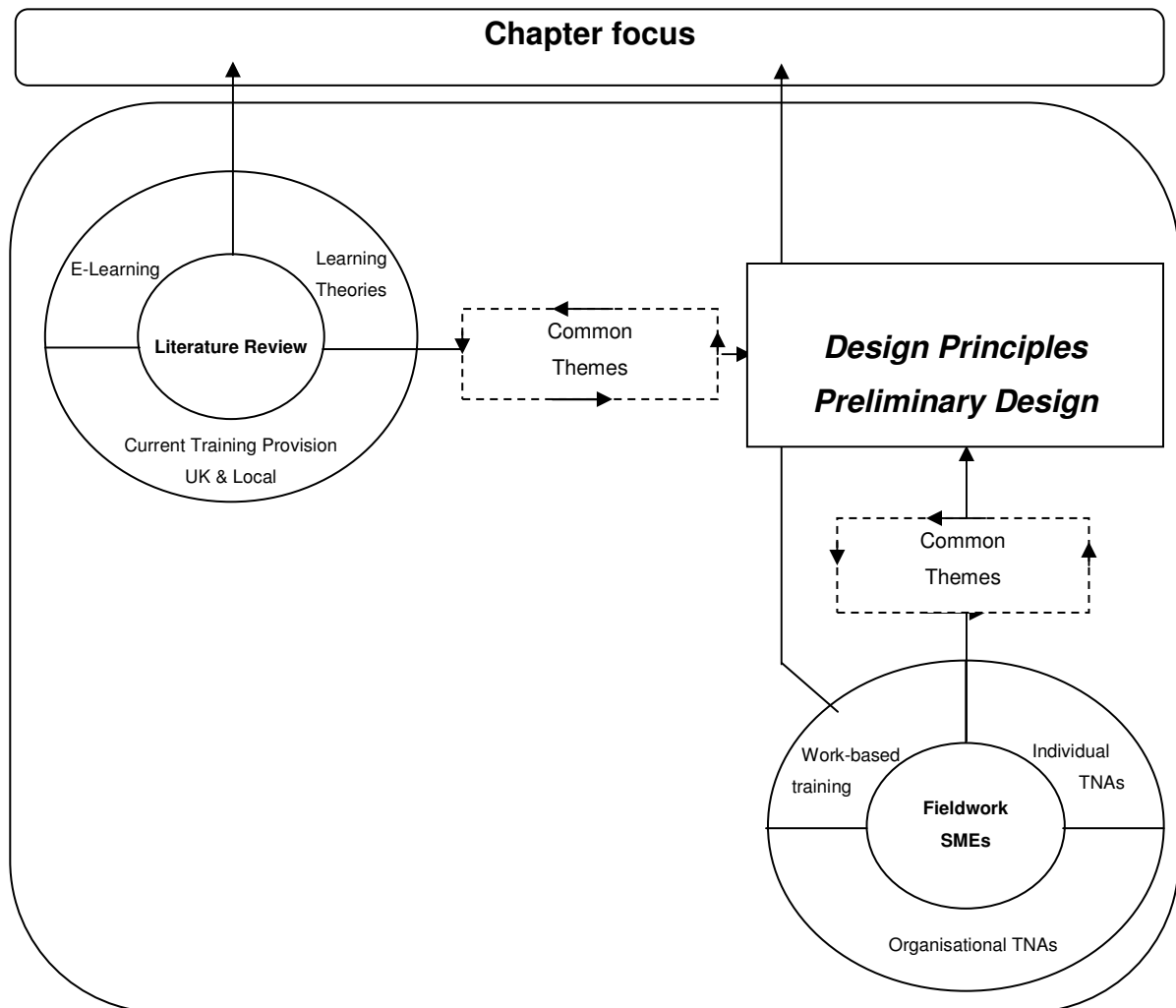


Figure 6: Chapter 4, Research Design

This chapter focuses upon work-based training, or in other words, training that takes place within the work situation. Similarly, to the previous chapter, changes that have taken place over time in training need to be mapped with a view of narrowing the parameters of the research to a specific group of Manufacturing SMEs. The use of multiple source Secondary Data combined with Archival Research enable a greater understanding and reasoning of the patterns of change over time and their implications for the future. The nature of the information required, is in part, based on historical data available from sources such as the

National Statistics office. However, complete reliance on this source would inevitably be constrained by the nature of the administrative records and documents.

The findings will allow the first steps towards developing the preliminary design for the training model for SMEs.

The consolidation of findings from chapters three and four will be evaluated and the reflections will determine which are the common issues that should be considered as part of the preliminary design for training. The 'Common Theme' is a process of reflection that aims to draw together those elements deemed necessary in the training model design. Reflections or section 4.15, documents the elements of this chapter, which are considered vital in shaping the training.

4.3 Training: In Context

Knowledge Management (KM) has a key place in any organisation that desires to succeed. KM can be defined as

...the systematic organisation, planning, scheduling, monitoring, and deployment of people, processes, technology, and environment, with appropriate targets and feedback mechanisms, under the control of a public or private sector concern, and undertaken by such a concern, to facilitate explicitly and specifically the creation, retention, sharing, identification, acquisition, utilisation, and measurement of information and new ideas, in order to achieve strategic aims, such as improved competitiveness or improved performance, subject to financial, legal, resource, political, technical, cultural, and societal constraints. (Lehaney *et al.* 2004:5).

To facilitate KM, organisations need to embark on training. The result of training is one that equips the workforce with knowledge and skills for effective decision making that achieves the goals defined in the definition above. Training can be defined as "... an instructor led, content based intervention leading to desired changes in behaviour" (CIPD 2006:1). Brogan (1999) argues that for businesses to grow and develop they need to view learning as an asset where productivity grows with employee development. The 'intellectual capital' of a business is gained through training.

Taking knowledge in the workplace and converting that knowledge into profit is application of intellectual capital. (Brogan 1999:5) ... Learning organizations ensure that individual and team learning contribute to systems – level organizational learning and that organizational learning leads to productive action (Brogan 1999:7).

Raelin (1999) argues workplace learning can be distinguished from traditional classroom learning. The learning process is centred around reflection on work practices. It is not merely a question of acquiring a set of technical skills, moreover, a process of reviewing and learning from the experience. Secondly, work-based learning considers learning as arising from action and problem solving within a working environment and thus is centred on live projects and challenges to individuals and organisations. This then leads to the creation of knowledge and the sharing of problems and solutions. This view also reinforces the principle of Communities of Practice (CoP) whereby work-based learning is a problem-orientated process, which can be resolved within a community of learners (Lave 1988; Wenger 1998b).

Much focus has been given to large organisations and their training needs. Larger organisations operate on multi-levels from operational to strategic levels (Johnson, Scholes & Whittington 2006). Each level focuses on different activities, strategic levels providing long term perspectives that drive operational levels. Larger businesses are likely to have a Human Resources (HR) department dedicated to understanding the training requirements of individuals. Systematic assessment takes place to ascertain previous, current and future skills requirements of individuals which again is driven by the strategic outlook of the business. HR departments develop bespoke training in-house or bring in external provisions as they have the resources to contextualise training. Larger businesses are more likely to have management systems in place, allowing for systematic quality procedures and performance appraisal, leading to training for individuals with recognised qualifications. Their infrastructure caters for the training process (Carey 2000). This ability is brought about by the formal infrastructure which sub divides business functions and individuals roles within these functions. Comparatively, training is viewed as an investment rather than a cost. Clearly the ethos 'people are our most important asset' is put into practise here. Multi-skilling is an important factor to the business' success (Carey 2000; Jacobs 2003). Hence

reducing costs, improve productivity and efficiency with an enrichment of employee's jobs.

4.4 SME And Training Hindrance

SMEs operational demands and slim profit margins do not permit formalisation of training and development (Chaston, Badger & Sadler-Smith 1998). The responsibility for recognising the need for training either lies with the individual employee and in some instances with the observant employer. However, in the past five years there has been movement towards developing employee skills within Manufacturing (Hogarth & Wilson 2007). This movement has essentially been driven by globalisation and competition and as the Leitch Report (2006) acknowledges there is no room for complacency, there is much still to be done to ensure that the skills of the workforce are 'world class' and are capable of reaping the rewards of globalisation.

Unlike larger organisations, SMEs operate at an operational level concerning themselves with day-to-day activities more so and giving less attention to future direction, Mazzarol refers to this as "strategically myopic" (2004:1). Many SMEs simply do not have the dedicated resources for training because of financial constraints and as such the infrastructure for training is not in place. Many SMEs are owned or managed by one or two people. It is ultimately their responsibility in deciding if training is required. It is however, suffice to say that not all SMEs require training, but in order to determine whether this is the case, an evaluation process needs to take place ascertaining any requirements. The process, whereby the evaluation can take place, can only really be effective if there is a formal infrastructure in place.

Since 2004 there has been a 7% increase in investment by SMEs in training. BMG (2006:5) found that more than half of the employers targeted in the survey had invested in training in the 2006. It was felt that by having a formal infrastructure for training the employers would demonstrate commitment for training. Infrastructure for training consists of: Business Strategic Plan; Human Resources Plan; Budget

and Training Plan. These components can allow the employer to focus on the needs of the business, its resources and the business learning needs. The infrastructure brings together a formal approach to what training is required in line with the business needs and future direction. SMEs can channel their learning needs to support their business goals when they have these components. Further discussion about what these components are and their level of use by businesses in Coventry and Warwickshire, can be found in Appendix 1.

SME training and development can be complex and resource intensive. Many, because of their focus on the operational demands, do not have the realisation for training. This lack of attention, combined with, in some cases, a non-existent infrastructure, does not allow for the employer to be well informed about their training requirements. Identified training requirements or the availability of free training does allow create a realisation for training. However, this does not always bring about contextualisation of training (Walker *et al.* 2007). Walker *et al.* argue that SMEs are too busy to engage in training or any type of learning activity and that most training is of little value to them.

[Many SMEs are interested in skills development and training opportunities, provided that] they are directly applicable to the current situations in their business, [and as long as the] delivery process is carefully structured in terms of location, time of day, and length of each session (Walker *et al.* 2007:303).

SMEs do not have working hours for training and operate with a basic minimum number of staff making time a significant issue. Employers do not have time for employees to be away from their job to undertake training, as there is no alternative person to replace them at work for that time. For these reasons, SMEs consider training as a cost rather than an investment particularly as small firms face “resource poverty” (Kelliher & Henderson 2006:514).

Any training undertaken has a primary role and that is to bridge the skills gap that may exist. SMEs face unique problems whose origins lie predominately in the culture, structure, size related characteristics and financial constraints (Wyer 2000). There are many reasons why an employee would have a skills gap. Manufacturing a production based industry, has a significant number of manual

labourers. The skills levels of individuals are closely linked to their job. Unlike with larger organisations where multi-skilling is evident, manual labourers' skills are specialised. Associated with this is the lack of experience of these employees in other areas (IFF Research 2006). As findings from the closure of the Rover plant found many of the employees were over 45 years and had been working for Rover since having either left school or college (Paul 2006). The skills they possessed were limited to the skills requirements in Rover. This realisation initiated training programmes implemented by the Learning Skills Council (LSC) to achieve both up-skilling and development of knowledge and experience for making individuals employable.

Many SMEs do not invest time and financial resources into developing their workforce. Though many managers often cite 'our people are our most important asset', is not necessarily reflected in the levels of training provided. This lack of training, leads to many problems, which only further increases the skills gap (Hogarth & Wilson 2007). Changes in the manufacturing industry have affected local SMEs in a variety of ways, namely: increased competition; globalisation and business closures. The latter implication has an added dimension, which relates to the inability of SMEs to keep up with the changes in demand and leads ultimately to business closure. The failure to train and develop staff results in a skills gap, which though can be somewhat resolved through recruitment leads to a high turnover in staff, a lack of motivation and low morale (Jacobs 2003). Many SMEs require specialist skills, finding such people who are equipped with such skills can be either difficult. Therefore, to overcome this difficulty training becomes imperative.

Hindrance to training does not only relate to SMEs resources, to understand other reasons focus needs to be broader and upon issues such as who are the employees within the business, their views about training and why there is not a strong desire to take up work-based training. Martin (2003) suggested that family and financial responsibilities are reasons why many employees welcome workplace learning as a means to gain qualifications or certification. However, time to integrate training that is provided to those SMEs, is problematic.

4.5 Training And SMEs

Training instils a 'culture of organisational change' by allowing employees to learn within the work environment and then applying new skills to their work tasks (Illes 1994; Kelliher & Henderson 2006; Khan, Bali & Wickramasinghe 2007; Leitch 2006:105). However, this process is constrained, if not anchored to, the business's strategic direction (Riding 1993). The key difference with learning, is that it is self-directed, leading individuals to adaptability. The pivotal Leitch Report suggests that by 2020, 40% of the population should hold level four qualifications (bachelor degree). However, by 2020, 70% of the population are likely to be out of the formal education system. It therefore falls to employers and employees in turn to develop the workforce skills level to ensure that the economy is able to compete effectively at a global level (Leitch 2006). Also, as Illes (1994) suggests, what are the other ways that could integrate work and learning whilst addressing four challenges for theory, research and practice, which are: how to develop learning organisations; how to promote learning cultures; how to enhance learning processes and how to build learning communities. Before looking at this upward turn for training and skills development, it is important to put into perspective the current trends in training within manufacturing.

SMEs in the UK represent a potentially huge market for training providers. Manufacturing SMEs, which represent 99.5% (section 3.2) of the businesses in this industry, within the UK, represent an equally important avenue for training providers. It has already been illustrated, that training would be a path to enable the manufacturing industry to respond rapidly to market demands. The need for up-skilling within this sector is crucial in order to sustain and grow in this fluid market. By ensuring that the staff within the business have an adaptable skills set, SMEs must be able to adapt to its' dynamic environment (Caldwell 2002:47). SMEs desire the improvement of business processes and achieve greater efficiency growth, without extra costs or overheads.

The West Midlands has one of the lowest levels of training for employees of any region - only 10.4% of employees received training in 2006. In the past two years levels of On the Job Training (OJT) provided to employees has seen a slight decrease, from 10.7% in 2004 to 10.4% in 2006 in the West Midlands, however, Coventry and Warwickshire has seen a steady increase, from 18.2% to 23.6% in 2006. This trend has also been evident in Production, with an increase from 16.7% to 23.2% in 2006 (National Statistics 2006). Levels in training uptake generally for SMEs have steadily increased over the years which in part are due to employers being encouraged to implement in-house training and development.

Goss and Jones (1992) identified three training patterns they refer to as:

- restricted trainer – providing informal on the job training, typically done by SMEs in house;
- instrumental trainers – training which is vocational or technical nature;
- sophisticated trainers – those who in addition to instrumental training provide training of a more developmental and innovatory nature. Larger firms have predominately this type of training.

Informal learning fulfils real needs of SMEs and can be important in developing more formal learning approaches. Formal learning approaches relate to initiatives or schemes with clear outcomes and objectives, which have been structured to fulfil training requirements. There are many schemes organised by the government for training SMEs, promoted to stimulate training. The main government department involved in this effort is The Department for Innovation, Universities and Skills (DIUS). It brings together functions from the former Department of Trade and Industry (DTI), including responsibilities for science and innovation, with further and higher education and skills, previously part of the Department For Education and Skills. One of the main objectives of this newly established department is to improve

...the skills of the population throughout their working lives to create a workforce capable of sustaining economic competitiveness, and enable individuals to thrive in the global economy (DIUS 2007:1).

The government acknowledged the findings of the Leitch Report (2007) and as a result of The Further Education and Training Act 2007, DIUS, was established. Previous attempts by such initiatives have failed to generate training uptake by SMEs (Senker 2000). The reasons for this will be explored later in this chapter. However, according to Rothwell (2002), business leaders need to commit sufficient financial resources and time for workplace learning, while establishing realistic goals and expectations for learning, this will be explored further in the next chapter.

4.6 Training Provision

There are essentially two types of bodies for training provision for SMEs: public and private. Public sector provision is funded by Business Enterprise Regulatory Reform (BERR) (formerly Department for Trade and Industry DTI), where initiatives such as Modern Apprenticeships (MA's), The Connexions service, Investors In People, Welfare To Work and Work Based Learning For Adults (WBLA) can be found. In the last year, 32% of employers in the UK had received funding support for training through these schemes (Lambert 2007:35). Public funded training and support is delivered to UK businesses through four main avenues. They are:

- Learning Skills Council (LSC);
- Regional Development Agency – for the West Midlands it is Advantage West Midlands;
- Business links;
- Sector Skills Council (SSCs) - NSA operates under SSC.

The other avenue is private funded training, which was funded through both DTI and the Department for Education and Skills (DFES) but is now controlled by the Department for Innovation, universities and Skills. This covers four areas of training for school leavers and graduates, professional and technical training, functional training and management and organisation development training. Training for school leavers and graduates includes vocational training run by

Further Education (FE) or Higher Education (HE). In 2006, 22% of employees in the region undertook a National Vocational Qualification (NVQ) and 11% an Apprenticeship (BMG 2006:86). A popular course, the NVQ, is run by FE, but failed to take off with SMEs because of its complexity, narrowly focused approach and the work involved in implementing assessment procedures. The training system did not respond to the training needs of employers. There is a consensus that training does not reflect the reality of business, the content is not focused to meet the needs of business, time and place does not suit the business and in some cases the employee (Foster 2003). NVQs failed to stimulate training and up-skill SMEs but did help larger employers who had the infrastructure to take the business forward.

Many SMEs have difficulties assessing where and how to get funding for training. The complexity of the process of obtaining funding has put off many SMEs in pursuing public funded training (BMG 2006; Hopley Radley & Berkman 2006; Lambert 2007). The National Council for Vocational Qualifications did not consider the constraints on SMEs and their slim profit margin, who unaided, cannot always meet the bureaucratic demands from funding bodies. There is much information about training opportunities for SMEs, however, there simply is not the confidence that the training is fit for purpose and of high quality (Senker 2000).

As already mentioned in the previous chapter, the West Midlands rely heavily on manufacturing as a source of employment and economic growth. A large pool of labour remains available but often individuals lack the necessary blend of skills, experience and basic abilities. In response to this it seems too many employers prefer to compete for skilled workers, rather than invest in training, potentially fuelling inflationary pressures for reducing the regions competitiveness (BMG 2006). Therefore, it is vital, that SMEs move away from their short term, reactive approach to training which fails to identify and address true skills shortage. Retraining and up-skilling provides a springboard for employees to reduce and even close the skills shortage gap (Leitch 2007).

The need for training can be ad-hoc and usually takes place with the help of external sources, when the need arises, rather than through a process of training evaluation (Senker 2002). In 2006 as many as 16% of employers reported they had a skills gap, that is to say a growing gap between skills that are required by employers and the skills that were available to them through the existing workforce (IFF Research 2006). The downward turn in manufacturing and skills availability has been difficult for SMEs to address. According to the National Employers Skills Survey (IFF Research 2006:8), over 88% of establishments had experienced difficulty recruiting people with the right skills. This high percentage is a worrying statistic for SMEs who rely on specialist skills (Myles 2003). A survey conducted by BMG (2006), looked deeper into issues of training with employers in Coventry and Warwickshire. They were asked to rate barriers to business growth, the results found competition came out at top with 39%, followed by red tape, market size and the availability of skilled labour at 36% on average. However, within Manufacturing, availability of skilled labour is an issue with almost half of all businesses in Coventry and Warwickshire targeted in the research, at 43%. This clearly demonstrates that employers experience difficulty in employing people with the right skills set as well as making provisions for up skilling (BMG 2006:38).

It is important that employers, particularly within Manufacturing are able to either find (i.e. recruit) or up-skill. In Coventry and Warwickshire, 8% of employers said there was a lack of training available locally to them (BMG 2006:38) which is a concern for SMEs who need training provision to be readily available particularly as they operate at an operational level (Walker *et al.* 2007). In 2000 the key factor referred to by employers, which prevented them in providing any training to employees, was the “inability to give staff time off work to attend training courses” (GHK Economic & Management/BMG 2000:v). This issue is as prevalent today as it was then, SMEs cannot release staff for training as they simply do not have the resources to manage.

4.7 SMEs And ICT

Manufacturing has seen a decrease in the recruitment of new staff during the past two years. Technically demanding vacancies have been very difficult to fill, finding the relevant skills is both time consuming and financially demanding.

“The application of ICTs have revolutionised the way that a business is conducted, [however] SMEs are described as the slowest to embrace e-commerce” (Duan *et al.* 2002:431).

The increased use of information and communication technology (ICT) in business has pushed the recruitment of new staff. A survey revealed that 83% of firms in Coventry and Warwickshire use IT or computers, of which 69% have access to the Internet via broadband, and 69%, have their own website (BMG 2006:41).

Table 5 shows what the 83% of businesses who utilise ICT and their application.

Table 5: Use Of ICT In Coventry And Warwickshire In 2006 (BMG 2006:42)

There has been a shift of focus from optimising output from employees and investment in machinery to a dependency on the use of technology in everyday working practises. There is more onus is upon the employee, and as such, investment is for the employees and training in the tools used for work. However, any training provided is reactive to present needs rather than building on capabilities for the future. This movement in training for the future has changed the face of the type of training SMEs are now undertaking. Some of the problems

SMEs experienced internally relates to the use of IT. Many SMEs do not have the benefit of employing dedicated IT staff to help resolve technical problems. This makes it even more important to have employees who have a proficient level of IT skills. A skilled and adaptable workforce is vital to SMEs particularly within Manufacturing, to ensure they can sustain competitive edge. Training has a key role to play in meeting employers' skill requirements and at the same time building productivity levels (Foster 2003).

LearnDirect is a nationally recognised brand for learning for post - 16 learning was developed by the University for Industry (UfI). They deliver a range of products through three streams career advice; skills and qualifications and bespoke work-based e-learning packages for businesses. Interestingly, as much as 80% of Manufacturers in Coventry and Warwickshire, are aware of LearnDirect, but only 7% took up any training with the provider (BMG 2006:81). It was found that time and cost were one of the greatest difficulty in investing in such training. LearnDirect do provide bespoke programmes, but by their own admission, they are for meeting the larger businesses needs. Though there is awareness by SMEs of e-learning and specifically LearnDirect programmes, there is not the paralleled level of uptake (UFI *n.d*). E-learning and online learning clearly plays a key role in staff training and development.

The reduced cost and increased capabilities of computer technology have triggered the dramatic increase for the acquisition of ICT by businesses. The rate of acquisition has exceeded the employee's skills level. This has led to a labour shortage in some skilled positions, leaving employees in situations without the relevant IT skills. In relation to this, there is a growing trend to adopt IT into the organisation. Such is the organisation whose performance is hindered by employees who are without the necessary skills to understand and use the technology available and headed by a management team who do not utilise IT to benefit their organisation in economical, productive and systematic means. The time and resources available to SMEs for training are minimal, a workforce that is over run by operational demands and has little time for anything else (Samra 2001b).

Technology plays a key role within training. Developments in computer technology have lent themselves to today's training approaches. The adoption of teaching and learning online has not only been applied by schools, colleges or universities, but also by businesses in every market sector. Popularised by developments in bandwidth and communication technology capabilities, e-learning and online learning as a method, for training seems to be increasingly advantageous to those whom take it on board (Holmes and Gardner 2006). The Guardian newspaper reported that "More than half of the population now has accessed the Internet", (Cassy 2001) accessibility of the technology should be an advantage to SMEs.

New learning methods play an important part in staff training and development, in an employment market where individuals change both their occupation, and their employers. A job for life no longer exists as it once had (Anon 1997). The report entitled Commission On Technology And Adult Learning (ASTD/NGA 2001:4) defines e-learning as "instructional content or learning as delivered or enabled by electronic technology". Use of the Internet or other IT technology has been impinged by inadequate skills of employees. Subsequently, one in five employers in 2006 invested in training in basic IT (BMG 2006:84). E-learning is used by around 38% of all businesses which have trained. Employers are making a greater use of ICT for training/learning purposes and more importantly the majority of training was delivered during work hours. Popularity in using broadband by SMEs has fuelled the use of e-learning and online learning. Based on this it would be justifiable to suggest SMEs would benefit from an online training service that must be tailorable for the individual. A training application delivered online would offer a solution for delivering training just in time (Urdan & Weggen 2000). Chapter Five will explore the implications of e-learning and online learning as a training tool for SMEs.

4.8 SMEs And Training Uptake

There are many barriers for SMEs to provide training. There is a paradigm shift, whereby, employer's awareness for the need to train has increased as they recognise the benefits for business. The reasons for this are twofold, Business

requirements and Employee requirements. Hopley, Radley & Berkman (2006) argue in order for employees to achieve job enrichment resulting from job satisfaction, motivation and morale, employers need to train. It is accepted, that there exists a link between a more highly skilled workforce and improved productivity, and a belief that by investing in training can yield a positive impact upon efficiency and in turn financial gain (Jones 2002; Walker *et al.* 2007). Amongst manufacturing, employee retention is a significant problem as it is difficult to find necessary specialist skills in the labour market. Similarly, the nature of manufacturing necessitates the adoption of new technologies and methods. Finding personnel who are capable of using them can be difficult. It is felt that this can only be resolved through training (Rainbird 2000).

Many SMEs within manufacturing are struggling to find training programmes, which fulfil their training requirement, e.g. Food Manufacturers need training on food processing and manufacturing, specific courses on both are not available. Current provision in training does not address all these issues, they are generic and do not consider the individual but moreover the industry as a whole. This is particularly so when you consider the list of programmes LearnDirect have that range from Leadership and Management to NVQs. The generic overview allows for general issues to be addressed such as the need for qualifications, the low levels of literacy and numeracy skills (Jones 2002) but it does not address issues such as the operational difficulties or the resource constraints an employer must contend with.

To understand why SMEs undertake training, it is important to consider what trends there are in training investment. Clearly, the types of training employers invest in vary according to the type of business and the industry they are within. Lambert (2007) proposes a generic model in which training programmes fall. SMEs take training:

- to enable employees to do their current job;
- to raise quality of services;
- to raise leadership and management skills;
- to accommodate new equipment/work organisation;

- is designed to raise productivity;
- to improve individual employability;
- to improve basic literacy and numeracy skills (ibid.:34).

Many SMEs are committed to enabling their employees to take training to help them do their job and in turn maximise productivity and performance. However, despite many funding initiatives being available the provision of training for employees by SMEs has not dramatically increased. The reasons identified above highlights the general remit of training programmes required. According to BMG, ICT was one of the main areas in which training was sought (BMG 2006).

4.9 Why Do SMEs Not Undertake Training?

Not all SMEs undertake training, the reasons for which links to the constraints of the business. The need for training arises if a gap is identified in skills and job requirements and a realisation that training can fulfil that gap, or if a formal procedure of training assessment is carried out. Many SMEs are under the false assumption that their workforce is fully proficient, if the training realisation is not recognised. Smaller businesses that survive in an operational environment focus learning and training initiatives through informal methods, essentially Situated Learning. This form of active learning works, whereby a trainee observes an experienced staff in how to do their job and is then able to apply their new knowledge in the process of skills acquisition. Lave (1988) argues that learning as it normally occurs is a function of the activity, context and culture in which it occurs. It is argued, that knowledge is of no use if it is so abstracted away from such a context that it cannot be usefully applied and understanding will be so tenuous that it will be easily forgotten. This method of training and learning appears to be successful to understand the fundamental work practices. This method's success has its antecedents in an employee who already has experience and training. With very small businesses, the need for formal training may not be required. The training requirements for very small businesses can be catered for in house, using a form of situated learning.

The provision for training is not always readily available in all areas of the country. Good quality training provision available locally is more likely to have uptake. Any training SMEs encompass, needs to be employer led (who may or may not know where to get the training from), with a suitable support structure present to help manage the organisational change. However, for training to take place employers need the time and tools for training. Manager/Owners who do not have time may not be as forthcoming for the need for training. The need for training for many businesses arises after the business has been operating for a certain period.

Proficiency of staff was considered to be one of the reasons employers did not seek training (IFF Research 2006). Employers, Managers (informal infrastructure) or Training Advisors (formal infrastructure) assess whether or not an employee requires training. The subjectivity of the Employer and Manager cannot always result in the correct conclusion for the employer and business alike. The use of observation rather than an assessment of training needs may be completed by a Training , who may decide that a staff member is proficient and does not require training. This subjective deduction can result in an ill-informed decision which is based on resources constraints and 'myopic' outlook of the business a view supported by IFF Research (2006).

4.10 Training Problems And Barriers

The culture of training in a workplace yields an increase in innovation in strategies and products (Khan, Bali & Wickramasinghe 2007). SMEs that are internally adaptive and responsive externally will be competitive in the face of globalisation, leading them to new opportunities in the market place.

Investors In People (IIP) is a highly regarded quality standard. The quality standard requires that businesses formalise operations. It also considers training to be a core function of the business structure and as such requires systematic review and evaluation procedures to be embedded to enable individuals to take up opportunities in training to enable the business achieve its mission. The process SMEs undertake for IIP aids them in better risk management. Businesses who are accredited 'Investor in People' must allow for training to take place. Despite

the virtues that training can bring it does not mean that all training undertaken will lead to success. There are certain elements, which can deem a training and development programme a failure or stands in the way of achieving optimal results (Phillips & Phillips 2002). As with IIP accreditation, training needs to be aligned with the business needs. A match needs to be made with the individual's learning requirement and the business requirements.

Training must be *driven* by the business needs of the organisation. If the link to business needs can be established this will ensure that the training is focused on the real issues and demonstrate its relevance to the business. It also provides the vital starting point for any evaluation of the training (Bee & Bee 1994:4).

This alignment ensures that the newly acquired knowledge and skills can help in business improvement. More importantly, and as previously mentioned, the need for determining how to incorporate the training into working practice will start from this point. The process of identifying training requirements can be both formal and informal. This approach is usually based on the size of the organisation, the smaller the less formal the evaluation. The evaluation process does not always highlight non training solution. Organisational restructuring, process/operational changes or recruitment can be just some of the alternative reasons for business improvement. A lack of objectives without clear direction and focus can steer you to training which is irrelevant to the business.

A pilot research project documented in 2007 acknowledged the need for a training programme specifically for SMEs that considered the resources, strategic constraints and lack of knowledge and skills where delivery is web-based training. The TRIMAR project results confirmed the need for up-to-date content, which is relevant to the SMEs environment and developmental changes, but also the need for incorporating "human intervention... such as expert tutoring sessions, online community, and discussion forum" (Mullins *et al.* 2007). The role, human intervention has in online training, is very important and shall will be explored further in chapters four and five.

Phillips and Phillips (2002) state there are essentially five elements that must be addressed if training is to generate the Return On Investment (ROI) the employer

seeks. Firstly, the solution needs to be cost effective. As stated earlier in this chapter, a slim profit margin is a preventive element to training. Expensive training solutions will not deliver the results the employer seeks. Secondly, regarding training as an event. Training considered as a function of the business gives it the acceptance and value by employees, and in time, embeds itself as a function within the business culture. Thirdly, participants are not held accountable for results. Each person who undertakes training can only be successful if there is a support mechanism in place. This mechanism is time for training, employer support, relevance of training, and opportunity to take training. Fourthly, a failure to prepare the job environment. As part of the support mechanism for training employers need to ensure that the organisational culture for training is positive aiding an employee's readiness for training. A lack of management reinforcement and support do not give positive results for the business nor employee motivation and morale. A training commitment is two-fold employer and employee, without both the training events are ineffective. Fifthly, a failure to isolate the effects of training. As mentioned, the evaluation (providing feedback) of training is an important process, it not only allows employers and employee to assess the value of the training but it encourages you to think of process changes, which will benefit the business. It is hoped that these changes will improve business efficiency and productivity. This internal change process is vital to SMEs adapting to the economy and globalisation.

There are many problems that can deter SMEs from considering training. Many smaller SMEs do not have the strategic focus to determine which future direction they wish to take. Determining training requirements, when the business strategy is not in place, makes both the need and value of training, almost redundant (Bee & Bee 1994; Rainbird 2000). Time, financial constraints and resources, in-house skills, a lack of recognition for training value, organisational culture, resistance to change, a lack of understanding of training needs and a lack of awareness of available training only add to the barriers SMEs face in encapsulating training as a business function. SMEs in manufacturing have highly skilled employees. However, with the nature of employment, often those employees, who are multi-skilled, are doing so out of necessity. Minimal staff reduces overheads (Foster

2003) and as such lead to problems and barriers standing in the way of training and associated virtues for the SME.

4.11 Delivery

There are many key factors SMEs, in particular, need to address before they embark upon training their employees. The training provision needs to be based upon improving business performance and operating in a changing economy. The delivery of training by pro-efficient trainers, help to ensure the programme developed is clear, structured and constructive. The programme must be cost effective, flexible and customised to individual employers as well as employees' needs. The delivery must be flexible during work hours to allow for the continuation of business operations (Hopley, Radley & Berkman 2006). Many training programmes require employees to take time off from work to train, this time can be in-house or externally at another location. Consequently, employees are away from their responsibilities at work leaving the employer to manage work activities with minimal staff.

Delivering training programmes in the workplace can be very difficult for SMEs. Firstly, individuals are much more visible to one another and as such criticism from fellow workers and be difficult to take. As with classroom based learning, employees are reluctant to exposing their weaknesses for fear of dismissal or re-deployment. Caldwell (2000) argues that this behaviour is rooted within the management of training. Employers need to change the culture of training, where the process is seen as and promoted as one of individual and business betterment, rather than a process of highlighting individual flaws and weaknesses. Riding (1993:3) states that "good training" will have certain characteristics: improvement in employee performance; enhanced employee confidence; motivational increase in employees and in turn improvement in job processes and training will be efficient and cost effective, so that the improvement in job performance is more than matched by the cost of training. Riding gives much focus on the positive outcomes of training but does not address a number of other issues. These characteristics

broadly speaking are desired outcomes of effective, they are not however, the only requirements which SMEs would look for.

Employers need skills and knowledge that are transferable allowing the business to grow and at the same time sustaining its workforce. This is particularly vital for smaller SMEs where multitasking is pivotal, 'transferable skills' enables an employee to work in more than one area. The collaboration between the employer and employee to manage multitasking contributes to improving employee performance (Samra 2004). Riding (1993) implies that there is a link between the completion of training and improvement in employment performance. Employee performance can only be improved if the training was relevant to the job and if evaluation of training and work task improvement is considered and trialled (Riding 1993; Anderson 2007).

Eraut (2002) goes further to explain that a process needs to take place to be able to apply knowledge and skills from training at work. One needs to have an

...understanding of the new context; recognizing what prior knowledge is relevant to the current situation; transforming that prior knowledge so that it fits the situational then integrating the new assembly of knowledge and skills to create the required new situational understanding as responsive action (Eraut 2002:69).

This process of transferring knowledge and skills to the work setting can be both formal and informal, depending on the size of the organisation and how well established the infrastructure is. It also depends on the training the employee has undertaken and whether it is of 'added value' to the business. Value added training advocates both the employer and employee to the evaluation stage, which occurs post training. Eraut also found people learnt though seeking help and advice beyond the immediate work environment from other people within their own organisation, from customers and suppliers and from the wider professional networks. Section 4.13 considers the need for evaluation and its impacts on the effectiveness of training in more detail.

Work-based learning operates at both formal and informal levels within the workplace, and when informal, often relies on networks and interactions with

people both within and outside the organisation to facilitate new learning. The learning itself is often goal and work orientated. It is also often problem-centred and involves experimentation and trying things out. This method of networked learning is not formally recognised by SMEs however, it is a process, which is almost fundamental to the learning process. Wenger describes this process as a Community of Practice (CoP):

Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly (Wenger 1998).

Communities of Practice exist and dissipate as the need arises and if fulfilled.

Members of a community are informally bound by what they do together—from engaging in lunchtime discussions to solving difficult problems—and by what they have learned through their mutual engagement in these activities (Wenger 1998a).

This process enables employees to collectively, resolve problems and solutions are exchanged within the community. This method has many implications for training. The way in which employees are resolving work-based problems, collectively, need to be an aspect incorporated into the training framework. Chapter five will explore further how this process should be incorporated and its implications for training SMEs.

4.11.1 Qualifications

Trainers need to work closely with SMEs so that training programmes are tailored to work roles and specific skills of individual workers. Development of training programmes does not necessarily have to be qualification driven, however they can be regarded as a motivational factor. The prospect of financial gain and developing practice skills through training can also be a driving factor (Martin 2003). Many larger organisations have supported the idea that “training or skills development leads to higher salaries” (Heyes 2000:158). Furthermore Fuller and Saunders (1990) state trainees generally view certification of skills as important, there is a need for having tangible evidence that new skills and knowledge have been acquired. The need for qualifications is important in the recruitment process

where suitability of candidates is identified on the basis of 'tangible evidence' (Senker 2000:227). Evidence of this was further supported by the Learning Skills Council, who implemented training courses for redundant Rover employees, which were certified (Paul 2006). The need for certification is recognised by both parties, which, illustrates the value qualifications have in a training programme, as an indicator of achievement. This is supported by recent initiatives such as NSAMA and LearnDirect, where training programmes are certified.

Young (2002:45) argues that qualifications function "is to communicate something about a person's capability..." Qualifications are important as it gives an indication to how someone is capable of competently carrying out a specific task. However, the implications of this can be more problematic. Heyes argues that employers are concerned about permitting job related training, which is linked to qualifications for fear of "inter-firm mobility" (2000:159). As employees up-skill an increase in staff turnover becomes a primary concern. Employee's expectations can rise in light of new qualifications and potential opportunities. However, contrary to this, investment in training amongst SMEs was not high.

Results from empirical studies found SMEs who engaged in training fell within two remits. Firstly, those who are embarking upon training, as they were exploiting available funding or schemes within the area (Samra 2001a; Samra 2001b). These SMEs in most cases were small SMEs where individuals had diverse roles and responsibilities. Completion of training under these circumstances did not result in large numbers of employees leaving their workplace seeking opportunities elsewhere (only 3 employees left after training). The outcome was as the employer had hoped, employees working with the employer evaluated work tasks to improve processes and functions, a positive outcome was achieved. Secondly, there were SMEs who were familiar with training and had embarked on training in the past. These SMEs all had formal infrastructures. These infrastructures clearly defined individual's roles and responsibilities and training needs analyses were carried periodically but on an informal basis, except where SMEs had IIP accreditation. The result of training was both process (the way things are done) and function (productivity) improvement.

Employees training and achieving qualifications did not always result in an employee leaving work and moving on. There was a difference in employer and employee interests. Employees sought training to enable them to do their job or to do it more effectively, to enable them to take advantage of other opportunities within the same workplace or to up-skill to enable them to confront new challenges facing the business. Some did use this opportunity to seek more challenging work elsewhere, generally, training had a limited affect on the staff turnover. Many employees stated that they felt obliged to the employer who invested time and financial resources for training and as such they felt a 'sense of gratitude'. The resulting factor, job enrichment brought about higher morale, confidence and ownership work. Those trainees over the age of 40 years stated they were not likely to undertake adult learning courses through their own initiative and felt that seeking employment elsewhere would not be favourable to the employment status (Samra 2002).

4.12 Training Models

As already mentioned one of the emerging issues with SMEs is how to be reactive to business environment changes with speed, flexibility and innovation. Training can equip individuals with the necessary skills to enable the business to be reactive, however this training needs to be relevant to the job in hand, timely and bespoke to the individuals learning requirements. Advances in new technologies are making it easier to meet the needs of individual learners. Not only can learning environments be structured so that the learners can set the pace of their learning and control the delivery of information but, increasingly e-learning is able to cater for the individual learning styles of the students (Holmes & Gardner 2006:66).

Rainbird (2000) states that in order to make a training system more responsive to the needs of the industry and essentially a business, a number of elements need to be identified. These are:

- understanding that training can be achieved through a variety of areas e.g. vocational training, labour market programme, lifelong learner;

- common understanding of training needs;
- individual's taking responsibility of their own training and development concepts however, those with unsuccessful formal education should not be taking full responsibility;
- and issues of job insecurity be addressed (ibid.:3).

These elements help to develop understanding of the relationship between employment and the training system. Many managers cite that 'our employees are our most important resource' illustrates that there is a realisation that they are operating in a knowledge economy. However, this claim is not always supported through the resources allocated for training and employee development. As stated earlier the level of training that exist in manufacturing does not go far enough to develop a workforce who is prepared to meet the challenges of globalisation.

Undoubtedly, those SMEs who on the way to developing their workforce have many problems in implementing training strategies. Rainbird contributes this problem to the "tensions between different management functions and the ability of individuals to resist centrally formulated objectives" (ibid.:5). This tension arises from many employees not "acknowledging training as a core function of the business" (Carey 2000:19). Importance needs to be given in understanding learning as a process embedded in organisational structures. As the fieldwork (Chapter Seven) demonstrates many SMEs are moving into this direction, however, there are still those who do not recognise the value of this nor have prevalent infrastructures which allow for the presence of training.

The training culture, which in some SMEs exists, but is limited and in others is none existent prevents managers from incorporating company wide training strategies. The solution is a 'systemic perspective' of change management, which will aid in cultural change and the incorporation of training strategies. This process change is asymmetrical which means it is the shared responsibility of both managers and employees, the stakeholders of training. Though managers need to lead the way forward, employees are equally responsible in its implementation. Successful implementation of training strategies will be borne from a multiple

methods and methodologies (mix of focuses on Process, Structure, Culture and Political dimensions) of organisational change leading to an acceptance that training is a core function of the organisation (Cao, Clarke & Lehaney 2003). Training instils a culture of organisational change by allowing employees to learn within the work environment and then applying the new skills to their job tasks. However, this can only be effective, if anchored to the business's strategic direction (Riding 1993).

Manufacturing is faced with a reduction in the workforce, leading to the changing nature of work organisation in particular influences of assembly line production. Jones (2001) argues with Just in Time (JIT) production, none value added activities are eliminated to allow the business to address demands for "shorter cycle times, quicker decision points and more rapid deployment of services and solution" (2001:481). A similar technique to delivering training in light of advances in ICT and the exploitation of the Internet can be applied. JIT training is available on demand and be a more comprehensive training approach that links training and work performance requirements. Jones states that though JIT training is delivered on an expedited basis, it does not mean that the design process be circumvented. To help in the design process Jacobs (2003) proposes a model for On the Job training (OJT).

4.12.1 On The Job Training

The development of training programmes is not carried out with either Pedagogy or Andragogy principles at the forefront. Teaching within schools, colleges and university are underwritten with these principles in mind, the issue of how best to teach are central to the teaching and learning process. Training programmes emphasis lies with the content (Jacobs 2003). Content management is the driving force behind the development of many programmes. Trainers often think 'what the learner needs to know rather than 'how do I deliver the material to the learner?'. Emphasis on the latter is central to this research as well as considering the constraint SMEs face and how the content can be delivered to the learner/trainee based on principles of effective learning processes. There is a need to embrace business needs, constraints and resources and individual learning needs and

Pedagogic and Andragogy principles to provide a holistic training programme (Samra 2000; J.Van Zolingen *et al.* 2000).

One method of training which has gathered much momentum is On The Job Training. Job related or On The Job Training (OJT) as it is commonly known has many advantages primarily the training is tied with work practices and so has a positive impact on individual's motivation. OJT can be defined as

... the process in which one person, most often the supervisor or lead person of a work area, passes job knowledge and skills to another person (Jacobs 2003:14).

Essentially this is any type of training as long as it is funded or arranged by the employer. The flexibility of delivery is favoured by both the employees and employers this also makes it cost effective as little time is spent away from work and the job and greater emphasis is placed on active learning rather than the development of technical competencies (Pedler, Boydell, & Burgoyne 1998).

Findings from a 2002 study found that SMEs involved in training, majority of them are trained by experts within the company itself (Duan *et al.* 2002). In 2005, 10.4% of employees of working age received job related training within the West Midlands (National Statistics 2006). Production accounted for 9.8% of employees of working age receiving job related training in 2006. In Coventry and Warwickshire 23.6% of employees received job related training compared to 23.2% who were in Production in 2006 (*ibid.*). This form of training usually occurs in the work setting. The main principles to this form of training are rooted in 'observational learning' (Bandura 1977; 2001). The trainer shows the trainee how to perform a particular task and explains the key points, the trainee executes the task but builds up the task execution in stages which eventually leads to other stages. Once mastery by the trainee had been achieved the trainer allows the trainee to carry out the work tasks through supervision but ultimately the trainee takes control of the work tasks. This form of training and learning, which is still present in many businesses, was highly successful during the 1940's. OJT allows the process of skills acquisition to be faster and their application within the work situation to be more immediate and so there is reinforced retention (Jacobs &

Swanson 2001). However, despite all this there are drawbacks. This form of unstructured and most often informal training gave rise to Structured on the job training (S-OJT).

Training is considered a strategic activity, concerned with the way training is carried out. S-OJT is defined as the

...planned process of developing competence on units of work by having an experienced employee train a novice employee at the work setting or a location that closely resembles the work setting (Jacobs 2003:28).

S-OJT is linked to training objectives. There is a need to ensure training provision is linked not only to training objectives, but business goals. Thus, there is relevance of training. This form of training relates to the ability to perform specific units of work. The emphasis on the one to one training (trainer and trainee relationship) and specifies training will occur in the work setting. S-OJT makes use of a planned process rather than ad-hoc explanations of work activities as with OJT. **Figure 7** illustrates S-OJT system proposed by Jacobs (2003:31).

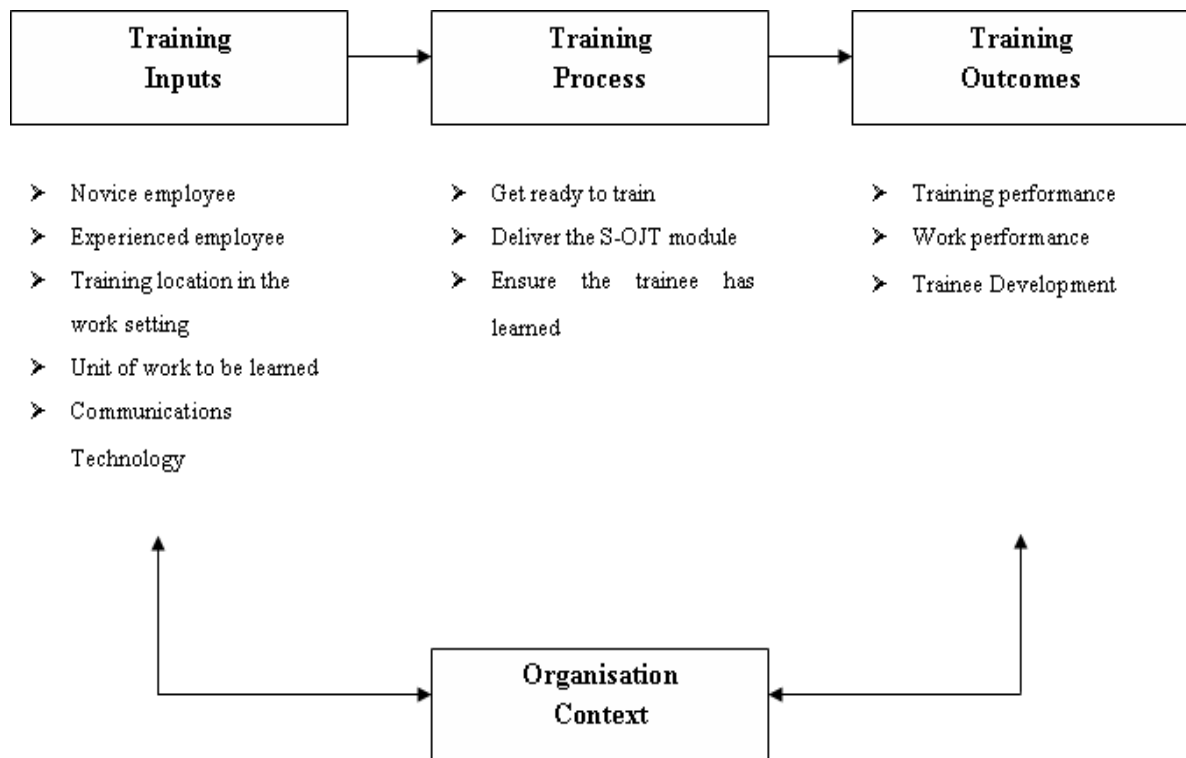


Figure 7: The S-OJT System

The model shows Training Inputs (TI), Processes and Outputs, these are affected by the organisational context in which the system exists. TI instigates training: An individual selected for training by the employer or manager, leads to the execution of a process within which the training content and delivery mechanism is determined. Once complete the outcome or the evaluation process is carried out. S-OJT as a process has six steps:

1. Decide whether to use S-OJT;
2. Analyse the units of work to be learned;
3. Develop the S-OJT trainers;
4. Prepare the S-OJT modules.;
5. Deliver S-OJT;
6. Evaluate and troubleshoot S-OJT.

S-OJT can be regarded as a broad platform for enabling training within the workplace. One consideration S-OJT fails to make is the way in which the training is delivered. Despite the fact the training should be work situated it does not go further to explain how to deliver the module content. It does not consider the

individual's learning style. Different people learn in a variety of ways (learning styles will be explored further in chapter five) and as such the training delivery should reflect this. The second problem with this model is despite the training is to take place in the organisational context, the training content is not formally linked to the organisation's mission and objectives. The focus on the training is to ensure that the individual is capable of doing the job but what the training does not consider is that the training being sought might be irrelevant and outdated. During the evaluation and troubleshooting stage consideration is given to determine whether the training objectives have been met, but what this stage does not consider is the business environment, therefore making the overall evaluation of the method even more difficult (Beaver & Hutchings 2005). Dynamic businesses, which are continually changing, require training which can be reactive to these changes. S-OJT does not go far enough to be reactive in a timely fashion to these changes.

Another problem with this training model relates to the way in which training is used for job performance. For training to be effective not only should the individual be able to do their job but be capable of applying their knowledge for job or task improvement. S-OJT does not go far enough to ensure that deep learning is achieved nor does it consider the training for job enrichment. Argyris and Schon (1978) distinguish between single and double loop learning. Many small firms exhibit low level single loop learning. This involves owners/managers in using their existing knowledge and experience to improve the efficiency of operation. Though single loop learning maybe appropriate for static environments, manufacturing processes require adaptation to the economic trends, which single loop learning does not enable (Senge 1990). The process of evaluation in S-OJT does not formally consider how the individual applies the new skills to their job (transferable skills).

4.13 Evaluation

The evaluation process mentioned seeks to answer the question of whether the training objectives have been achieved. There are many approaches to considering how to evaluate training (Kirkpatrick 1996; Rae 1997; Bee & Bee

1994; Philips & Stone 2002) but regardless of the formulation of approaches there are common factors to be considered. Firstly, training situated within the workplace can be difficult for the trainee to manage themselves. There can be an added cost of equipment such as the ICT equipment required to undertake training may not be readily available for training and so the employer may need to purchase equipment³. However, one of the fundamental problems of the training programmes that SMEs embark upon, is there is little or no consideration in how new skills acquired relate to work activities and practices. How can I adapt what I have learnt and apply to my job? Many SMEs expectation of training is that new skills acquired have an automatic application to business activities, this may not be the case. Evaluation of training activities allows for both the employer and employee to consider the value of the training and how it can be used within work practices. This activity takes place commonly in larger organisations and not always with SMEs, where time constraints impinge on this process (Carey 2000). Jacobs (2003) argues that off the job training (externally organised and delivered training) tends not to deliver the objectives the SME envisage. This form of training fails to respond to the business needs and schedules. Thus, fail to have an impact upon employee performance. S-OJT also does not fully consider the adoption of training in working practices.

It is important that to evaluate the context to find the fit with the new level of understanding in order to make it usable. Kirkpatrick's (1996) model, popular with larger organisations particularly commercial applications, provides a more comprehensive approach to evaluation by focusing on four levels: reaction of student; learning; behaviour and results. The goal of is for organisations' training and learning evaluation result in well planned and well managed programmes according. The model elicits the results through four primary questions:

- Did they like it?
- Did they learn?
- Did they use it?

³ There are many local initiatives such as Cawskills Phase Two where subsidised funding can be provided for the purposes of training (J. van Zolingen *et al.* 2000; Samra 2002).

- Did it impact the bottom line?

Since its original publication a fifth level has been introduced – Return on Investment (ROI) (Philips & Stone 2002). As considered earlier through Phillips and Phillips work (2002), the need to quantify the investment level by the organisation is important in order to assess the value of the asset. Practicality of evaluation approaches needs to be considered in the context of SMEs. Larger organisations have the process management and time to consider a formalisation for training evaluation. This process stage can not be applied in the same manner for SMEs. The model for evaluation must consider the same barriers for training during the evaluation stage. Having considered the problems and barriers SMEs experience and in light of their constraints it is important to use a model for training which will encompass all these factors but at the same time is adaptive to the everyday operations of the business.

4.14 User Training Requirements Prioritisation

Change is inevitable in today's business environment, and change management, a process enabling SMEs to adapt in the light of competition and globalisation. It has been argued, that through training and learning employees can be helped to make informed decisions relating to the direction of the business, work practices and procedures. However, willingness for change does not always come easily. The culture of an organisation can prevent employees wanting to change attitudes towards training. Similarly, the introduction of new systems would involve the user as part of the development process to achieve user ownership (Pressman 1997). Employee involvement would help in promoting ownership and motivation and reduce reluctance to changes and promote the acceptance by the employee to undertake the training. This is not a task that can be successfully achieved by the employer alone but requires strong collaboration with employees.

To help in prioritisation a useful technique to use is MOSCoW ('Must Have, Should Have, Could Have Won't Have' (Howard 1997; Ash 2007). Its' development is attributed to Dynamic Systems Development Methodology (DSDM), a management and control framework for rapid application development. The most important training requirements, the 'Must have' would be the requirements for which training must be sought immediately as these are fundamental to business success. This process should be carried out on a timely basis and be informed by previous training evaluation activities. However, it is important to note that the training requirements identified need to be linked to the SME's strategic direction.

4.15 Reflections

The aim of this research is the development of a training model that when utilised by SMEs allows for the delivery of in house training. To begin developing the Preliminary model findings from chapters three and four need to be brought together. By reflecting on these findings will allows important and predominate issues to come to the forefront and integrate into the design. As already stated in the previous chapter the focus is upon Manufacturing SMEs to understand the process of training for a SME and to test preliminary model. The final model needs will be such that it can be utilised by SMEs regardless of industry.

At present two perspectives to training are considered, the Individual (Employee) and Organisation (Business). The two perspectives need to be brought together as the training programme is developed. Without considering both could risk developing a training programme that is either irrelevant to the business aim, does not fit into the business culture, is beyond the employees comprehension or not relevant to the employees job. The model below (Figure 8) shows the Learning Foundation. The Learning Foundation is the establishing an environment for training. This can only be achieved when financial implications (training budget) is determined, a clear strategy of business (business plan) documented and assessment of current training requirements has taken place to enable the business strategy to be achieved. During this process, employees should be involved, to aid in Change Management and cultural acceptance.

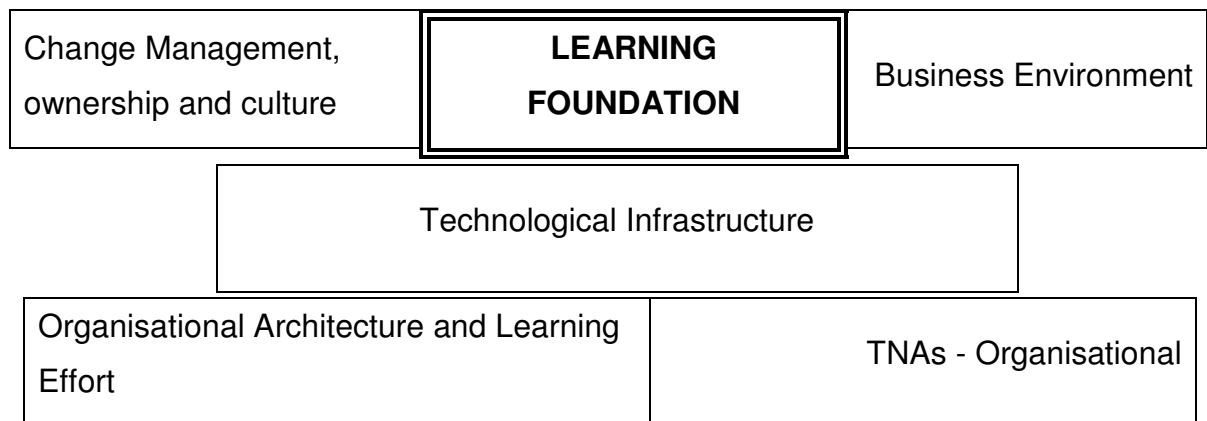


Figure 8: Stage One Preliminary Design

In order for employees to train within the workplace access needs to provided to the technology that will provide the platform to training. This requires careful consideration by the employer because of the financial implications if the technology is not already present.

This above model is only the first step toward the development of the preliminary model. The following chapter and its emerging findings will provide the next step in this developmental process.

4.16 Conclusion

This chapter highlights the commitment SMEs require for successful training. At the moment, this need does not have the level of relevant provision readily available for upskilling. Specific training for the SME that addresses the operational demands present, and fulfilled by the little resource that may be available, are simply not present for SMEs either through public or private initiatives.

SMEs commitment needs to emanate from the employer to the employee. There is a presence of recognition for the need for training where political (competitiveness agenda) and economical factors stands in SMEs path. Though the drive for training fuels better productivity and operational effectiveness, there is a need for SMEs to fit it into day to day work demands. Therefore, the training

delivered must be flexible and Just In Time and centred on work practices. It is not simply a question of acquiring a set of technical skills, but a case of reviewing and learning from experience. The view of S-OJT needs to be extended within manufacturing, training needs to arise from action and problem solving within the work environment, and thus is centred on live projects and challenges to individuals and SMEs. This makes the training meaningful, relevant and just in time. The creation of knowledge should not be an individualistic task but a collective activity, one in which employers and employees alike exchange ideas, share problems and solutions (Wyer 2000).

The increase acquisition and use of ICT within manufacturing needs to be a training priority. In order to conduct your job effectively you need to make sure you are able to utilise the tools of the job. SMEs' customers, competitors and suppliers alike, use ICT in their operations and communication. This push in the supply chain and market for the use of ICT is felt by many, if not all within manufacturing. The drive for training in this area is imperative in order for SMEs to sustain and grow competitively to meet the demands of globalisation. ICT is not the only area SMEs within manufacturing require training for but, it is a reoccurring training requirement for many. The potential of ICT for SMEs should not be restricted to emailing and obtaining information. However, this restriction will remain in place until SMEs learn how to use the tools of the trade to their full extent.

The importance of training is acknowledged by SMEs, however, the training provision available is much criticised as lacking quality and relevance to SMEs. Training programmes need a theoretical underpinning. Pedagogic principles that underpinned teaching in the classroom demonstrate the teacher has thought about the individual learner and their approaches to understanding. Andragogy relates to how adults learn (Knowles 1990) needs to be embedded in training programmes for employees. This will help to ensure the delivery of training will be of high quality, optimal learning can be achieved and within the parameters of SMEs' business (Samra 2000). Learning theory is more relevant today than ever. Swanson argues that the

... idea of workplace learning is so important today, that knowing how to make it happen most effective is critical. And with the increased interest in training has come a great confusion between knowledge and expertise. Training is about creating expertise, not simply pouring knowledge into people. That difference is why learning and performance theories are so important (Zemke 2002:87).

Receiving information cannot be equated to learning. Therefore, training needs to be both structured and informed in order for it to be a mechanism for learning. Businesses who report difficulties in recruitment and skills gap need to start to look inward in up-skilling rather than outward to recruitment. Investment in training employees does have a return on Investment in the shape of better productivity, staff retention, and motivation (Fielding 2001). The continuous down turn in manufacturing will remain until UK SMEs are in a position to rival the international manufacturing industry. SMEs need to ensure they have an employee with transferable skills, as operations change to meet the demands of business so to must the need for skills to be readily available to enable them to adapt to the environment.

The next chapter takes the need for training a step further by focusing on the use of technology, specifically the Internet and its application. The chapter explores the array of current e-learning models with a view of extracting one for use within the training process along with the application of Structured On the Job training.

CHAPTER 5 E-LEARNING

5.1 Introduction

In the previous chapter the value that training has within a business and the vital role it plays within Manufacturing, was discussed. The use of Structured-On The Job (S-OJT) training was considered, to be of great value as an approach that has the flexibility to fit into the operational demands of the SME.

This chapter explores the use of online learning for training. It focuses on the instructional principles that need to be applied to optimise the training experience. It explores the motivation for adopting e-learning, current e-learning models, how to integrate S-OJT with online learning, and constraints and challenges related to development of training programs using a hybrid model. The chapter seeks to present a revised training model based on findings from this chapter.

Towards the end of the twentieth century the Internet and particularly the World Wide Web, grew to become a sophisticated communication network. The Internet is evolving and fast becoming an effective place to do business (through e-commerce applications) because of its ease of use, low associated costs and wide accessibility. Correlating with these developments are advances in computer and network speed, and storage. However, the World Wide Web is seen as a tool that can be used to deliver learning events. Placing learning material on the Internet allows for savings to be made in resources, time and referencing of materials for future use. Using the Internet enables the delivery to be independent of the platform, hence allowing greater accessibility to a knowledge based economy.

Information is everywhere and the use of communications technology used on a daily basis in business, along with popularity in its adoption within education are driving the need for e-learning and at the same time creating the means to accomplish it (Laurillard, 2002; Salmon 2001). When the Internet was first identified by educational establishments as a resource to be utilised for teaching purposes, early adoption resulted in the dissemination of teaching material in static form. This has now moved, with developments in Virtual Learning environments

(VLS) such as WebCT and Blackboard, Computer Supported Collaborative learning (CSCL), Computer Supported Cooperative Working (CSCW) Portals and Personal Learning Environments (PLEs).

The need for training in every industrial sector is imperative to equip companies for a sustained competitive advantage (Pedler, Boydell and Burgoyne 1998). In the light of globalisation, the Manufacturing industry now acknowledges the need for training (Khan, Bali & Wickramasinghe 2007). However, with a 'myopic' view of strategy, operational demands and resource constraints, the ability to take on board the level of training evident in larger organisations, puts SMEs at a tremendous disadvantage (Mazzarol, 2004:1). SMEs need for well Structured On The job Training (S-OJT) that is timely, specific to the immediate needs and delivered right to the employee has given rise to the potential of online training. The development has allowed for a more dynamic interaction between the learner and trainer in parallel to using and exploiting a wealth of information available for research, development and the dissemination of information. The need for on-demand, high quality instruction with good support services have prompted education and training providers alike to develop efficient and effective learning systems (Beaver & Hutchings 2005). Khan (2001:75) states that there is demand for "affordable, efficient, easily accessible, open, flexible, well-designed, learner-centred, distributed, and facilitated learning environments". Online learning environments need to provide more than simply access to learning materials, it should provide learners with an avenue to reflect upon and integrate new knowledge into their current understanding of concepts, and potential for collaborative study (Littlejohn 2005; Littlejohn *et al.* 1999).

5.2 Methodology

There is an extensive array of information on E-Learning. In order to explore this information thoroughly, it is vital for the correct research approach to be utilised. The use of a qualitative research approach in this topic area provides an in-depth and thorough appreciation of what is E-Learning and its application within Manufacturing.

The model extract below (Figure 9) has been taken from section 2.3 (

Figure 3).

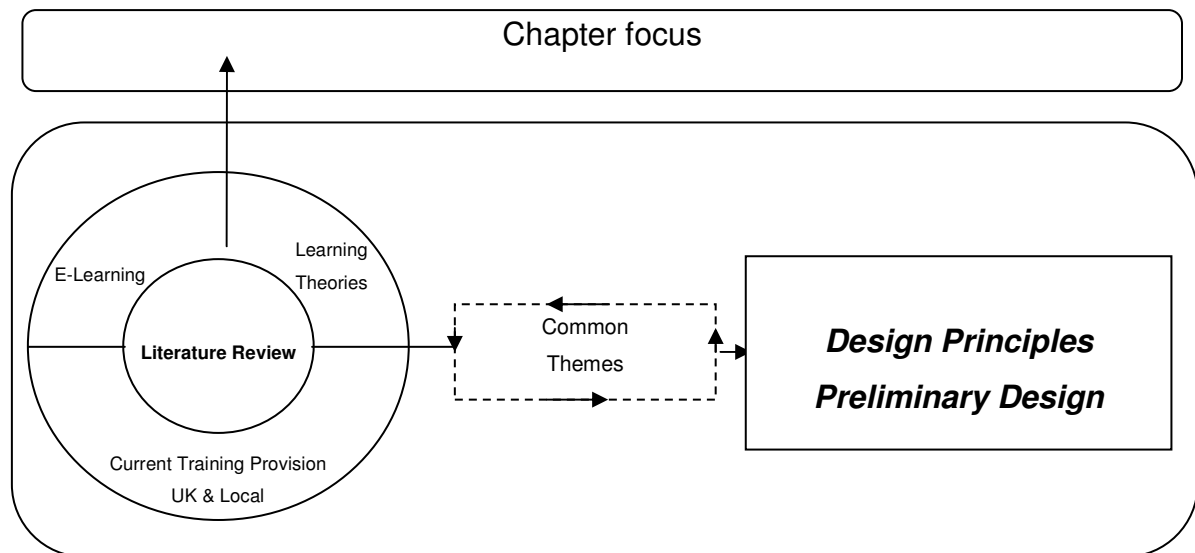


Figure 9: Chapter 5, Research Design

The qualitative philosophy combined with Induction will be used together to analyse the data collected. As with an inductive position, the research will seek to build up a model that is grounded in data. Initial data collection will be concerned with establishing an understanding of what is E-Learning and the views of academics and trainers in its application, trends and future. An important aspect to research in this area would be to understand what training models currently exist, their application and analyse their use. These elements would be vital in shaping the design of the training model in this research.

As with previous chapters, findings from this chapter will be evaluated through reflection to determine which are the common issues that should be considered as part of the preliminary design for training. The 'Common Theme' is a process of reflection that aims to draw together those elements deemed necessary in the training model design. Reflections on section 5.9, documents the elements of this chapter, which are considered vital in shaping the training. The reflections of this chapter also provides the first glimpse of the preliminary design.

5.3 What Is E-Learning?

Rosenberg defines e-learning as (2001:28)

... the use of the Internet technologies to deliver a broad array of solutions that enhance knowledge and performance.

This is based on three fundamental criteria:

- 1) E-learning is networked, which makes it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information.
- 2) It is delivered to the end user via a computer using standard Internet technology.
- 3) It focuses on the broadest view of learning - learning solutions that go beyond the traditional paradigms of training (2001:28).

Movement in e-learning started with training programmes being delivered using video recordings and delivered on VHS's and CD-ROMs. This quickly evolved with information being disseminated over the Internet. By making learning material available to learners enabled them to undertake distance learning courses. This static form of learning has again evolved with developments in VLS and network or collaborative learning paradigms. By developing virtual classes learners are able to communicate with other learners as well as the tutor (Koshmann 1996), CSCL was borne from the creation of virtual learning groups. Advances in computer network technology and improvements in bandwidth have ushered capabilities for unlimited multimedia access. The nature of Web Based Learning (WBL) makes it a flexible medium, allowing learners the option of undertaking training wherever and whenever, fostering a learner centred approach (Jolliffe, Ritter & Stevens 2001), learners are more actively involved in the learning process primarily as the learning is linked to the work role.

One of the difficulties associated with defining e-learning is that the technologies that enable it are continually changing. "...e-learning is commonly taken to mean the use of computer and the internet for learning" (Littlejohn & Pegler 2007:16). E-learning is a particular subset of distance learning and online or web based learning (WBL) or training (WBT). Figure 10 illustrates these subsets.

Figure 10: Subsets Of Distance Learning (Urdan & Weggan 2000:9)

E-learning has varying levels of media incorporation, which allows for "evaluation, adaptation, and remediation", independent of the computer platform (Technologies for Training 2000). It is a process by which some or all aspects of a training programme are delivered over the Internet or an Intranet (Wagner 2000). SmartLearn (2000) summarises the drivers of e-learning as:

- an economy evolving to a knowledge-based economy;
- a paradigm shift in the way education is viewed and delivered;
- one with knowledge gaps demanding educational system reform;
- globalisation of business is resulting in manifold challenges;
- social and demographic changes direct education towards older target groups;
- learning as a continual process rather than a distinct event;
- explosive growth of the Internet providing the vehicle for education.
- need for flexibility in the workplace.

Movement towards a knowledge-based economy, as highlighted in chapter three, is driving the need for businesses to equip themselves with a workforce who have and can apply their skills as and when the business needs it to meet market changes.

5.4 Online Learning

Online Learning or WBL encompasses educational applications and delivery over the Internet. It is an innovative approach to distance learning, in which e-learning is transformed by the technologies and methodologies of the Internet. WBL or training presents live content, in a structure allowing for self-directed, self-paced, flexible instruction in many topics with the added convenience of fast access to learning from multiple locations. In support of this Jolliffe, Ritter and Stevens define it

... as the delivery of and access to a co-ordinated collection of learning materials over an electronic medium using a web server to deliver the material (2001:8):

They state WBL has one key difference from classroom based learning and that is it is self paced learning, “learner-centred role” (2001:7). Online learning connotes a wide range of business activities and technologies, including distance education, WBT, courseware delivery and online testing. For the purpose of this report the term ‘online learning’ refers to the ‘use of Internet and World Wide Web technologies, used to deliver some or all aspects of a training programme’.

Online learning takes place in a Synchronous and Asynchronous environment (Jolliffe, Ritter & Stevens 2001). Synchronous relates to real time, instructor led online learning with the presence of live broadcasts of lectures. It is where all trainees are logged on at the same time and communicate directly with one another within a virtual classroom. In asynchronous learning, trainees cannot communicate directly with one another in real time. The courses are much more self paced and are supported through mentoring. Trainees are able to communicate, but with a time delay, e.g. email or discussion groups. As highlighted in the previous chapter, time is one of the main factors affecting SMEs ability to take up training, because of this Asynchronous learning was deemed

most appropriate. SMEs will be able to take self-directed and self-paced training programmes, at the same time, exploiting the same technological medium, the Internet, and be supported through mentoring. Self-paced learning would help to reduce the time taken to deliver training, which has cost benefits (Littlejohn & Pegler 2007) for SMEs and provides advantage to the business competition through process improvement.

5.5 Current Provision

Many online training programmes can be described simply as collections of information with little structure. If properly developed they have the potential to be much more. Well designed, structured web pages and training can guide learners through a variety of learning experiences, strengthen their understanding, and optimise learning for the individual by producing a learning environment that caters for the individual learning requirements and learning styles. To facilitate the development of a flexible set of learning processes, there is a need to move away teacher orientation or traditional approaches of instructional design (Jolliffe, Ritter & Stevens 2001:20; Stephenson 2001:16). Also, minimising the extent to which instructional material obstructs learning and focus the design on activities that supports learner directed activity and accomplishments (Carroll 1997).

The growth of information that characterises modern businesses makes the need for learning more important than ever. The volume of what one must learn and understand and the speed at which they must learn can be difficult. Much of the literature relating to e-learning, states that old models of learning acquisition are failing (Rosenberg 2001; Stephenson 2001). Many theorists are moving away from the belief that learning and training are synonymous (Rosenberg 2001; Boud 2001:34).

Training is the way instruction is conveyed; it supports learning which is our internal way of processing information into knowledge (Rosenberg 2001:4)

Information technology is changing access to knowledge as well as the process of learning and delivery of education and training. Teaching and learning can now

take place outside the traditional institution and workplace. Online learning is constantly evolving incorporating the advances in technological developments. However, technological innovations in teaching and learning have been hindered as they are designed to exploit the capabilities of the technology rather than to meet an instructional need.

Current provision in online learning is focused on exploiting technology. The over use of multimedia courseware does little to inform the learner. Hamburg & Engert (2007) identify five critical factors as to why current e-learning provision is failing SMEs.

1. Initial design issues.
2. Focus on technology and not on instructional design.
3. Lack of understanding, that specific e-learning tasks have to correspond to the existing competencies as well as the present and future work tasks of learners.
4. Issues of user- friendliness and interactivity.
5. Problems with production, distribution, long term management and evaluation of e-learning courses (ibid. 2007:190).

It has been established that training is a function of large organisations that have both the time and the resources to invest in training. Building tailored training programs delivered in-house allows them to build a platform from which employees are informed and business processes are quickly adapted to meet the needs of business in the face of competition. SMEs do not have the same level of adaptability, as the infrastructure for such activities, is not present. It is not to say the SMEs are not taking training but moreover the impact of the training taken is not making a timely impact. Once classroom based training is complete the mechanism to bring the newly acquired skills back into the business is not present. The necessary level of process change of SMEs, as seen with larger organisations, is not always present. The fast changing work environment typically associated with SMEs cannot be support by classroom-based training.

5.6 Online Training As A Strategic Tool For SMEs

Knowledge management provides organisations with an essential source of competitive advantage in the information economy by capturing, storing, and making accessible its full array of intellectual assets (Wagner 2000), knowledge which can be facilitated through timely and well designed training. The Commission on Technology and Adult Learning (ASTD/NGA 2001) focused on how e-learning impacted on adults. It spoke of 'technology enabled learning designed to increase workers' knowledge and skills so that they can be more productive, find and keep high quality jobs, advance in their careers, and have a positive impact on the success of their employees, their families and their communities.

The acquisition of IT technology within the workplace and its prevalence at home is fuelling the need to skills to use these technologies (Wagner 2000; Weggan 2000; Littlejohn & Pegler 2007).

While the use of computers and networks to deliver learning in an organisation is not new, the ubiquitous access provided by web networks is accelerating the adoption of this important information transfer. (Brogan 1999:13)

Utilisation of technology already in place requires tailoring to bring about a fit with working practices. Larger organisations have the time and resources available to produce and deliver bespoke training for their employees. This level of investment cannot be mirrored by SMEs because of limited resources and inflexibility in multi skilling. Essentially, they must do more with less (Desouza & Awazu 2006). Using training vendors is seen as a method whereby the skills gap in existence can be somewhat addressed. However, taking time away from work reduces the desirability of taking such training. The ability to learn at the desktop enables the SME to exploit technologies that are already present in the workplace without the need for additional expenses such as travel costs. The employee has the opportunity to train within the workplace (provided the technology is available) and during work hours. Using an online learning system, the SME can create a

...virtual campus in which learners, instructors, subject matter experts, training managers, and line managers can take training, develop and manage online instruction, collaborate and access reports on learner progress (Brogan 1999:13).

Movements toward a knowledge-based economy will enable businesses to sustain competitive advantage in the light of globalisation. The shift towards a knowledge-based economy has serious implications in the way education is viewed and delivered and the role e-learning has in reducing knowledge gaps (Urdan & Weggan 2000). Shortening product cycles, increasing competition and globalisation, technological advancement and reliance have led movements towards a knowledge based economy. However, this has given rise to a lack of skilled personnel. The accessibility of courses via intranets and the Internet requires self-paced training and is 'anytime anyplace' availability that reduces the cost of training and gives rise to strategic advantage for SMEs (Jacobs 2003). Situated learning is intended to allow the learner to execute tasks and solve problems in an environment which reveals the various intended uses of the knowledge (Brown, Collins & Duguid 1989).

To help determine whether an organisation should adopt e-learning Terri Anderson (Anderson 2002) specified a set of questions related to five critical e-learning success factors. These factors are known as the five C's:

- Culture - assessing or evaluating corporate culture and readiness for e-learning;
- Content – of programmes;
- Capabilities - internal or infrastructure;
- Cost - options of the initiatives and the targeted;
- Clients or employees.

These factors are considered to help organisations acknowledge and address a wide range of e-learning issues confronting them. Transiting from instructor led to online learning can be a major change in operations. As discussed in chapter four, SMEs need to ensure they have an infrastructure in place to identify appropriate training for the SME that can be supported by this very infrastructure. Consideration for Business Strategic Plan (BSP), Human Resource plan (HRP), Training Budget and a Training plan leads to the ability to address the five C's. Employees involved in this change process, by its very nature, become

stakeholders of the system and as such are more accepting of new methods or processes.

As discussed in chapter four, training requirements of SMEs can vary from IT to Management skills, but moreover, ICT skills was the area where much of the training was sought. The nature of online learning requires a level of IT competence from the trainee (Sloman & Rolph 2003). The increased acquisition in IT has left in a skills gap in business. Furthermore, the need for IT training that is fundamental to the success of business is being addressed through the very medium that it places onus upon. This double-edged sword presents many problems namely difficulties in using the technology, which can bring about low self-esteem and a lack of motivation. MacDonald (2001) argued for the positive potential of computer based learning interaction.

On-line learning provides an opportunity to have the best of both worlds - learning which is freed from the constraints of attendance yet provides the level of interaction and opportunity for co-operation that has only previously been possible in the classroom... More importantly, however, is how electronic access to learners can be used effectively to make learning, interaction with others and resources available in a manner and format that doesn't make it 'second best' to its more traditional counterpart (MacDonald 2001:21).

This freedom of location that is part of online learning has huge implications for SMEs. Jolliffe, Ritter and Stevens (2001) state there is increase learner accessibility, platform independence, increase learner effectiveness, Internet resource support, changing nature of knowledge, increased competition and overall less expensive and convenient form of training, as reasons why WBL should be utilised for training. Though the list is not exhaustive, it does provide insight into why online gives better advantage to SMEs, who with their lack of resources and time, need to be able to use technology already in place and take training regardless of location. Using online learning is more cost effective overall than customised solutions as there is limited technology and software acquisition costs (Littlejohn & Pegler 2007).

Fulfilling training requirements using classroom based training can be both costly and would need much coordination to, for example, arrange cover for trainees away from their job. The presence of readily available training material (at the

desktop), would go towards reducing the overall delivery time. Thus, the learner is able to control time for training achieving a better fit between taking training and continuing with work demands. In addition, the platform can be home to a much wider range of training content making it both broader and accessible to varying needs evident in businesses. Online training can be tailored to the needs of businesses by supporting the business infrastructure.

Online learning reduces the costs of travel and other overhead costs. This clearly has essential benefits for SMEs where reduction in training costs is vital, particularly, in situations where there are limited allocations of resources. Burke (2000) believes that e-learning levels the playing field by providing greater access to employee training and education, which is perhaps the most critical component of business performance. Information technology plays a major role in education in the form of computer based learning systems. As a result of the pervasiveness of computers in the workplace, teaching people to use computers has become a major category of training as illustrated in chapter three (Brown 2001). It must be noted that training online is not simply restricted to training within the workplace. With the placement of learning content on the Internet, accessibility can be from anywhere, where there is Internet access.

There have been several stages to the development of e-learning and online learning. Clearly, even today the teacher who simply places their teaching material on the Internet is not theory based driven but technologically driven (Laurillard 1993). Making a presence on the Internet for the sake of utilisation, to ensure one is on the band wagon, has been prevalent. There is a need for achieving learning outcomes focused by instructional design rather than an empty use of technology. Laurillard (2002) emphasised the need to underpin technological change with pedagogical knowledge, understanding and justification i.e. putting the student at the centre of learning.

The use of online learning allows for a learner centred delivery strategy that can take into account the many differences between learners' learning style. It has the ability to simultaneously reach an unlimited number of employees for training. However, bandwidth restriction can result in long download time for large files

particularly with a multimedia rich courseware. Reliability of Internet Service provider (ISP) can render the Internet non-operational at times, which in turn can prevent access, leading to a loss of training time. SMEs due the size of the business are not likely to have a significantly large number of desktop computers that are linked to a high-speed connection. High-speed (broadband) connection is important where there is multiple media such as texts, graphics, audio, video and animation as part of the learning materials. One of the biggest problems associated with online learning is linked to its dependency on the information technology. Limited bandwidth creates problems when downloading graphic intense materials, though the popularity of broadband has gone some way to alleviate bandwidth problems. Towards the end of 2007, it was reported that nearly nine out ten connections to the Internet are now via broadband (National Statistics 2007b). In addition, the need for an up to date browser only adds to the cost of technology necessary to utilise online learning.

Taking into consideration the constraints and characteristics of the SMEs, the failures of current provision and the barriers presented by online learning, “mass customization” (Hamburg & Engert 2007:191) provides a possibility. The approach breaks down e-learning solutions into modular provision. The learning content is deconstructed and reproduced to provide learning units. This has many benefits for SMEs firstly as it eliminates the need for designing learning content for the training programme. The modularisation will help to break down learning content into manageable units of information so as to allow learner to train in specific areas rather than having to work from the beginning to reach a specific target area. This method is cost effective as you are not redesigning content but simply utilising content that is specific to the individual's and SMEs' needs. The reduction of content into manageable unit will also help to reduce the bandwidth problems associated with multimedia courseware.

By breaking down learning content already designed by vendors into manageable chunks, encapsulates JIT learning. The learner will be able to go into a specific unit, whether it is for training or a reference and quickly returns to work activities. However, this needs careful consideration to ensure that by breaking down into units, key information is not lost. Clear links between each of the units through

learning outcomes that are associated with the business strategy goes some way to ensure that learning units better structured into manageable chunks and at the same time are relevant to the business. We will return to this issue and the instructional design implications later in this chapter.

5.6.1 Characteristics Of An Online Learner

In chapter three, we found that the need for training and multi skilling is high in manufacturing because of globalisation and growing competition. The average age of an employee was over 40 years. Dabbagh (2007) states that the Generation Xers (those born 1960-1980) currently make up online learners. The Xers unlike the Nexter (those born 1980-2000) have not grown up amidst a technological revolution (the Internet) (2007:219). The acceptance level of the Xers, of training online is laced with confusion, doubt and scepticism. Therefore, the characteristics of current online learners must not be confused with those of a Nexter. Dabbagh summarises the following characteristics of online learners to be critical to the success of an online learner. A learner

- has a strong academic self-concept;
- exhibits fluency in the use of online learning technologies;
- possesses interpersonal and communication skills;
- has an understanding of and valuing interaction and collaborative learning;
- possesses an internal focus of control;
- exhibits self-directed learning skills;
- and exhibits a need for affiliation (2007:220).

It is difficult to see how many manufacturing SMEs or even SMEs in general who have not undertaken any form of online learning to have a 'strong academic self concept'. Fuller *et al.* (2005) adds that

...people with higher levels of initial education and qualifications and who occupy more senior positions in the workforce have disproportionately more opportunities to participate in formal training events (Fuller *et al.* 2005:2).

People who do not have a 'strong academic self concept' are less likely to have had training opportunities. Those employees who do enter online training do so with a level of uncertainty, doubt and confusion as to how the training will work and whether they will be able to manage themselves. This is further complicated by individual's ability to use the technology and work demands. As discussed in the previous chapter, many employees made redundant from Rover sought to retrain. The training provided came from many avenues one of which was LearnDirect. Training with LearnDirect is based online, if you seek training, in for example, the European Driving Licence (ECDL), then learning about Email and Internet are clearly elements. The knowledge and understanding of online learning technologies is not at the level Dabbagh expects, nonetheless, online learners who are able to use IT technologies to some extent, continue to learn to use the technologies as part of the training process. Overtime, there is evidence of growing confidence in using online learning technologies and communication skills. This in turn develops an online learner, whose characteristics resemble those highlighted by Dabbagh. Though these traits can appear non – existent at first, they are important traits which distinguish successful online learners that can be used as metrics in a training portal (Eboueya, Uden 2007).

5.7 Online Learning Models

Dabbagh & Bannan-Ritland (2005) state online learning models fall in two remits: Exploratory and Dialogical. Exploratory models are based on the

... theoretical construct of discovery or inquiry-based learning, in which learners are provided with a scientific-like inquiry or authentic problem in a given content area and asked to generate a hypothesis, gather relevant information using a variety of resources, and provide solutions, action plans, recommendations, and interpretations of the situations (Dabbagh & Bannan-Ritland 2005). [For example, situated learning and problem based learning]

Dialogical models

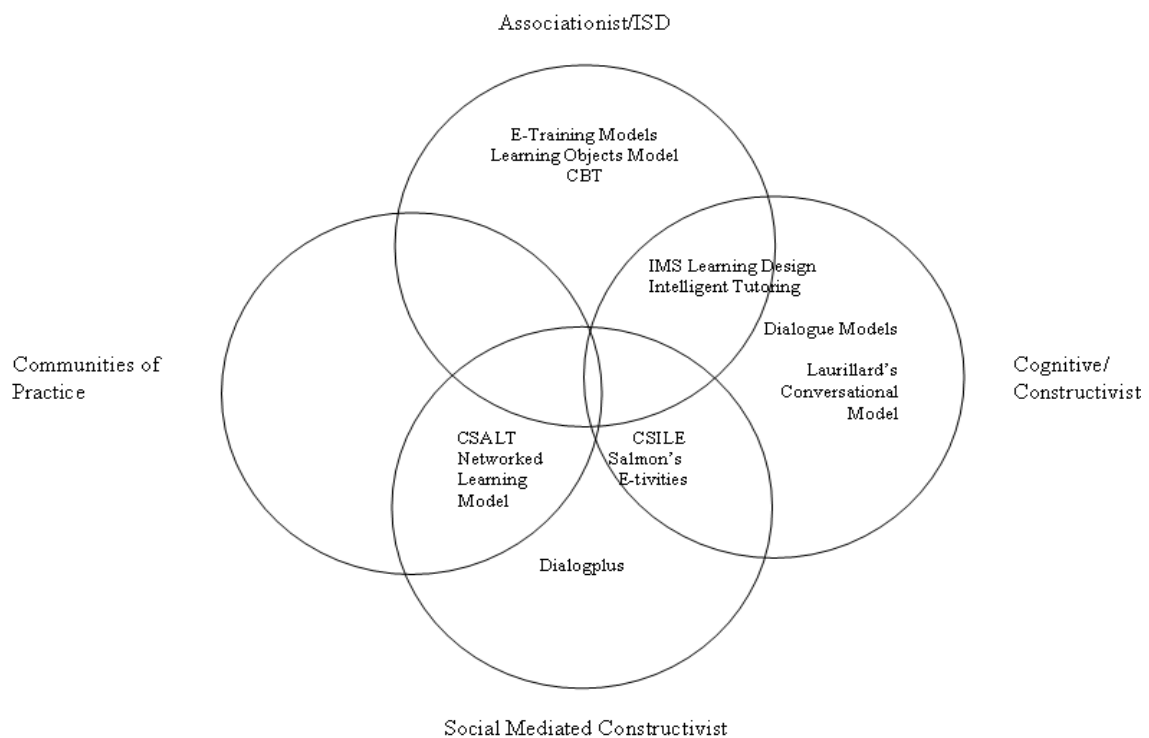
...emphasize social interaction through dialogue and conversation. The idea is to assist learners in constructing new knowledge primarily through dialogue as a form of interaction (Dabbagh & Bannan-Ritland 2005). [For example learning communities and communities of practice].

It is important that course designers focus on designing online learning environments that support both exploratory and dialogical learning. They engage learners in collaborative, reflective, self directed and paced activities. The role of the technology in online learning is to reach out to remote learners and put them in a favourable position to learn. The use of models or frameworks is to provide a good pedagogical framework, to optimise the learning experience. Mayes and de Freitas take a step further by stating there are three clusters of e-learning models: Associationists/Empiricist Perspective (ISD) - learning through an activity, objective orientated, Cognitive/Constructivist - learning to achieve an understanding; autonomous learning; and Socially Mediated Constructivist (Situative) - learning as a social practice, formulating and solving realistic problems (Mayes & de Freitas 2004). Communities of practice, (a form of a dialogical model) which can be seen as part of Situative perspective is three fold. They are:

- Social Anthropological - Shared practices, Expertise community, Continuing Professional Development;
- Learning Group –Computer mediated communication (discussion group), tutorial group, year group;
- Individual relationships – social meditation.

Online learners can be grouped into those with similar learning needs. The focus of a problem scenario presents a topic of conversation within the discussion forum that can lead to the establishment of shared practices (Lave & Wenger 1991). Arguably, this is the rise of a learning group, however, employees who seek JIT training have a problem based perspective. The employee has a problem, training would be sought to resolve the problem, the knowledge and understanding would be then be applied to the problem scenario to seek a solution to achieve a new level of knowledge and understanding. Support from skilled practitioners can inform the novice learner to resolve their own problem in their work practices, particularly when the problem is to do with technology. The new practices can then be disseminated throughout the organisation if the change of practice is effective. This cyclic inventiveness (Wenger *et al.* 2005) whereby learners becomes active participants in a community of learners and where technology can

have a tremendous influence, can be a very effective approach supporting the associative and cognitive perspective. However, the effectiveness requires much



reflection and evaluation of current working practices to ensure that the new method(s) are effective for the business.

Figure 11: Taxonomy Of E-learning Models (Mayes & de Freitas 2004:25)

Mayes & de Freitas (2004) present a model (Figure 11) to illustrate how each e-learning model fits the clusters mentioned earlier. Though, this is not a complete evaluation of e-learning models, it does provide a board spectrum of current models used in training and in Higher Education. Also, the absence of models purely on the Communities Of Practice side highlights the board aspect of this evaluation.

It is interesting to see that there is no model that is a blend of all three clusters. Each model identified, is particularly oriented to a given cluster and little providing a blend and attention to a community of practice. Socially Mediated Constructivist (Situative) is learning as a social practice, formulating and solving realistic

problems, this cluster of models would be ideal for SMEs however they need to be provided with training that is grounded by their context.

The e-learning model to be used as a framework for delivering training to SMEs needs to be aligned to the business strategy and situated in direct experience. Laurillard's Conversational Framework (1993; 2002) focuses on academic learning mediated through conversations between the teacher and the learner and not based on situated learning. This would make the application of concepts very difficult for the learner. Goodyear's Network Learning (Goodyear *et al.* 2001) model gives too much focus on tasks and activities and provides little in conceptualisation. However, this model has strong CoP onus, which does allow for knowledge sharing. The level of group work involved does not facilitate self-paced learning or JIT learning.

The required model needs to be able to provide self-directed and self-paced learning. It needs to be supportive of not only the learning needs of the individual but of work-based practices. It needs to allow for reflection and development of the learners own situated learning and it needs to be modular to allow for self-paced and JIT training. The required model needs to enable the learner to establish themselves within the learning environment and taken forward to a point in understanding where they can take the knowledge acquired and construct and apply the concepts to their own work-based practices. The link between conceptualisation and application would deem the training to be successful for the learner. Salmon's E-tivities model (Salmon 2002) has been placed overlapping between socially mediated constructivist and cognitive/constructivist. The five stage framework proposed does however, have elements of Community of Practice. The model though is not a blend of the three clusters does however address the requirements the required e-learning model needs. Figure 12: Gilly Salmon's E-tivities (Salmon 2002:11; 2001:26) illustrates the five stage framework and E-tivities.

Facilitating constructive learning (Knowles 1990) would allow for the application of concepts to work-based practices, enabling learning and training experience relevant to the business. Figure 12 illustrates how to motivate learners online to

progressively build learning through E-tivities. The training and development programme is designed to allow self paced learning. The 'interactivity bar' running alongside the model gives an idea of the intensity of interactivity that can be expected at each stage. See Appendix 3 for further information about the E-tivities model and the activities that take place at each stage.

Figure 12: Gilly Salmon's E-tivities (Salmon 2002:11; 2001:26)

The use of Salmon's model in developing the training portal will help to provide a pedagogic framework to optimise the training experience. However, the model lacks the focus in its integration with pre-designed learning content. The E-tivities are based on enhancing active and participative online learning. They are designed to extend the learning content, through online dialogue, to construct a new level of knowledge and make it applicable to the given context, in this case work-based. The role of the E-moderator is vital to help employees attain constructive and reflective practices and to apply the new knowledge to both improve and tailor work practices in the face of competition in line with business strategy. Therefore, the choice of E-moderator will need to have expertise in the

learning content, they need to have online communication skills, technical skills, understanding of the online process and the personal characteristics to manage online learning (Salmon 2001:40). Furthermore, in chapter three, we looked at S-OJT and stated the supervisor who assists in managing the training events has a key role in the training experience. By integrating S-OJT with E-tivities we can identify two key roles: A Manager/Supervisor and an E-moderator.

The two roles identified above have clear roles and responsibly in managing the training. The first the manager/supervisor would be responsible for managing the workplace training, ensuring the employee has the time and facilities in house to carry out the training and works with the employee to help integrate the knowledge and skills into work-based practices. The E-moderator on the other hand will be responsible for facilitating the virtual training experience. They would help to manage the collaborative learning online and address the technical and support issues of the online training.

As we have found, SMEs do not have the time or resources to develop training programmes and as such, outsources this function to external training vendors and off the shelf packages, with little consideration to what specific training is required, in order to make the necessary cost savings. The issue now is the how to integrate the training portal with the Salmon's model, Hamburg & Engert customisation, Dabbagh critical success factors and S-OJT.

5.7.1 Blended/Hybrid Learning

Training has traditionally been conducted face to face, with trainees going to where the trainer resides, or the Trainer going to the trainee's location, either way the trainee would be away from work.

Today we see different providers emerging in the market who can provide learning material for potential learners. Education, therefore, is now but one provider among many potential sources of learning material. (Massey 1999:4).

Littlejohn and Pegler (2007) see blended learning in terms of 'media blend' or the 'activity blend', or whether on campus (work-based) or off campus activity. For example,

...a course could be a media blend of audio and video (webcast or otherwise), and print resources or readings with face-to-face lectures. [activity blend]...is the discussion going to happen online or offline? (Littlejohn & Pegler 2007:30)

The term blended therefore implies "a seamless integration of intermingling of e-learning and conventional teaching approaches and environments" (Littlejohn & Pegler 2007:30). The process combines online learning with traditional classroom training. Online learning has a technological reliance but along with this is the understanding that this is not completely reliable. There are many conflicts between online learning and the technology used, which has been previously discussed. However, there are growing trends towards blended learning which has started to "...lessen the gap that was previously identified between instructor –led and technology based training" (Gower 2007:1).

The availability of blended training raises the expectations of businesses and puts pressure of training companies to offer training methods and activities that make their learning blended and accessible (Gower 2007:53)

Traditional forms or classroom training is an approach familiar to most. Online learning moves away from this to a virtual classroom. This shift is one which can be difficult to adjust to, particularly with the Generation Xers (Dabbagh 2007) and who have limited experience of this form of training. The virtual classroom transforms the role of trainer into a learning facilitator or e-moderator. Trainees need to become self-directed and for some this can be difficult to do. The paradigm of learning is completely different to what the trainees has been familiar to. This unfamiliarity can cause disassociation from the training and hinder the training process and an up-rise in the reluctance for training. Combs (1982) argues that for learning to be 'affective' it is important for students to have a 'sense of belonging'. Therefore, the role of the E-moderator needs to ensure that the participants are not simply lurking but are participating in the discussion and are engaged.

The issue of motivation and preventing disassociation will be explored further in the next chapter. However, based on these concerns training providers should ensure the training though it exploits the use of the Internet, is not solely dependent on it for delivery, particularly where learners are not familiar with online learning or have not trained for quite some time. Blended Learning not only utilises the Internet for virtual training, but also retains features of traditional forms of training, hence, ensuring maximum effectiveness. The primary advantage hybrid learning has is having face to face contact with both the tutor(s) and other people on the course which provides a social aspect. Learners are able to train online supported by tutors who facilitate and emphasise co-creation within a course that is rich in online collaboration. Enhancing the social collaborative working by not restricting the learner to online collaborative working but extending it in an environment which they are familiar to which would be both motivating and improve retention and reinforcement through follow up mechanism on the Internet.

In Salmon's first stage (Access and motivation), induction session, where learners are helped to familiarise themselves with the learning environment, are issued with logins and password to use the system. This method can be done virtually or face to face. The term blended learning or hybrid learning has been popularised in the past few years. During the initial start up of the training face-to-face contact would be beneficial particular for the Xers to alleviate start-up problems such as logging in. Learning support needs to be the seamless integration of physical and virtual learning spaces. This would allow for a greater flexibility to meet the different learning styles and levels of the learners.

Cheese (2003) presents a very different view on what is blended learning. Rather than looking at the delivery perspective focus on what the learner perceives blended learning to be, that blended learning is "...a continuous *process* of job experience, knowledge gathering, guidance, and counselling with reinforcement and performance feedback" (2003:16). This precept is primarily focused on the continuous blend of experiences of the learner and not necessarily with the delivery mechanism. The drivers for the continuous experiences lie in the heart of workforce performance. Cheese defines these as:

- Learn – training;
- Perform – (of task) delivering support to perform more effectively;
- Contribute/innovate - learning while contributing to organisational processes.

To understand how this view works Figure 13, demonstrates the relationship between these elements and how they inform the organisation's goal and direction.

Figure 13: Learn, Perform, Contribute/Innovate (Cheese 2003:17)

The blended learning approach here is based on workforce learning. The blend of learning and performance allows the learner to shape the organisation's alignment. The technological development must support the blend of learn-perform-innovate, which in turn can support alignment activities. In the previous chapter, we have seen evidence for the need for alignment of training with organisational activities. Building upon this premise, we can see how training activities both inform the strategic direction of the organisation and vice versa.

This model provides a valuable incorporation view of the training experience and its alignment to organisational goals. This further reinforces the role a manager/supervisor has in S-OJT in incorporating training into work-based

practices. Furthermore, the role of the E-moderator needs to assist learners to facilitate the training experience into their work-based practices.

5.7.2 Engagement And Motivation

There are a number of key factors that will affect the learner's perception of the time taken for training. Levels of interest in the topic play a significant role in attention levels. Interest levels can be achieved if the material to be learnt is tied into the experiences of the learner. Bennett argues that "tailoring the lesson to the backgrounds and needs of your audience ... is the best way to achieve this" (2007). This view is also confirmed by Knowles (1990) who states that adult learning needs to be constructive and that they should be relevant to the learners own understanding and experience. Active participation enables the learner to control the learning experience, hence holding their attention. Using different senses to receive information helps to optimise the learning experience. Degrees of interactivity enable the learners to control their participation (Bennett 2007), "Interactivity makes the difference between the systems that simply presents information and one that helps learning take place" (Jolliffe, Ritter, Stevens 2001:14).

Hamburg & Engert (2007) present three reasons for low level motivation of SMEs when training online

- learners cannot relate the online courses offered to their work tasks;
- learners are not allowed to take time out on the job for online training;
- there is insufficient support, when users are having difficulties with the learning platform and other associated technologies.

Motivation is a strong driver for the need to learn. Knowles (1988) principles of adult learning also relates to motivation, "... adults need to know they need to learn something before undertaking to learn it" (ibid.:149). Furthermore, while "...adults are responsive to some external motivators ...the most potent motivators are internal pressures (the desire for increased job satisfaction, self esteem, quality of life ...)" (ibid.:68). An employer needs to lead the need for training in an

organisation this in turn feeds to the employee who will be undertaking the training.

The culture of training in an organisation can only be present if both the employer and employee are willing to participate. Skilled employees, even if presented with superb training, will not contribute to organisational success, if they are not motivated to act in the best interests of the organisation, if they are not involved in the decision making process and given the opportunities to take action (Kaplan & Norton 1996). There are many issues in an organisation that affect motivation. These include:

- Achievement – accomplishments in work which are recognised and respected which can lead to higher status and promotion;
- Sense of Belonging – working as part of a team and having pride in their job;
- Challenges – stimulating work activities will leads to growth and development;
- Involvement – people have responsibility of task completion they have ownership of work;
- Financial reward – knowing better performance can lead to greater financial reward activities;
- Intellectual interest – personal interest in work;
- Job security – brought about through a sense of belonging and good performance;
- Work Environment - a sense of well – being in physical surrounding.

Maslow (1999) developed the Theory of Motivation and the hierarchy of needs, a theory about the needs that motivate all humans. Maslow took an optimistic approach to human behaviour that emphasised developing one's full potential. The hierarchy of needs identified five levels to achieving self-actualisation, the ultimate level of motivation. This hierarchy is usually depicted as a pyramid with five levels, ranging from the most basic needs at the bottom (satisfaction of needs i.e. hunger, thirst and shelter), to the most complex and sophisticated at the top (doing that which maximises one's potential and fulfils one's innate aspirations)

Maslow has a hierarchy of needs, from basic physical needs to higher needs of emotion and ego (Maslow 1999). Self-actualisation is the highest need and driving force of human personality, but before a person can address it, they must satisfy lower motivations like hunger, safety and belonging. Maslow considered less than one percent of the population to be self-actualised individuals. However, all human beings still possessed an innate (if unmet) need to reach this state. The implications of motivation on the design of a training programme are trainees need to be informed of the impending training and why it is necessary for them and the business. They need to understand that the training will enable them to do their job more effectively. They should be involved in the testing of the programme if this is possible. During the training, they require positive feedback by the employer who should encourage trainee participation. They need to be given the opportunities to put forward suggestions for operational improvement, whether it is within their job scope or at a strategic level. This should be done in collaboration with the supervisor/manager to ensure the change process is effective.

Kettanuarak, Ramamurthy and Haseman (2001) investigated the interaction of motivation and interactivity in an online module. They developed three versions of the same content where the degree of learner control and interaction were the variables under review. The study was limited to learning factual information, it was found that learners using the highly interactive mode reported the highest motivation. However, no significant differences were found between the low and non – interactive modes. According to Carroll (1997; 1990) not only do you need to necessitate the need to build upon prior knowledge and experience, but minimise the extent to which instructional materials obstructs learning by focusing the design on activities that support learner-directed activity and accomplishments. This can be achieved through a framework for the design of instruction by presenting the smallest possible obstacles to a user's learning effort.

Minimalist's goal is to get users started quickly on doing something useful (Carroll 1990). The theory suggests that:

- all learning tasks should be meaningful and self-contained activities with the amount of text in instruction reduced;

- learners should be given realistic projects as quickly as possible and to rely on their own reasoning;
- instruction should permit self-directed reasoning and improvising by increasing the number of active learning activities;
- training materials and activities should provide for error recognition and recovery
- and there should be a close linkage between the training and actual system.

There are clear links between Minimalism and Constructivism. It is important in a training environment, to provide clear links between what is taught and the knowledge and experience of the trainee and tying this to the organisational objectives in order for it to be meaningful to the trainee and for the training to be relevant. Moshinskie (2001) defines a model intended to improve learner motivation before, during and after online courses. The model is intended to create and explain extrinsic motivational techniques that complement the intrinsic needs of learners. Pre-course motivators in this model included providing a supportive workplace environment and adequate access, communicating and promoting the course and providing a learning portal with a customised list of possibilities. In addition, his non-instructional strategies highlighted monetary compensation as well as non-monetary compensation such as enhancements in the work setting. Moshinskie argued that it is not just the instructional designers who play a role in creating the motivational climate, but also the trainers, managers and others who can provide substantive contributions aimed at increasing employee success rates.

5.7.3 Collaborative Learning, Collaborative Working

As found in section 5.7., many models for online learning place emphasis on collaboration and or communities of practices. A community of practice is a

system of relationships between people, activities, and the world; developing with time, and in relation to other tangential and overlapping communities of practice (Lave & Wenger 1991:98).

Dabbagh (2007) places strong emphasis on the need for collaborating online and to emulate a social network that supports a community of practice (CoP) (Wenger 1998a; 1998b). Informally, there exists sharing of knowledge between employees, even though it may appear the technology drives the information flow, it is the social world or network that binds people together (Huseman & Goodman 1999; Brown & Duguid 2000b).

As corporations increasingly recognize knowledge as their most valuable resource of competitive advantage, they must devise systems for fast and efficient transfer of knowledge. It is not enough for a company to generate mountains of knowledge if it has no means of knowing what it is (Huseman & Goodman 1999:183)

Tools that allow people to share stories about their best practices and engage in collaboration and learning partnerships with other people has much advantage for SMEs. There is much evidence to support the need for CoPs or collaborative learning (Laurillard 2002:148; Wenger & Snyder 2000). A social network that supports the learner both with the online learning and working practice has enormous benefits for SMEs. As discussed earlier in this chapter, blended learning allows learners who are not comfortable with online learning environments the opportunity for a traditional approach to learning where they are in a classroom based scenario and face to face both with the trainer and other trainees. The training delivery, through a blended learning approach, is one that encapsulates two training approaches to deliver a hybrid of techniques. However, the difficulty is in mirroring the collaborative learning that is different in online and traditional environments. Quinton and English (2004) state that the Internet can aid in facilitating access to

...pedagogy rich foundation that is conducive to promoting three essential attributes of an effective learning community: active construction of knowledge; positive interpersonal relationships; and rich discursive interactivity (2004:3).

In face-to-face collaborative learning environments, learners are actively engaged in supporting each other to develop the skills required to apply higher order reasoning strategies, critical thinking, forming hypothesis, and engaging in reflective practice (Lave & Wenger 1991). Lehaney *et al.* (2004) further contends that sharing knowledge is an important way in which organisations help to reduce

the loss of knowledge from staff leaving. Designing such interaction in an online learning environment can be difficult as face to face interaction is not present. Therefore, the use of online training can only facilitate a learning community through the use of communication tools. Designing and building tools as part of the portal, for such social dynamics, can encourage knowledge construction in ways that extend learning and understanding. Furthermore, Gao states the use of information technology can “accelerate the flow of knowledge, and offer “modern” systems to stock-pile knowledge and support personal knowledge sharing” (Gao, Li & Clarke 2008:10).

Slay (1997) recommends using communication technologies to enhance online learning environments to support interaction by encompassing a variety of learning styles. The use of technologies, such as email and discussion forums fosters collaborative activities among learners (Laurillard 2002). Furthermore, the use of communications technologies as part of an online learning environment stimulates deep learning. The effectiveness of technologies in contributing to learning will be a function of how well the technology supports a particular model of learning and the appropriateness of the model to the chosen learning approach (Quinton & English 2004).

The expertise that is brought forward by learners from their experiences provides valuable learning experience to more novice learners in their own working practices. The exchange of knowledge, experience and understanding brought to the online learning environment by learners is important and must be available to other learners, whose working practices could be enhanced through information exchange (Warschauer 1997). This exchange needs to be managed much more carefully in an online than in a traditional environment where barriers such as reclusive students, experience with technology and learning styles hinder learners in socialising online.

Wenger (1998b) describes communities of practice as an evolutionary process for learning in groups in which communities of practice are ubiquitous and have always existed. They form out of necessity to accomplish tasks, providing learning

avenues, and they exist within, between, and outside defined organisations. The development of the theory is based on four major premises. Namely,

- we are social beings;
- knowledge is a matter of competence with respect to valued enterprises;
- knowing is a matter of participating in the pursuit of such enterprises, that is, of active engagement in the world;
- and our ability to experience the world and our engagement with it as meaningful, is ultimately what learning is to produce (1998b:4).

Knowledge thus, is subjective and context dependent. Learning, according to Wenger (1998b), is an ongoing process that does not stop at a certain age. Learning is inherently a process of social participation. Participation is defined as being active participants in the practices of social communities and constructing identities in relation to these communities (Wenger 1998b:4). Wenger (1998b) states that learning is situated in Communities of Practice (CoP's). CoP's are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger, McDermott, & Snyder 2002:4). Within these CoP's, learning involves:

- evolving forms of mutual engagement: Communities don't exist in the abstract, but exists because people are engaged in action which meaning they negotiate with each other (ibid.:73);
- understanding and tuning the enterprise of the CoP: The enterprise is the negotiated goal which the CoP strives to accomplish. It creates mutual accountability among participants (ibid.:78);
- and developing a (shared) repertoire, styles and discourses: The shared repertoire is a resource for negotiating meaning. It includes routines, words, tools, and way of doing things, stories, gestures, symbols, genres, actions or concepts (ibid.:82-83).

A community constantly renegotiates its meaning to keep their goal, purpose and repertoire up-to-date as well as keeping the community alive. This indicates that discussion is an important aspect of a CoP (Johnson 2001).

Interaction among learners plays a central role in the learning process (Koschmann 2001). The exchange of ideas and views through group learning can enhance the value of the learning experience. The use of online group learning or Computer Supported Collaborative Learning (CSCL) aids collective reasoning, reflection to bring about a solution. Improvement in working practices has been seen, “it drives strategy, generates new lines of business, solves problems, promote the spread of best practices, develop people’s professional skills” (Wenger & Snyder 2000:140). The use of CSCL and CoPs has many advantages for situated learning, however, Roberts and McInerney (2007) state there are problems associated with online group learning. More specifically seven problems, which are:

- student antipathy towards group work;
- the selection of the groups;
- a lack of essential group-work skills;
- the free rider;
- possible inequalities of students abilities;
- the withdrawal of group members;
- and the assessment of individuals within the groups (2007).

The prevalence of group learning depends upon the learning content. Awareness of potential helps to pre-empt solutions. Roberts and McInerney present solutions to online group learning to each of the seven problems. Employees who undertake training, and in this case JIT training, and choose CSCL, need to training that will add value to the training experience. It needs to be one of choice for the learner, which is if they choose to work as part of a group, enables them to feed the experience back into the business. By not participating on given occasions, should not mean they are free riding, withdrawing or lurking, but moreover that there is no need for it at present by the learner. A view reinforced by MacDonald (2001) who state:

...learners who choose not to contribute to group discussions may still be using the process very effectively. This is referred to as 'vicarious learning' and although the learner may not have interacted through communicating to others in the discussion, they may have benefited directly from simply observing another student's learning experience and related it to their own (MacDonald 2001:3)

CoP's cannot be formed, a business can establish a team for a particular project, which may, in time, emerge as a CoP. Furthermore, Kimble and Hildreth (2004) question whether CoPs are always suitable for the business setting, arguing that their interests may not be aligned to business objectives (2004:5). This affirms the need to ensure the selected training is aligned with business strategy and the need for learners to be supported by and to collaborate with managers/supervisors to integrate their knowledge for business process change (Brown & Duguid 2001; Roberts 2006).

5.8 Online learning And Instructional Implications

Holmes and Gardner (2006:3) state that there are a number of non-hierarchical skills and practices applied in e-learning. They are: discuss; create; analyse; collaborate; test; explore; select; search; promote; synthesise; understand and apply. These skills are used and applied in not only online learning but classroom teaching. The use of these skills will lead learners to construct their own knowledge and as a result of their experiences and interactions with others, they have the opportunity to contribute this knowledge to a communal knowledge base for the benefit of existing and new learners' (ibid.:86). They propose that a complementary and possibly new form of constructivism, 'communal constructivism', is the consequence of online collaboration.

Table 6 illustrates how these skills should be applied in online learning.

There are many parallels that can be drawn from these skills and Bloom's Taxonomy (1956). Bloom's classic work is a hierarchy, and as a hierarchy its higher levels are built on each level. The first level, knowledge, refers to the ability to remember facts, concepts, or principles, reflecting in the ability to recite information. The second level, comprehension, requires learners to understand what they know and to translate the known into their own words. The third level, application, assumes that the learner knows and understands something before using this knowledge and understanding in a unique event without being prompted to do so. The fourth level, analysis, learners break down component parts of knowledge and discuss each element. At the fifth level, they are able to recreate knowledge in their own context i.e. synthesise knowledge. Bloom's highest form of thinking, evaluation, requires learners to make judgments about something using selected criteria.

One level serves as the basis of what happens above it. The top three levels of the taxonomy require that learners know, understand, and use what they know before thinking in the higher domain. Each level in Bloom's hierarchy is more sophisticated than the previous level and requires more cognitive skill to complete. Theoretically a learner must be able to know, understand, apply, break down into component parts, and synthesise in order to properly use the intellectual skill of evaluation. However, Bloom's taxonomy raised many concerns conceptually and empirically even by Bloom himself. This work has since been updated with the work by Anderson and Krathwohl (2001). Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives was published delivering a revised Taxonomy which was supported by the findings of meta analysis of fieldwork (Figure 14).

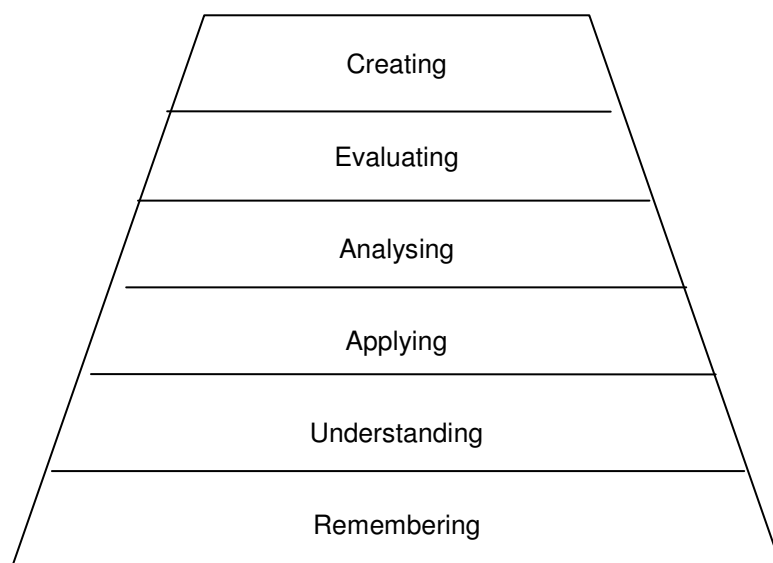


Figure 14: Anderson & Krathwohl (2001) Revised Taxonomy Of Cognition

The revised model replaces the names of some of the levels originally presented by Bloom. The new model also proposes a knowledge dimension: Factual Knowledge; Conceptual knowledge; Procedural knowledge and Metacognitive knowledge. The last level, creating has enormous implications for adult learning. It emphasises the need for learners to synthesise knowledge and understanding and arrive at the new level of understanding. The use of metacognitive knowledge

is particularly important for the reflection, evaluation and if necessary redesign of work-based practices.

In order to facilitate the skills identified online, the learning content needs to provide opportunities for the application of these skills. The ability of SMEs to develop training programs in-house is prevented by a number of issues explored earlier. However, off the shelf training does provide a lending hand. As stated in section 5.5, modularisation or the breaking down of learning content into units, permits the breaking down of learning content by objectives. Training programs produced by vendors can be customised to deliver training specific to the SMEs needs. To permit learners to undertake a specific component of training the structure of the training content is very important. Each component will lead to the achievement of specific outcomes. The customisation of content into specific units is increasing in popularity as the trend is seen as one that can fulfill their training requirements, is specific to the needs of the individual, it's an efficient way to learn in-house during the working hours and provides a way to manage the time for both work and training (Gower 2007:55). In the following chapter, the correlation between memory and attention and the use of modularisation in content development, will be explored.

Jolliffe, Ritter and Stevens (2001) argue that there are four types of materials design structures used to design WBL. They are:

- structured learning – Hierarchical;
- presentation Learning – Linear (e.g. Slide shows);
- how to Learning – process of performing a specific task;
- adaptive Learning – Displays information based on learners needs (interactivity) (2001:15).

The nature of S-OJT is embedded in problem based learning. The learner is presented with the problem scenario and they seek sufficient training to enable them to resolve the problem. As stated in the previous chapter (4.12), S-OJT presents a training model, where there is a connection between the inputs, process and organisational context to deliver an outcome, where the employee is

able to apply new knowledge gained, to the problem scenario to achieve the organisational goals.

In order to be able to design a training programme, which enables the learner to learn with the problem scenario and be able to control the information requirement, it is proposed that an additional template be developed that combines both Adaptive learning and How to Learning templates. The new template, 'Just in Time Learning', would present material on the learner's demand. Only information the learner requires will be presented and the nature of it will be problem based. Learners need to be given the opportunity to make connections with the work-based practices and see how certain problems can be resolved and then take that knowledge forward and apply it to their own work-based scenario. In addition, a referencing structure also needs to be present to exploit the wealth of information resources the Internet provides. Hyper linking learning content with quality sources outside the portal will provide alternative information about certain topics, which if the learner wants to see, is available. Essentially, when an employee has a learning requirement they would utilise the training programme, which is modularised. They would match their learning requirement to appropriate learning content and undertake the training.

To optimise the learning process, regardless of the environment, it is important to find a synergy between the learning style and the delivery format. The delivery method can be done in more than one way. For example, video images sound with or without subtitles, a feature that is controlled by the learner. SMEs as any other learners have varying learning styles. In addition, was a need for optimised delivery to save both time and cost. Tailoring the learning material and its delivery to deliver a fit between the training and learning style is an important factor for the SMEs. In chapter six, different learning styles and how the instructional design can be used to cater for these needs will be considered.

5.9 Reflections

This chapter contends that two aspects need to be considered as part of the development of the guidelines. They are the Learning Foundation and Adult Learning. It is suggested that in order to overcome the barriers associated with e-learning, a blended or hybrid learning environment is considered to be the development perspective of the guidelines. This approach will result in a training programme that is not entirely dependent upon the Internet for delivery. The unreliability of the internet coupled with the possibility of limited access for some to computers promotes the need for alternative access. The use of training events outside the workplace with face to face support will help to address some of the problems discussed. A view supported by Gilly Salmon's E-tivities model.

The use of Salmon's model in developing the training portal will help to provide a pedagogic framework to optimise the training experience. E-tivities are based on enhancing active and participative online learning. They are designed to extend the learning content, through online dialogue, to construct a new level of knowledge and make it applicable to the given context, in this case work-based. However, the model lacks the focus in its integration with pre-designed learning content. Two roles were identified to support the learners and manage online work-based training. They are manager/supervisor and E-moderator. The manager/supervisor would be responsible for managing the workplace training, ensuring the employee has the time and facilities in house to carry out the training and works with the employee to help integrate the knowledge and skills into work-based practices. The E-moderator on the other hand would be responsible for facilitating the virtual training experience. The role of the E-moderator is vital to help employees attain constructive and reflective practices and to apply the new knowledge to both improve and tailor work practices in the face of competition in line with business strategy. Therefore, the choice of E-moderator will need to have expertise in the learning content, they need to have online communication skills, technical skills, understanding of the online process and the personal characteristics to manage online learning. Both roles would help manage the collaborative learning online and address the technical and support issues of the online training. Furthermore, in chapter three, we looked at S-OJT and stated the

supervisor who assists in managing the training events has a key role in the training experience. Two key roles are identified when integrating S-OJT with E-tivities: A Manager/Supervisor and an E-moderator.

A reoccurring point found in the literature was training initiative need to be supported by the employer and the employee. A culture that accepts change and the need for training as a business function will encourage employees to undertake training readily. Involving the employees at every stage of development and implementation of the training programme will give employees ownership of the programme and are therefore less likely to reject the training.

5.10 Conclusion

As identified in Chapter three, IT is the one area in which many SMEs require training and an area that has exhibited the highest demand for online learning in recent years (Urdan & Weggan 2000:16). Many e-learning or online learning providers focus on the content rather than a blend of content, learning style, media, context constraints and support. Many SMEs who have broadband capabilities are moving towards the realisation for online learning and training. If knowledge becomes a business asset, then learning and training must be seen as a strategic initiative and a business advantage. Training providers need to be able to give a balanced programme, which can exploit the Internet for delivery, provide content, which is both timely, relevant, provide the learning support for individual and groups, facilitate learning and provide the technological support when the training fails the SMEs.

There are many problems associated with the Internet and the hardware and software used to operate it. It is important that the training programme can address this. If all training is provided via the Internet what happens if the Internet service Provider (ISP) fails or if the bandwidth is small. Video playing over the Internet will be extremely slow and frustrating for the trainee, if they are using a 56k modem to access the Internet, hence valuable SMEs time has been lost. These types of problems fall outside training support. To help address these problems the training provider would need to move away from total reliance on the

Internet for delivery and look to a blended learning approach as proposed in this chapter.

It is important SMEs consider how to manage online training events within the workplace. It is vital that appropriate support mechanism both within the workplace and online are available for learners, which are not only technical but also support learning. Support also needs to be available by line managers/supervisors and the E-moderator, as employees need to time and space to train along with learning support to deliver metacognitive knowledge into the workplace and at the same time provide the reassurance that these are value-add activities.

E-tivities are based on enhancing active and participative online learning. They are designed to extend the learning content, through online dialogue, to construct a new level of knowledge and make it applicable to the given context, in this case work-based. The use of Salmon's model in developing the training portal will help to provide a pedagogic framework to optimise the training experience. It is important to motivate employees to train online to eliminate hostility and encourage employees to complete courses. As already discussed in this chapter, one of the difficulties associated with online learning is retaining, motivating and engaging learners. This issue will be explored further in-depth in the next chapter, with inference from instructional design implications and how this can enhance the design of the portal elements to ensure those participating in training are engaged and are well motivated.

The design of WBL interface is paramount as the learning content as it helps to determine the learner's interaction with the learning content. User interface designs needs to be a seamless integration of content and its organisation along with the navigational and interactive controls that learners can control to manage the learning process. Khan (2001) argues the interface design encompasses "page and portal design, content design, navigation, and usability testing" (Khan 2001:84). Learning content needs to be customisable so as not to divert from the need to take into account how learners learn, the learning styles and how best to

customise the content in Situated Learning. These issues will be explored further in the next chapter.

CHAPTER 6 LEARNING THEORIES

6.1 Introduction

In the previous chapter, the application of Structured On The Job Training (S-OJT) and the need to integrate it with Salmon's E-tivities model was explored. The combination of which will allow for e-learning training delivery that is practical, work-based oriented and timely.

The limitations related to traditional or classroom based learning which include the fixed times and locations for learning can be overcome by e-learning. However, in order to optimise the activity of learning, it is important that to design the experience for learning with careful consideration for a synergy with ICT, individual learning needs and the business goals. As mentioned in chapter three, manufacturing is moving from production based to a service based industry where knowledge is the driver. This in turn has changed the paradigm in the way education is viewed and delivered and many businesses are realising the benefits of training their workforce as a competitive weapon, rather than a cost factor. Technology has transformed the way we live and work. The workforce has to process more information in a shorter period, they need to be reactive to business needs through the introduction of new products and services to maintain competitive advantage. This has led to shorter production cycles and life spans of products continue to shorten, leading to some information and training becoming obsolete (Urdan & Weggan 2000). The change in the environment creates knowledge gaps, which can only be filled through training.

'Just In Time' training has become a critical element to businesses and more specifically SMEs, where businesses need to make learning and working seamless (Jacob 2003). As already mentioned SMEs are faced with additional constraints including a lack of financial resourcing and operating at an operational level. Any training undertaken must be able to blend in with these constraints. Online learning can help to address these restrictions and deliver training readily available to those at the desktop at anytime.

Learning is an individualistic lifelong activity, where everyone has his or her own learning style. Some work with music in the background, others in silence on their own or groups. There are a variety of ways in which people learn and the consequent implications need to be taken into consideration when designing and implementing a training programme in the workplace. It is conceded that there is not, and probably will never be, a “Unified General Theory of Adult Learning”, which every instructor can use to solve their training development issues (Zemke 2002; Ormond 2008). However, it is important to understand that the process of learning is such that it enhances the “...adaptive capacity of an organisation – its ability to respond quickly and flexibly to changes in its operating environment” (Reynolds 2004:1).

There can be a lack of cohesion between learning theories and learning online (Samra 2000). Classroom based teaching is normally informed by learning theories (Skinner 1950). However, learning online is always informed by the same principals. The common problem is that instructors have not clearly understood how this medium would help learners to learn. Even today little thought may have been given as to how instructors can use this method, whether it is to reinforce teaching in the classroom or to deliver the training completely online. Until the objectives or targets of teaching using online means are determined, instructors will not be able to deliver learning material with full advantage to the learner (ibid.).

Instructional design considers the way learning content should be constructed. The use of IT in business is continually changing to incorporate new technologies. In addition, globalisation and increasing competition means that businesses need to have skills in-house readily available to meet new needs and demand. It is important to anticipate the integration of new content into our training provision by designing for adaptive capacity, demanded by the business environment. The question therefore is, how to design an online learning environment where the content, delivery and context are specific to the learner’s needs (ibid.). The application of learning theories in instructional design helps to embed predictable relationships between communicating content and the outcomes of learning (Driscoll & Carliner 2005).

This chapter explores the array of learning theories and their implications to instructional design. It takes Online Learning explored in the previous chapter a step forward by considering how to encapsulate Learning Theories in the development of a training programme for SMEs. The learning theories will be classified under two principles of learning: Pedagogy and Andragogy. This chapter will extract aspects of these theories and attempt to develop a set of generic guidelines to be applied when tailoring learning content.

6.2 Methodology

There is an extensive array of information related to Learning theories. In order to explore this information thoroughly, it is vital for the correct research approach to be utilised. Similarly, to the previous chapter, the use of a qualitative research approach in this topic area provides an in-depth and thorough appreciation of what is learning and associated theories.

The model extract below (Figure 15) has been taken from section 2.3 (

Figure 3).

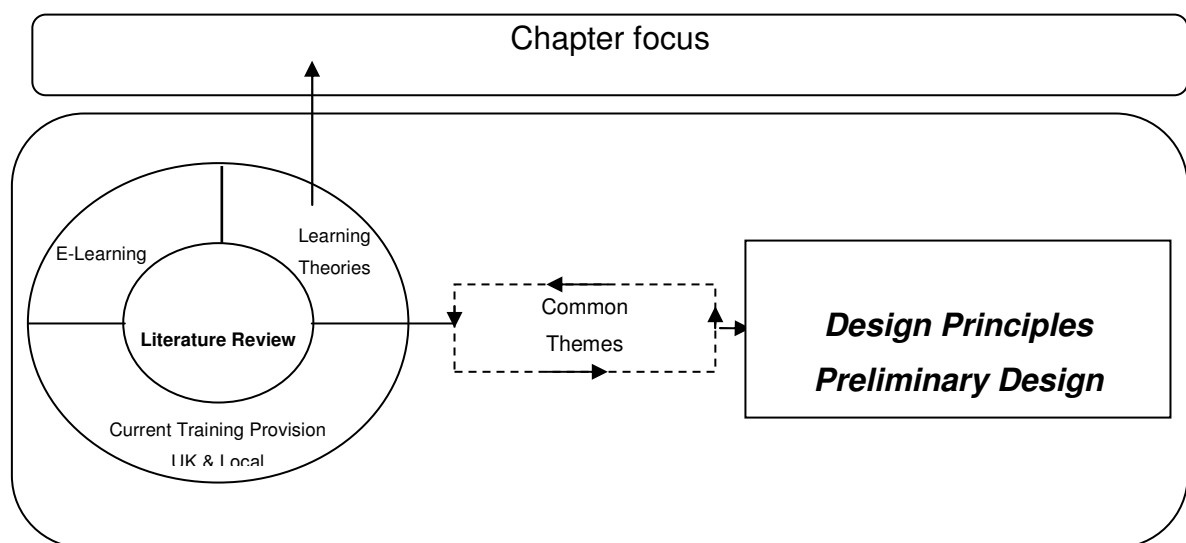


Figure 15: Chapter 6, Research Design

The qualitative philosophy combined with Induction will be used together to analyse the data collected. As with an inductive position, the research will seek to build up a model that is grounded by learning theory. Initial data collection will be concerned with establishing an understanding of what is Learning and this differs from training. An important aspect to research in this area would be establishing taxonomy of learning and building common attributes that necessitates each taxonomy with a view of optimising and enhancing the learning experience during online training. These elements would be vital in shaping the design of the training model in this research.

As with previous chapters, findings from this chapter will be evaluated through reflection to determine which are the common issues that should be considered as part of the preliminary design for training. The 'Common Theme' is a process of reflection that aims to draw together those elements deemed necessary in the training model design. Reflections or section 6.10, documents, the common issues that are considered as part of the preliminary design for training. This section details the first phase (Preliminary Design) completion of the training model.

6.3 What Is Learning?

Bower and Hilgard (1981) define learning as,

...the change in a subject's behaviour or behaviour potential to a given situation brought about by the subject's repeated experiences in that situation, provided that the behaviour change cannot be explained on the basis of subject's native response, tendencies, maturation or temporary states (1981:11).

This definition allows an inference regarding learning only when a case cannot be made for another explanation.

Learning is the act, process, or experience of gaining knowledge or skills. (Conner 1996:10)

Learning is the process through which we become the human beings we are, the process by which we internalise the external world and through which we construct our experience of the world (Jarvis, Holford & Griffin 1998: preface).

... a dependency of current behavior on the environment as a function of a prior interaction between sensory - motor activity and the environment (Pear 2001:12).

More recently,

...a long-term change in mental representations or associations as a result of experience (Ormond 2008:4).

These definitions address the issue that when learning takes place the result is a degree of change in behaviour. Simply put, 'we learn by doing;. The last definition is rather a simplistic view of learning as it does not address the sheer complexity of learning processes nor does it address other factors involved in the process of learning such as motivation, experience, attention and age. Taylor and Furnham (2005) define the main principles of learning as PROFIT: prior knowledge; relationships; organisation; feedback; individual differences and task perception. They summarise: cognitive theorists believe that "to facilitate learning... [it needs to be] linked to prior learning and experience" (2005:42). Learners need to link key ideas with concepts to give insight to a problem and its solution (Gestalt Theory). Learning content needs to be organised to make the process of learning easier. Cognitive theorists believe that using feedback can act as a motivator reinforcing learners to progress.

Learning is a continuous activity of life, which allows us to understand and make decision for the future that helps to shape our world (Kolb 1984). It does not cease when we leave formal education (Coffield *et al.* 2004). This activity of learning within the workplace enhances our ability to do our job more effectively. The workplace learning could be observational learning or 'On the Job training', or formal external training from a trainer. In either case, both memory and attention are central to the consideration of human learning. The process of learning brings about a change in behaviour that results from experience, memory is the effect of experience i.e. there will be no evidence of learning without something having happened in memory. Learning itself can be broken down into surface (rote learning) and deep (meaningful) (Biggs 1999). Surface learning is concerned with memory or habit, such as the ability to recall, repeat, quote, describe and where the learner can make the correct response. Deep learning is where the learner's approach to learning is to understand the topic or subject matter through meaningful activities. "This requires a sound foundation of relevant prior

knowledge” (ibid.:16), learners aim to understand the ‘big picture’ (Harrison 2004). Deep learning focuses upon the underlying meaning and principles. Similarly, in double loop learning (Argyris and Schön 1978) the learner’s underlying values are changed through challenging the way they see things, change is taken for granted, assumptions are challenged and values are changed. In an organisation, double loop learning becomes:

... those sorts of organizational inquiry which resolve incompatible organizational norms by setting new priorities and weightings of norms, or by restructuring the norms themselves together with associated strategies and assumptions. (Argyris and Schön 1978: 18)

The emphasis of deep learning is on depth of learning, rather than breadth of coverage. If values are to be changed, learning tasks need to be “meaningful and appropriate to background knowledge with focus on high conceptual level” (Biggs 199:16). The intrinsic motivation enforcing deep learning needs to be encouraged in organisational learning to empower employees to challenge work-based practices currently used. The desire to effectively improve practices in light of changing trends, technology and competition can only take place when employees have the knowledge and ability to make informed decisions. The learning process within the workplace is about professional competence that blends knowledge, skills and application.

Mayes (2001) states that leading the way to major changes in education may not be brought about by new technologies but rather:

it depends on developing novel forms of organisational processes and structures while carefully maintaining and enhancing the pedagogical principles (2001:17).

There is need to move away from focusing on learning material and transfer of information to a model which places the student at the centre. Alexander and Boud (2001) state the vital role of pedagogy in online learning environments is being neglected in a rush to make all things possible in the open environment of the Internet. The challenge is to offer pedagogy adaptable for geographically and socially dispersed setting for learners with varying levels of knowledge and

experience. Also, where the learning environment can mimic experiences at the same level of interaction one would experience if in a classroom based setting.

Rumelhart and Norman (1978) introduced a general theory of all learning limited to the context of language learning. They proposed that there are three modes for learning and contend that learners do not adapt entirely to new sets of cognitive structures, nor do they adapt totally to new teaching methods having been exposed to new knowledge but adapting and progressing to 'higher' levels of operation. This is the first of the three modes of learning, which the authors refer to as 'Accretion': the addition of new knowledge added to existing knowledge and memory. The second mode of learning is 'Structuring', which is concerned with the formation of new conceptual structures and incidentally requires considerable effort on the part of the learner. The third and final mode is 'Tuning', which is an adjustment of knowledge to a specific task through practice and refinement. This general theory of language learning has strong similarities with many other learning theories today. It is accepted that learners need to build upon existing knowledge to achieve the desired level of knowledge often referred to as Constructivism which will be explored later in this chapter.

The current provision of training for SMEs explored in the previous chapter highlights the difficulties employers experience in providing quality and timely training. Current provision does not provide a holistic programme for training that is informed by factors that affect learning. We will explore factors that affect learning and look to way as to provide solutions to these barriers within the portal design and its implication on online learning and how it will shape the proposed generic guidelines.

6.4 Andragogy Not Pedagogy

A number of frameworks and models have emerged, including self directed learning, transformative learning and Andragogy. Each gives attention to understanding how adults learn (Zemke & Zemke 1984), as this has implications for the way education is delivered. Compared to children, adults have special needs and requirements as learners. Malcolm Knowles pioneered much of the

work in adult learning. A distinction between Andragogy and Pedagogy was made, “Andragogy is the art and science of helping adults learn...” [in contrast to pedagogy which is] “...the art and science of teaching children” (Knowles 1988). The emphasis was that adults are self-directed, expecting to take responsibility for decisions and have the freedom to use their own experience and learn from the situation within which they find themselves.

The Andragogy model asserts that five issues be considered and addressed in formal learning (the assumptions upon which these are based can be found in Appendix 2). Adults:

- need to know why they need to learn something;
- need to learn experientially, i.e. relating the topic to the learners' experience;
- approach learning as problem solving;
- learn best when the topic is of immediate value;
- will not learn until they are ready and motivated to learn (Knowles 1988:110).

There is one key difference between Andragogy and Pedagogy, which is, children have fewer experiences and pre - established beliefs than adults and thus have less to relate. In essence, Andragogy means that instruction for adults needs to focus as much on the process as much as the content being taught. Knowles preferred to think of trainers as a facilitators, “To succeed, we must unlearn our teacher – reliance” (Knowles in Conner 1996:10). Learning contracts and facilitators are key features for Andragogy. However, emphasis is placed upon the learner to be self reliant in their learning, rather than for the Learning Facilitator to teach. Knowles wanted instructors to redefine their role from skilled practitioner transmitting information into the more effective role of being a facilitator of knowledge acquisition for the learner. There was a need to change from teaching-transmission orientation to content-acquisition orientation, that is, a focus shift from teaching to learning. The assumptions made of both Pedagogy and Andragogy has direct implication for the design of teaching programmes: A learner who is able to work collaboratively is a resource for others and has the ability to self diagnose learning requirements. It is this composite feature of

problem solving, reflection, and collaboration that needs to be encouraged and facilitated in adult learning

6.5 Learning Theories Taxonomy

It is difficult to clearly classify learning theories. Many aspects overlap in more than one area. Reid and Barrington (1997) attempted to classify learning theories into the following sets:

1. Behaviourism theories.
2. Cognitive theories.
3. Experiential learning theories.
4. Cybernetic/Information theories.
5. Learning to learn and self development.
6. Mental processes (ibid.74)

As the training activities for this research will take place within the workplace, On the Job and Communities of Practices together will support social learning. As mentioned there are aspects of learning theories that overlap into more than one set. For example, memory can be considered part of both Behaviourism and Mental processes. Thus, simplifying this list and propose the following broad set of learning theories for work-based learning:

- Behaviourism and Classical conditioning.
- Cognitive Theories.
- Constructivism (Experiential learning).

Within each set we will look at the factors that affect learning and at ways that can ensure that barriers to learning are minimised through instructional design.

6.6 Behaviourism

6.6.1 Overview

The view of Behaviourism or Conditioning was very dominant during the 1950s & 60s in the classroom, with their roots in psychology. Some influences still remain although other theories have gained much ground. Behaviourists emphasise the role of the environment in directing behaviour. Early work relating to Behaviourism was led by the likes of: Pavlov; Thorndike; Skinner and Tolman. It is generally accepted that learning takes place through conditioning which is subdivided in: classical and operant. Schunk defines classical conditioning as "... an unconditioned stimulus (UCS), which elicits an unconditional response (UCR) (2008:34). Operant or Instrumental conditioning is described as

the relationship between reinforcement and the organism's behavior ... the organism must act in a certain way before it is reinforced; that is, reinforcement is contingent on the organism's behavior (Hergenhahn & Olson 2005:9).

Measurable objectives and computer based training are just two examples of behaviourist learning theory in practice. Many of the early behaviouristic experiments were done with animals focusing on reflexive behaviour of an organism exposed to certain stimuli. In short, behaviourists attempt to explain learning by focusing on objectively observable behaviour and how an organism adapts to the environment and discounting mental processes. Their work is grounded in mathematical science as there is a need to measure learning. The approach is parsimonious, explaining a great variety of phenomena using only a few simple (classical and operant) principles. From very low level learning experiments focusing largely on reflexes, behaviourist theories have been generalised to many higher level functions as well. Borger and Seaborne (1966) as quoted in Jarvis, Holford and Griffin (1998) suggest that learning is

...any more or less permanent change in behaviour which is the result of experience (1998:21).

This definition of learning focuses on the measurable behavioural outcomes of learning, rather than on knowledge, attitudes, values and beliefs and with science being more than just empirical and measurable behaviour. As argued by Jarvis,

Holford and Griffin (1998), its sole concern is behaviour, which is not merely observable action. An important aspect of behaviouristic theories is that the learner is viewed as adapting to the environment while learning is seen largely as a passive process in that there is no explicit treatment of interest in mental processes. The learner merely responds to the demands of the environment. Knowledge is viewed as given and absolute (objective knowledge).

6.6.2 Classical Conditioning

Ormond states that much of the earlier work relating to Classical Conditioning was pioneered by Ivan Pavlov in the early 1900 (Ormond 2008). Pavlov first studied conditioned reflexes associated with dogs. Observations of dogs helped to the development of the Classical Conditioning model. His research showed that dogs salivated at the sight of dry food, if a buzzer sounded just before the dogs were given sight of the dry food they will salivate at the sight of the food. After the two were associated in this way a number of times, the dogs salivated at the sound of the buzzer, even before the food appeared. Pavlov called the presentation of the food the unconditioned stimulus (UCS) and the salivation the unconditioned response (UCR). This work was then used as a basis for more extensive claims about learning such as Skinners (detailed in section 6.6.3.).

Ormond (2008) presents several implications of Classical Conditioning in instructional practice. Repetition strengthens the association of stimulus and response, the ability to practice for instance experiment or demonstrate, promotes active respondents rather than passive recipients throughout the learning process. Secondly, "...students should encounter academic subject matter in a positive climate and associate it with positive emotions" (Ormond 2008:46). Positive reinforcement of desired behaviour elicits levels of encouragement moving the learner through the learning content. It is also important to break bad habits through counter conditioning by replacing one undesired S-R connection with more productive ones. Finally, assessing learning involves looking for behavioural change. The premise that learning brings about behavioural changes will allow you to determine whether the learner has learnt. The use of performance tests can allow you to confirm that learning has taken place. In order to perform tests it

is important that there are set objectives or attainment targets against which to measure the required behaviour.

6.6.3 Operant Conditioning

Operant Conditioning describes observable behaviour, subsequent variable theories and introduces elements as memory, motivation, and cognition. Thorndike's investigation into the Stimulus–Response framework, typical of Behaviourism resulted in the development of three laws: law of effect, law of readiness, and law of exercise (Ormond 2008). The reinforcing of desirable behaviour or learning through rewards required the manipulation of the environment at the time of the event which may act as an incentive towards learning. This concept was later taken by Skinner (1954) and developed further. Skinner's theory is based upon the premise that learning is a function of change in overt behaviour. Changes in behaviour are the result of an individual's response to events (stimuli) that occur in the environment. When a particular Stimulus-Response (S-R) pattern is reinforced (rewarded), the individual is conditioned to respond. The distinctive characteristic of operant conditioning relative to previous forms of behaviourism in that the individual can emit responses instead of only eliciting a response due to external stimuli means behaviours can be learnt. The theory focuses on behaviour that can be seen and measured suggesting that behaviour is strengthened or dismissed depending on the consequences of earlier behaviour.

A reinforcer is a stimulus strengthening the desired response. It could be verbal praise, a good grade or a feeling of increased accomplishment or satisfaction. In operant conditioning (Skinner 1954), a response is learned because it leads to a particular consequence (reinforcement), and it is strengthened each time it is reinforced. Positive reinforcement strengthens a response if it is presented afterwards, while negative reinforcement strengthens it by being withheld. Once a response has been learned, it may be sustained by partial reinforcement, which is provided only after selective responses. Skinner's work with animals resulted in

the formulation of two laws: that of 'conditioning' (a response followed by a reinforcing stimulus is strengthened and is more likely to reoccur) and that of 'extinction' (non-reinforcement following the response). It was recognised that positive reinforcement, provided it has personal impact, plays a significant role in human learning. The application of Skinner's theory can be seen widely in primary and secondary education (Skinner 1968). The system of reward, when a certain behaviour or result is achieved by children is extolled. This is not as widely recognised in adult learning. However, it is apparent that when adults achieve certain performance targets they tend to be rewarded through pay. Positive reinforcers such as: monetary incentives; qualifications; positive feedback; material; social; activity; intrinsic reinforcers only further enhance levels of desired behaviours and participation in learning and training (Ormond 2008). The importance of incentives in learning was highlighted in chapter three. The inclusion of qualifications as an outcome from training was perceived as important, however pay incentive had a direct association with skills acquisition. Similarly, knowing you are doing well, and are progressing, is also a motivational factor.

According to Skinner, forgetting occurs simply as a result of the passage of time with no repetition of the behaviour during this time. One process of teaching is an attempt to bring the rate of learning somewhere above the rate of forgetting. One could arrive at an index of a teacher's effectiveness by computing the difference between these two rates (Skinner 1957).

Guthrie (1952) attempted to simplify Thorndike's and Skinner's theory by moving away from complicated mathematical equations that defined S-R. The introduction of the 'Law of Contiguity', was "a combination of stimuli which has accompanied a movement will on its recurrence tend to be followed by that movement" (ibid.:23). In other words we learn from experience. Rogers takes this a step further with the theory of Experiential Learning. Rogers (1969) distinguishes two types of learning: cognitive and experiential. The former corresponds to academic knowledge such as learning vocabulary or multiplication tables while the latter refers to applied knowledge such as learning about engines in order to repair a car. This was considered to be of the utmost importance. The key to distinction is that experiential learning addresses the needs and wants of

the learner and is equivalent to personal change and growth. All human beings have a natural potential for learning and education should help to discover how to learn and support learners as they learn to embrace change (ibid.:131). Rogers argues that the environment affects the actualising tendency (achieving personal growth) and as such the role of the learning facilitator should be to:

- establish a positive climate for learning;
- clarify the purposes of the learner(s);
- organise and make available learning resources;
- balance intellectual and emotional components of learning;
- and share feelings and thoughts with learners but not dominating (Rogers 1969).

Rogers' view of free will includes the idea that if you decide to let others control you, that is still an example of free will. In practice, it is hard to distinguish between free choice and situations where a person is unwittingly controlled by others. They may just think they are free. It was considered that the most effective learning happens when the following criteria is fulfilled: We

- really want and need the knowledge;
- know how we will apply it;
- will be rewarded one way or another for having it;
- can draw on our experience;
- can learn at our own pace and style;
- are stretched and challenged;
- are supported;
- are treated as an individual with unique needs by whoever is helping us to learn (ibid.:34).

Rogers offers many principles to enhance learner motivation and to focus people to strive for challenges and maximise potential for learning (Rogers & Freiberg 1994). Clearly, there can be parallels drawn from this theory that relate to principles of Constructivism and Andragogy (Jarvis, Holford & Griffin 1998).

Miller and Dollard (1941) attempted to apply Drive reduction theory⁴ (imitation) to a broader range of learning phenomena. One illustration was that of a student learning to sing on key

...the perceived discrepancy between the student and teacher was conceptualized as a graded cue motivating an appropriately graded, directional alteration in vocal response, so that the altered note sung by the student appeared closer to that of the teacher. (Bower & Hilgard 1981:109)

Miller and Dollard stated that reducing the discrepancy was a result of the relational response guided by the feedback of a relational cue (S-R-Reinforcement). One problem with Drive Reduction theory is it suggests that learning will not occur unless drive is reduced through reinforcement. A view supported by Tolman through his experiments with rats (Ormond 2008) They were given the opportunity to learn their way through a maze without reinforcement, suggesting that drive reinforcement is not necessary for learning to occur. However, it was Bandura's (1977; 2001) research took these ideas to a new level and provided the antecedents for Social learning.

6.6.4 Social Learning

Vygotsky's theory is complementary to the work of Albert Bandura on Social learning and a key component of Situated Learning Theory. Bandura is particularly known for work on observational learning, also referred to as 'modelling' or 'imitation'. Much of Bandura's work has focused on the acquisition and modification of personality traits in children, particularly as they are affected by observational learning, or modelling, which plays a highly significant role in the determination of subsequent behaviour. The importance of observing and modelling the behaviours, attitudes, and emotional reactions of others:

⁴ Hull and Spence (in Bower & Hilgard 1981) introduced motivation as an intervening variable in the form of homeostasis. An imbalance creates needs, which in turn create drives. Actions can be seen as attempts to reduce these drives by meeting the associated needs. According to drive-reduction theory, the association of S-R in classical and operant conditioning only results in learning if accompanied by drive reduction.

Social learning theory emphasizes the prominent roles played by vicarious, symbolic, and self-regulatory processes in psychological functioning (Bandura 1977:vii).

The extent to which children or adults learn behaviours through imitation is influenced not only by the observed activity itself but also by its consequences. Learning solely through relying on one's own actions to inform them of what to do, would be "...exceedingly laborious, not to mention hazardous" (ibid.:22).

Bandura wrote,

People do not live their lives in isolation. Many of the things they seek are achievable only through socially interdependent effort. Hence, they have to work in co-ordination with others to secure what they cannot accomplish on their own (Bandura 2001:13).

For example, when an individual is training for a new job there is a reliance on others through observational learning, motivation, co-operation and co-ordination to understand their own role in the environment and from the collective power to produce the desired results. By observing others,

...one forms an idea of how new behaviours are performed, and on later occasions this coded information serves as a guide for action. (Bandura 1977:22)

Moreover, learning by modelling will occur although neither the observer nor the model is rewarded for performing a particular action, which is in contrast to the behaviourist theories (Skinner and Pavlov), where the focus on learning is through conditioning and reinforcement. A person will more readily imitate a model that is being rewarded than one which is being discouraged (Warren 2000). Thus, one can learn without actually being rewarded or punished, a concept known as 'vicarious learning'. Bandura contended that during the process of observational learning where the learner gives attention to behaviour, what is seen is retained and the learner will then have the ability to reproduce that behaviour. The success of that ability gives the motivation to continue (ibid.:23).

This method of learning has been used in children and adults to treat phobias (Clark & Fairburn 1997). The patient watches the model that is in contact with the

source object, firstly under non-threatening conditions. The patient is then encouraged to perform the same actions as the model, and gradually the situation is made more threatening until the patient is able to confront the feared object or experience on his or her own. Clearly, the person's perceived 'self-efficacy' (mastery) will affect whether they will use that behaviour (Bower & Hilgard 1981:470). Schunk (1995) contends there is a link between instruction and motivation and hence increasing motivation if the instructional design encourages such.

There are commonalities between social learning and Piaget's theory (1970) in their emphasis on the development of plans of action. Both theories recognise the importance of developing the ability to translate what is perceived to correspond with actions, and to convert thought into organised sequences of actions. However, in social learning theory, observational learning is not confined, nor is self-discovery through behavioural manipulation the only source of information, as emphasised by Piaget. Information can be gained from observed modelled examples as well as from the consequences of one's own behaviour, as already mentioned. Learning is socially mediated i.e. affected by the people around us (Bandura 2001, Lave & Wenger 1991). There are many factors, which affect a person's desire to learn. These include relationships, group dynamics, cultural norms and levels in social participation. Observing more experienced colleagues can accelerate learning (observational learning) and it is argued that this informal process of training can be more effective than formal training methods (Enos, Kehrhahn & Bell 2003), particularly for SMEs.

Lave is a social anthropologist with a strong interest in social theory. Much of Lave's work, both in ethnography and in social theory, concentrates on the re-conceiving of learning, learners, and educational institutions in terms of social practice. Lave argues that learning as it normally occurs is a function of the activity, context and culture in which it occurs (Lave 1988). Lave states that knowledge is of no use if it is so abstracted away from the context that it cannot be usefully applied and understanding will be so tenuous that it will be easily forgotten. As with Bandura, social interaction is seen as a critical component of situated learning. Lipman (1991) indeed forwards the idea of "reflective

education". While learners must engage in activities (practices), they must do more. Without reflection about practices, it is possible for activities to prevail even when the context changes to make them inappropriate (the opposite problem of not transferring to a new, appropriate context). Lipman (1991:102) states "...practice is what we do methodically and with conviction but without a conspicuous degree of inquiry or reflection. The activity itself is not what is important, but the activity as an object of discussion, inquiry and creative thinking (Constructivism).

6.6.5 Using Behaviourist Principles In Online Learning

As in the previous section, there are four key principles of behaviourism. They are:

- repetition – practice makes perfect;
- objectives – measurable metrics;
- activity – learner is active rather than passive;
- reinforcement – rewards system, e.g. praise and other feedback.

The array of theories considers people's behaviour in responding to stimuli limits the application of strategies in instructional design (McLoughlin 1999). Thoughts of behavioural processes are still considered today even though the research relating to it dates back to the 1900s. This is because behaviourist principles 'work' (Roediger 2004). However, the use of behaviourism in its initial forms has somewhat diminished. In recent years, developments in Cognition have changed our understanding of how people learn. Repetition needs to be context specific in other words it needs to relate to work practices (Lave & Wenger 1991), in turn reinforcing memory. Furthermore, the use of active learning brings forth the notion that learning should not be abstract from our environment.

Before embarking upon any training employees need to be willing to take training. This may require a change in organisational culture. We need to embed training as a function of the business rather than a desirable task. The establishment of a positive environment to maximise the potential for training is an important factor. It

is important to develop a positive environment where employees are permitted training during work hours. The positive environment needs to be supported by praise encouraging the employee's progression. This can be further enhanced with the use of reinforcers. Ormond summarises the use of the following reinforcers to increase desirable behaviours:

- specify behaviour(s) up front;
- use extrinsic reinforcers only when desired behaviours are not already occurring on their own;
- identify consequences that are truly reinforcing for each learner (tailored reinforcers);
- make response – consequence contingencies explicit;
- administer reinforcement consistently;
- gradually shape complex behaviours;
- when giving reinforcement publicly, make sure that all students have the opportunity to earn it;
- use objective criteria to monitor progress;
- foster the ability to delay gratification;
- once the terminal behaviour has been acquired and is occurring regularly, gradually wean learners off of extrinsic reinforcers. (2008:86)

So, how would this be applied by the SME? Feedback is a vital factor in motivating learners. Positive and constructive feedback can motivate learners to continue with the learning process, it can help them to realise which direction to take. Feedback is more likely to be better received if it is done privately i.e. via face-to-face discussions or through emails. It is also important to ensure that this exchange is conducted without patronising the employee. Hackett (2003) suggests rules relating to how feedback is given, firstly the need to ensure feedback is related to course objectives and is objective. To be objective comments should be on evidence so as to be constructive and provide clear positive alternatives of behaviour.

Feedback is designed to advance development and learning of an individual. The administration of reinforcers requires employers' commitments to lead the training

programme. This commitment should be used as the driving force for change in business. Planning and management from a strategic level as stated in chapter three would pave the way to implementing a learning foundation. Though there is a level of bureaucracy involved it should not hinder the effectiveness of implement the training and the reinforcers.

Biggs (1999) states objectives need to be aligned with both learning activities and assessment tasks. In chapter four the need to ensure that the learning content is aligned with the organisational strategy was discussed. Deep learning is achievable by providing relevance to the learning process. Aligning content with the organisational strategy, can provide relevance of training to the employee. Martin (2003) suggests that learning content is married to workplace practices, to affirm relevance to work activities. This alignment will allow us to measure the effectiveness of learning. The change that takes place in the business will provide an indicator of the success that is taking place. The use of Kirkpatrick's evaluation model (1996) can then be applied if these measures are in place.

6.7 Cognitive Theory

In direct contrast to Behaviourist theories, which are concerned with the establishment of particular behavioural patterns, Cognitive theories draw attention to the way in which we learn, recognise and define problems or experiment to find solutions, whether by trial and error, by "deductive reasoning" [or by] "seeking information and help" (Reid & Barrington, 1997:84). Cognitive theories are said to be more "speculative than behavioural theories" (Pear 2001:51). The approach began to revolutionise psychology in the late 1950s and early 1960s, and became a dominant paradigm in the subject by the 1970s. Interest in mental processes had been gradually resurrected through the work of people like Tolman and Piaget, but it was the arrival of the computer that gave cognitive psychology the terminology and metaphor it needed to investigate human minds.

Cognitive psychology compares the human mind to a computer, suggesting that we too are information processors, and that it is possible and desirable to study the internal mental processes that lie between the stimuli we receive and the

responses we make. Cognition means 'knowing' and cognitive processes refer to the way in which knowledge is gained, used and retained. Therefore, cognitive psychologists have studied perception, attention, memory, thinking, language, and problem solving. Some of the earliest work relating to cognition came from Kohler, Tolman and Piaget (Flavell 1963). Kohler's work in the 1920's and 30's (in Ormond 2008), illustrated that chimpanzees were able to solve problems through the use of insight. It was believed that they had actually worked out what they needed to do and that the process of learning was more complex than a simple S-R association. Building on this, Tolman demonstrated that rats were capable of cognitive behaviour but disagreed with the perception of S-R learning, as his findings indicated that the rats had learned an image of the maze (a cognitive map) which they would use at a later time.

Tolman demonstrated in the 1920s that learning could involve knowledge without observable performance. It was argued that behaviour was best described in terms of action with a purpose and goal. The performance of rats that negotiated the same maze on consecutive days with no reward improved drastically after the introduction of a goal box with food. The experiment led to the belief that they had developed 'cognitive maps' of the maze, even in the absence of a reward, although this 'latent learning'⁵ had not been reflected in their observable behaviour (Ormond 2008:150), concluding that insight played a role in problem solving. Rather than simply stumbling upon solutions through trial and error, his observation seemed to demonstrate a holistic understanding of problems, in other words arriving at solutions in a sudden moment of revelation or insight.

Work in cognitive learning was taken to a new level by Piaget (1969). His work directed interest and attention to human learning. Piaget offers a coherent perspective of the maturation of intellectual thought and development. Cognitive development was, as it seemed, to precede the learning. In light of this Piaget's work gave rise to work in the cyclical nature of learning and the ways children and adults adjust to and accommodate their environment (Brainerd 1978).

⁵ Learning simply by exploration without reward.

Moving on from Piaget, theorists started looking at modelling the process of learning. Like Piaget, Vygotsky and Kozulin (1986) undertook research with children, developing Social Development Theory. They point to the value of collaboration (social constructivism), in the development of cognition, rather than total independence and the potential rather than achievement (Wertsch 1985). Children do with the assistance of others might be an even better indication of their mental development than what they achieve by themselves, that learning should be matched in some manner with the child's level of development. The relationship of the developmental process and learning capabilities can challenge the assumption that

...cognitive development is the individual construction of an internal mental construct; instead, cognitive abilities are formed and developed from interaction with the social environment, inter-psychological before they become internalised and intra-psychological (Thompson 1999).

The actual development level is the level of the child's mental functions resulting from the developmental cycles, which have already been completed, in other words, the potential of the learner at any particular time. The potential for cognitive development is limited to space, called the 'Zone of proximal development' (ZPD) (the enhanced capabilities of a learner working in the presence of a more skilled co-worker or teacher). Vygotsky defined this as,

...the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky 1978:86).

Bridging the gap to take the next step is very much a learner-centred process. Tutors, colleagues or other learners are simply facilitators, who can guide them through progressively more challenging learning activities. Vygotsky's work is linked to constructivist theories. This is a general theory of knowledge acquisition that has been "applied in the context of technology-based learning activities that focus on problem - solving skills" (Mayes 2001:24). Engestrom (2001) took Vygotsky's work to a new level by expanding his mediating triangle with a social component that also mediates our action. Engestrom brought together goals, tools, collaboration and developmental activities to deliver Activity

theory. However, another extension of Vygotsky's work was Social Learning theory, which has been explored in section 6.6.3.

Robert Gagné (1985; 1987) an experimental psychologist, was concerned with instruction and information processing. His work seemed to be influenced by the information processing view of learning and memory and the role of instructional technology in learning. A learning theory consists of a set of constructs and propositions that account for how changes in human performance abilities come about. Gagné's instructional theory seeks to describe the conditions under which one can intentionally arrange for the learning of specific performance outcomes. The theory has three major elements: first, it is based on a taxonomy, or classification, of learning outcomes; second, it proposes particular internal and external conditions necessary for achieving these learning outcomes. And third, it offers nine events of instruction, which serve as a template for developing and delivering a unit of instruction. Instructional theories are often based on one or more learning theories, but there is "rarely a simple correspondence between the two" (Bower & Hilgard 1981:554).

Gagné began with a concern for making traditional learning principles more applicable to training tasks. Two things were required for applications, firstly a psychological analysis (task analysis) of the many component skills and their assembly that students need in order to perform some complex tasks, leading to the idea of skills hierarchies. Secondly, such analyses identify for researchers a number of distinct types of learning (Bower & Hilgard 1981). Essentially, Gagné stipulates that there are several different types or levels of learning. The significance of these classifications is that each different type requires different types of instruction and this identifies five major outcomes of learning:

- verbal information;
- intellectual skills;
- cognitive strategies;
- motor skills;
- and attitudes (Gagné, Briggs & Wager 1992:54).

These outcomes are the result of the internal processes of learning in individual learners. They provide the learners with the improved capabilities, which are desired. The external conditions of learning (such as instruction) which cause the learning are different for different types of learning outcome. For example, the need to do different things to learn attitudes than to learn intellectual skills or motor skills. Although different in detail, the same types of instructional activity are needed for all learning processes and learning outcomes. Gagné suggests that there are nine general instructional events which should satisfy or provide the necessary conditions for learning are always relevant, even though in detail they will vary with the type of learning outcome being achieved, and with the specific content of the learning:

1. Gaining attention (reception).
2. Informing learners of the objective (expectancy).
3. Stimulating recall of prior learning (retrieval).
4. Presenting the stimulus (selective perception).
5. Providing learning guidance (semantic encoding).
6. Eliciting performance (responding).
7. Providing feedback (reinforcement).
8. Assessing performance (retrieval).
9. Enhancing retention and transfer (generalisation) (Gagné *et al.* 2004:123).

Learning tasks for intellectual skills can be organised in a hierarchy according to complexity, in order to identify prerequisites that should be completed to facilitate learning at each level, hence providing the sequencing of instruction. Though Gagné's theoretical framework covers all aspects of learning and has been applied to the design of instruction, the focus of the theory is on intellectual skills (Gagné *et al.* 2004). We will return to the issue of organising instruction in a hierarchy and how to apply this to SMEs, later in this chapter.

6.7.1 Memory, Reinforcement And Attention

In section 6.6.1 learning has taken place if behaviour changes was explored. Cognitive theories take memory a step further by considering mental processes.

They consider memory and attention as central to the consideration of human learning. The process of learning brings about a change in behaviour that results from experience, memory is the effect of experience i.e. there will be no evidence of learning without something having happened in memory. Memory can be defined as the capacity of learning or your stored information, it is the process of retaining and retrieving information from the brain that is central to learning and thinking.

Building on Aristotle's view of memory, Hermann Ebbinghaus developed a means of measuring numerically and quantifying the memory process and thus brought scientific methodology to the subject (Taylor & Furham 2005). Ebbinghaus introduced the Curve of Learning which quantified how quickly people forget. Ebbinghaus qualified his data through the use of a formula and plotted the saving scores against the amount of time delay between original and re-learning. The development of the forgetting curve qualitatively depicted the loss of memory data over time. The curve, showed that almost forty percent of forgetting occurred within the first 20 minutes following original learning and that the loss between one and 31 days was inconsequential. Another contribution of Ebbinghaus involved the identification of a serial position effect. Ebbinghaus found that when trying to recall a moderate size list of XOXs (e.g. 12 items) in order, it was easier recalling items from the beginning and end of the list, but often forgetting items near the middle of the list (Primacy effect) (Ruger & Bussenius 1913). To help explain this occurrence, memory can be categorised into three memory modes working, short term and long term (Baddeley 2007; Sweller, van Merrienboer & Paas 1998).

- **Working memory** – perceives what is happening, from the stimuli (senses) and processes the information.
- **Short term** – retains information for a short period of time after processing the information
- **Long term** – information passed from the short-term memory and retained in the brain over a long period of time after encoding and integration.

The implication of Ebbinghaus's learning curve is that instruction delivered in smaller chunks has a greater chance of being retained in long term memory provided it has been encoded and integrated through rehearsal (Williamson 2001). Providing timely training that is relevant to the immediate needs of the learner can be enhanced if broken down into specific chunks each with associated learning objectives. As a learning need arises the learner can look to training to fulfil the learning need. Learning content delivered in smaller chunks can permit JIT learning. The way in which the content is presented must be considered to optimise the learning.

Cognitive Load Theory (Feinberg & Murphy 2000; Mayer 2001) shows that presenting information simultaneously in two ways, text and audio, for example results in more information to process. The result is that the learning process is slowed down and is not as effective as when the information is only presented once. This is known as the Redundancy effect. The key is to allow for narration but limit redundant text in multimedia presentations. Also, having an on/off narration features allows the learner to control the learning process. Feinberg and Murphy (2000) address how Cognitive Load theory should be applied in the design of web based instruction. Instructional information is seen to be of two types: intrinsic and extraneous. Intrinsic load is characterised as the degree of difficulty content to be learnt has that cannot be modified by instructional design. Whereas extraneous load is seen as the way in which an activity or task is presented and organised, which may not be relevant to the attainment of goals. Feinberg and Murphy place emphasis on reducing redundant activities (extraneous cognitive load) and information that make demands of the learner's mental load. The use of multimedia technology can increase extraneous cognitive load, an effect that can be addressed through removing or reducing redundant sources, presenting content through text or graphics but not both at the same time, and using a combination of visual and auditory modality that increase memory capacity availability.

Miller (1956) presented the idea that short-term memory could only hold 5-9 chunks of information. The chunks could refer to digits, words or pictures, for example, people's faces. Miller, Galanter & Pribram (1960) also introduced TOTE

(Test Operate Test Exit), suggesting that it should replace the stimulus - response as the basic unit of behaviour. In a TOTE unit, a goal is tested to see whether it has been achieved and, if not, an operation is performed to achieve the goal. This cycle of test-operate is repeated until the goal is either reached or abandoned. For those people who have difficulty in remembering large amounts of information, chunking provides a solution. There is a need to break down large amounts of information into small chunks. The important issue to remember is that there needs to be a logical connection between each of the chunks thus providing meaningful information. The process of chunking leads to modularisation, which has many advantages both for the learner and trainer. The learner and trainer can both concentrate on a single element before they move onto the next. This helps ensure information can be easily digested, processed and retained. However, it is important to ensure that each module has a logical connection. For example, the start of each module can begin with the recap of the previous and demonstration of how this module will build on previous knowledge (Knowles 1988; Salmon 2001).

Before encoding and schematic integration can occur, instructors must assist the learner in focusing their attentions on the desired input. The first step in increasing memory or more specifically the long-term memory of learners is to ensure the instructional objective is clear. By stating the objective before instruction, the learner will better be able to select important new information. The use of concrete models and analogies is also an effective technique used to focus learner attention. An informal technique, such as signals, routines, incentives, and teacher proximity to learner also facilitates the selection of information. To ensure this short-term memory is not lost, the learner needs to incorporate several rehearsal techniques which help them to make sense of the information. There are two types of information rehearsal: maintenance and elaborate. The first does little to ensure encoding of the information. According to Elaboration theory, the development of instruction should be organised in order of complexity for optimal learning, a view also supported by Gagné's task analysis model. The elaboration model follows a general - to - detailed pattern of sequencing, thus, allowing the learner to learn at the level of detail that is most meaningful to him or her, given their development of knowledge. Reigeluth & Rogers (1980) argue that

Synthesizing is extremely important for most kinds of instruction because it makes the parts of the subject matter more meaningful to the student by showing their context...that is, by showing how they fit into a larger picture (ibid.1980)

At the same time instruction should remind the learner of the simpler ideas on which the more complex are based. Synthesising refers to ways of showing the interrelationships among topics. Elaborate rehearsal relates the new information to the learners' existing schemes. This rehearsal can take one of three forms, or a combination of the three:

- verbal proposition, comparing and contrasting new and existing information;
- visual
- auditory imagery, a linkage of information through acronyms and/or imagery.

This is also important to instructors, because weak learners tend not to be able to generate their own mnemonics. Once new information has been integrated into long-term memory, learners may still need intervention for successful construction of relationships (Williamson 2001). Training needs to incorporate repetition and testing as stated in section 5.7. Testing adults allows us to see the level of information that has been retained in the long term memory. Repetition allows the learners to be presented with information repeatedly until information can be moved from short term to long term memory.

6.7.2 Using Cognition In Online Learning For SMEs

Many aspects of learning have been considered in this chapter, issues ranging from memory to hierarchy of instructional events. This section brings together the instructional implications of cognitive theory that need to be applied in the design and delivery of training within the portal.

Table 7 below summarises the instructional design principles that have been extracted from our understanding of cognition. These instructions are designed to ensure that the training programme optimises the learning experience, provides

opportunities for JIT learning but at the same time placing emphasis on building knowledge from a foundation and in par providing attention to motivation and encouragement.

Table 7: Using Cognition In Online Learning

Menu Structure	<p>Develop a menu system for learning content (Modularisation). The content should be organised from lower level or higher order skills. Each module should have its own set objectives to measure learning, which are associated with the SME's objectives. Furthermore, a recap of what has been learnt in the given chapter. Limit levels in the hierarchy as this makes the structure more complex than necessary.</p> <p>Breakdown further (chunking) the content within each topic. Each chunk should have its own specific purpose. There needs to be a clear link between each of these chunks.</p>
Motivation and Attention	<p>Tailor the screen designs to be visually stimulating and intuitive. Redundant text and images should be removed and where possible kept to a minimum.</p> <p>Design an interface design, which is digestible (i.e. clear and uncluttered). Large amounts of text are a distraction and do not enable the digestion of material, they need to be granular or comprise of small chunks of material or text.</p> <p>Provide sufficient technology to support the learner this includes bandwidth processing power.</p>
Consistency	<p>Develop familiarity of structure by binding the portal components design together seamlessly ensuring there is consistency.</p>
Hyperlinks	<p>Establish hyperlinks, but the links presented should firstly be relevant and good quality links, that are still active. The</p>

	advantage of the Internet is that there is a wealth of information available for the learner to exploit.
Applicable to real situation?	Select learning material, which is relevant to work. The resultant knowledge should be applicable to the learners' experience and should be information up-to-date.
Redundancy effect	Present content in one mode with the option to switch from text and narrative hence increasing information absorption.

6.8 Constructivism

Constructivism has its developmental perspectives from the likes of Piaget, Bruner, Vygotsky, Papert and Dewey. In arguing that there has been a lack of interchange of ideas between learning theory and instructional practices, (2001:115) believes that “constructivism plays an important role for building this relationship”. Constructivism is considered to be more a philosophy than theory of learning. It is founded on the premise that human knowledge is constructed and that learners need to actively build new knowledge upon the foundation of previous learning. This view of learning sharply contrasts with one in which learning is the passive transmission of information from one individual to another, a view in which reception, not construction, is key (Bruner 1990; McInerney & McInerney 1994).

Each of us generates our own rules and mental models, which are used to make sense of our experiences. Learning therefore, is simply the process of adjusting our mental models to accommodate new experiences. It is not simply a process of memorising right answers and regurgitating, but of understanding the meaning which is rooted and indexed by experience (Brown, Collins & Duguid 1989). Brown and Duguid (1991) argue use of our knowledge in authentic situated learning activities, allows us to build an increasingly rich understanding of the subject itself. Agreeing with this statement, Laurillard (2002) argues that learners can recognise the heuristics of a task but not the situation in which the particular heuristic should be applied i.e. learner has the theory of the subject matter but not

the ability to apply the theory for particular situation. The knowledge that “students bring to a course will necessarily affect how they deal with the new knowledge being taught” (Laurillard 2002:25) but they fail to recognise which learning theory might be suitable for given situations.

The learning process focuses on primary concepts, not just on isolated facts. The implication for instructional design is that the learner’s learning needs should focus on problem based scenarios, using methods such as project based learning, team based learning, simulations, role-play and use of technology resources. The teacher should not teach in the traditional sense of delivering instruction to a group of learners. Rather, they should structure situations such that learners become actively involved with content through manipulation of material and social interactions (Schunk 2008). In order to teach well, there must be an understanding of the mental models that learners use to perceive the world and the assumptions they make to support those models. Since education is inherently interdisciplinary, the only valuable way to measure learning is to make the assessment part of the learning process, ensuring it provides students with information on the quality of their learning.

The constructivist theories take on a variety of forms as do the behaviouristic and cognitivist theories. The basic distinction is that while the behaviourists view knowledge as nothing more than passive, largely automatic responses to external factors in the environment and the cognitivists view knowledge as abstract symbolic representations in the head of individuals, the constructivist school views knowledge as a constructed entity made by each and every learner through a learning process. Knowledge can thus not be transmitted from one person to another, it will have to be (re) constructed by each person. Knowledge is seen as relativistic (nothing is absolute, but varies according to time and space) and fallibilist (nothing can be taken for granted). There is an important distinction within the constructivist school of learning, between Cognitive oriented constructivist theories which draw insight from Piaget and focus on individual constructions of knowledge discovered in interaction with the environment, and Socially oriented constructivist theories which rely more on Vygotsky and view learning as connection with and appropriation from the socio-cultural context.

6.8.1 Cognitive Constructivism

Cognitive oriented constructivist theories emphasise the exploration and discovery on the part of each learner as explaining the learning process. Bruning, Schraw & Ronning, (1999) offer the following definition of cognitive psychology:

a theoretical perspective that focuses on understanding human perception, thought, and memory. It portrays learners as active processors of information – a metaphor borrowed from the computer world – and assigns critical roles to the knowledge and perspective students bring to their learning. What learners do to enrich information, in the view of cognitive psychology, determines the level of understanding they ultimately achieve. (ibid.:2)

In this view, knowledge is still very much a symbolic, mental representation in the mind of the individual. However, and this is very important since it is the basis of much of CSCL, the socially oriented constructivist theories stress the collaborative efforts of groups of learners as sources of learning.

6.8.2 Social Constructivism

Social Constructivism derives from the work of Vygotsky and Bruner. Where Piaget emphasised learning as an internal process, Vygotsky (1978) stressed environmental, social and cultural influences, a view supported by Philips (1995). While there are different interpretations of constructivism, their common denominator seems to be a belief that knowledge is created by people and influenced by their values and culture (Philips & Soltis 1998).

6.9 Translating constructivism

Vygotsky's social development theory discussed earlier is based on the idea that human learning is dependent on the learner's interaction with their own social and cultural environment and that learners are active participants in their own learning. Bruner (1966; 1986; 1990) applied the metaphor of scaffolds to Vygotsky's concept of the zone of proximal development. To develop the concept of scaffolding, the temporary support that a more knowledgeable other gives a

learner to construct and extend his or her skills. As the learner gains competence, the support is gradually removed. The role of the instructor, in this situation, is that of a guide for stimulation of critical and analytical thought, rather than the source of all information or information dictator, to translate information to be learned into a format appropriate to the learner's current state of understanding. Bruner (1966) states that a theory of instruction should address four major features:

- predisposition towards learning;
- the ways in which a body of knowledge can be structured so that it can be most readily grasped by the learner;
- the most effective sequences in which to present material;
- the nature and pacing of rewards and punishments. Good methods for structuring knowledge should result in simplifying, generating new propositions, and increasing the manipulation of information. (1966:40).

In his more recent work, Bruner (1990) has expanded his theoretical framework to encompass the social and cultural aspects of learning. Instruction needs to be concerned with the experiences and context that make the student willing and able to learn. In addition, learning material should be organised in a spiral manner so that the student continually builds upon what they have already learned. The implication of this in instructional design is that the learner who aims to solve a problem or activity would do so by applying approaches they know and integrate new approaches presented to them by the instructor for the current situation. Through integration, the learner balances the approaches to construct a new level of understanding. As Bruning, Schraw & Ronning, (1999) explain,

The aim of teaching, from a constructivist perspective, is not so much to transmit information, but rather to encourage knowledge formation and metacognitive processes for judging, organizing, and acquiring new information (1999:215).

The instructor should try encouraging students to discover principles by themselves through active dialog (i.e. Socratic learning). The task of the instructor is to translate information to be learned into a format appropriate to the learner's

current state of understanding. Instruction should be designed to facilitate extrapolation and or fill in the gaps (going beyond the information given). This task is significantly more difficult than in the classical paradigm, because the guidance must be based on understanding cognitive structure or learning styles (Ben-Ari 1998).

To facilitate extrapolation of knowledge, Norman (1991) discusses the issue in the context of menu (selection) mechanisms. Studies show that when people use a menu tree system on a repeated basis their overall performance in using the PC improves. To support this there is a need for consistency in the interface design and structure in the learning content (menu system), giving rise to content familiarity and helping to eliminate obstructions to learning, such navigation. The menu system also supports Bruner's view (1990) who states learning content is designed in order of lower to high skills, presenting content in a spiral manner. However, according to Knowles (1988) adults need the opportunity to build upon previous knowledge while avoiding repetition of information the learner already possess. Therefore, it is suggested that the learner has the opportunity to commence learning or training at the point at which their needs analysis has determined. Training should commence at a point in the curriculum where new knowledge can be constructed by the learner. Indeed, the menu structure supported by modularisation and learning objectives will allow the learner to go into a particular point of the structure and commence learning.

Kanuka and Anderson (1999) contend that it is constructivism, a view of instructivism, where mastery of facts and skills is de-emphasised. To avoid this learning opportunities should provide a wide array of intellectual pursuits from which the student may choose. There needs to be emphasis is on development of creativity, critical thinking skills and interaction supporting the student's developing self-esteem. The student's ideas, language, and culture need to be respected and appreciated. Academic inquiry follows the student's interests and orientations. Duffy and Jonassen (1992) argue that using an instructional systems design model can be useful to designers to systematically identify what is to be taught, determine how it would be taught, and evaluate the instruction to determine effectiveness. To do so, instructors need to consider both what is to be learnt and

the assumed prior knowledge. The process enables the development of learning objectives which need to be organised sequentially from lower order to higher order learning (Bruning, Schraw & Ronning 1999). Horton (2000) adds that adults need objectives to determine the value of what is being taught and its relevance to their needs. Furthermore, the learning objectives need to focus on the required skills (Reeves & Reeves 1997), thus aligning the objectives with learning content, assessment and evaluation (Biggs 1999).

Experiential Learning theories, such as Rogers (1969) and Kolb (1984) emphasise the importance of actually doing a task in order to learn it and are interested in the ways which experiences motivate individuals and facilitate learning. They believe that people have a natural inclination to learn in order to change and grow. Learning must address the needs and wants of the learner and take place in an environment where threats of failure are reduced to a minimum. Theories about experiential learning are important components of change management. In order for SMEs to accept the need for training, culture of the organisation needs change to support this need and a change of practices that embed training as a function of the business. Several authors have depicted learning as a wheel emphasising the continuous, cyclical nature of the process (Engestrom 2001; Kolb 1984).

The concept of learning styles is an important development as it helps us to understand “how people learn from experience” (Reid & Barrington 1997:88). The term learning styles is closely associated with Kolb’s model, and is loosely considered a cognitive theory. Coffield *et al.* (2004) published a review of literature relating to learning styles which included an analysis of thirteen influential models. The report concluded that it matters fundamentally which instrument is chosen. In deciding which approach to adopt, a number of issues should be considered. Firstly, our learners come from a variety of backgrounds, which, includes those who have undertaken training courses in the past and those who have not. Academic ability also differs amongst the learners and this is reflected through the small amount of post-16 training undertaken. Coffield *et al.* (2004) presented taxonomy of learning styles (*ibid.*:46), considering this the parameters of our search for the most applicable learning style for our training programme can be refined.

The use and administration of a learning style should be integrated with pre existing learning content. The integration of learning styles needs to easily blend with this, providing a seamless package. It will be the presentation of the learning content that would be tailored to address learning style rather than the design of the learning content to address learning style. Kolb (2000) states learning style is not a fixed trait, but a differential preference for learning. This can change depending upon the environment, however there still is a degree of long-term stability in learning style. Considering this Honey and Mumford's (1992) view on learning style, which is informed by Kolb's work, Kolb's approach to learning is utilised as part of the instructional design

Kolb's arrived after initial research at four basic learning styles, stating that to be effective, learners need four complementary kinds of abilities. The learning process has four distinct stages:

1. Concrete Experience.
2. Reflective Observation.
3. Abstract Conceptualisation.
4. Active experimentation (Kolb 2000).

Kolb suggests that people who learn through practical methods (watching) can become reflectors (thinking) through reflection, and theorists (feeling) will guide future activity (doing) and hence new experiences. Honey and Mumford (1992) take this a step further and define learners as Activist (active learners), Reflectors (observational learners), Theorists (adapt and integrate observations) and Pragmatists (Experimenters). Through the process of data gathering, questioning and reflection, new concepts can be generated which, for SMEs, will help generate new ideas and business solutions in new situations. However, the model lacks clarity over what drives the learning process, fundamentally, that need for learning needs to be grounded in experience. Similarly, Piaget described intelligence, as the result of the interaction of the person and the environment. The implication of learning styles informing instructional design, content should be presented in such a way that it takes the learner from whichever stage of

understanding they are at, to Active Experimentation where, the learner is able to carry out a task by themselves and apply to different context. This is particularly important for manufacturing employees who need to develop a skill set, which is adaptable to the environment. However, skills development cannot be done in isolation. The social interaction vital in social constructivism requires that learners' knowledge is "negotiated through conversation and conversation, in turn, is the external reality" (Kanuka & Anderson 1999:9). Also, knowledge is "constructed socially, though everyone has different social experiences resulting in multiple realities (ibid.).

Situated learning theories suggest that, professional learning seems to be most effective when it takes place through interactions within and across professional learning communities (PLC). These can be defined as:

... an inclusive group of people motivated by a shared learning vision, who support and work with each other, finding, inside and outside their immediate community, to enquire on their practice and together learn new and better approaches that will enhance [the individual's] learning (Bolam *et al.* 2005)

Though PLC's are related mainly to education and schooling, they do consider how to improve learning for any group of workers. The characteristics of PLC are reminiscent of CoPs (previously discussed in 5.7.3), where participants work collaboratively towards their learning goals. There is commitment to learn through collaborative relationships among the community members. The reflective and iterative means of inquiry enables sustainable and capacity building of knowledge. However, in order for the community to be successful in its goals it requires participation and partnership.

The community focus emphasises mutually supportive relationships and developing shared norms and values (ibid.:7).

Classroom based learning is abstracted as it is away from a context e.g. workplace, therefore application of knowledge cannot be carried out within the classroom with the absence of context. Learning should occur in the context and culture in which the activity will normally take place. Furthermore, Felstead *et al.*

(2005) highlights that it is the 'everyday' learning that is the most helpful for doing the job. In addition,

...[there is] high importance of social relationship and mutual support in helping individual to improve performance at work compared to the relatively low importance attached to qualifications and attendance on courses. (Felstead *et al.* 2005:4)

As considered in the previous chapter, the role of qualification is not usually regarded as paramount by employees though it does have some incentive value. The role of everyday training and learning within the workplace is considered to be a much more effective method of developing knowledge and skills, a notion that is perhaps better suited to the operational demands of an SME. The support of colleagues and management plays a vital role in developing workplace skills (ibid.:16; Skule 2004) and, through the facilitation of information communication, problem solving and innovation such learning can be effective in informing work-based practices (Brown & Duguid 2000).

Skule (2004) presents an interesting set of conditions that, when present in an organisation regardless of industry, promotes informal learning:

- high degree of exposure to changes;
- high degree of exposure to demands;
- managerial responsibilities for the learner;
- extensive professional contacts;
- superior feedback;
- management support for learning;
- rewarding of proficiency (ibid.2004:7).

These conditions are designed to promote the need for learning in the organisation and acceptance of changes in practices. Argyris (1994), Schon (1983) and Senge (1990) have long asserted that organisational learning promotes creativity and innovation. To allow individuals scope for innovation, it is important to give learners opportunities for decision-making and problem solving. Support, feedback and reward are key to Skule's conditions. It is important to

support learning, and an environment cohesive to learning is a strong motivating factor learners. Incentives such as higher wages or new responsibilities are encouraged by Skule, reminiscent of operant conditioning.

The development of a community of learners within the workplace would help to support learning efforts (Lehaney *et al.* 2004; Chen *et al.* 2006). A learner should communicate with others, with the perception of moving from novice outsider to the core of the community as the learner gains more understanding. Cognitive apprenticeship (Brown, Collins & Duguid 1989) sought to provide a situation in which the learner is brought into a domain as an apprentice and learns from those in the community with more knowledge. The method uses authentic practises to make the experience as close to the reality as possible. Evidence for such practice can be seen in student industrial placements. Eraut *et al.* (1998) report considerable learning also occurs in a typical workplace environment informally from consultation and collaboration with other people within the immediate working group. This supports the view presented by Wenger (1998b) that CoPs can be used for reflection and assimilation of knowledge enabling learners to arrive at a new level of understanding to inform work-based practices.

The use of online learning tools such as email and the discussion forums for communication and collaboration, permit learners to exchange information, views and ideas, tools but require careful utilisation. Raelin (2000) argues that scope for private reflection amongst learners, though virtual learning environments (VLE), may not be a conducive environment for public reflection on participant work-based practices and assumptions. The reason for this is the absence of non-verbal cues and a reduction in the exchange of socio-cultural information. However, this does not discount the use of collaborative tools but simply a note of caution that development of virtual groups may be slow and such the exchange of views delayed. Wenger, McDermott & Synder (2002) present three phases that include five stages, representing the lifecycle of a community. The phases and stages are described as:

1. Formation (potential and coalescing): Developments of networks and commonality and relationships are formed.
2. Integration (maturing and stewardship): Focus on particular topics and the admission of new members with new ideas. Tools and methods are developed that are unique to the community.
3. Transformation (transformation): The life of the community starts to come to an end, or merges with other communities or become formal units.

Although the development of communities can be a slow process using tools such as email and discussion forums, this does not prevent a virtual learning community moving through stages defined above. Furthermore, face-to-face interaction can open up an additional avenue for dialogue, a CoP physically and virtually will help to ensure that those learners who lack the confidence in using online forums or email will be given the opportunity to collaborate face to face. They will retain the same advantage as other learners.

6.9.1 Using Constructivism For Instructional Design

The use of a Learning Management System (LMS) works by supporting the functionality of training. An LMS is a software application that automates the administration, tracking, and reporting of training events. The use of learning management systems enables very accurate data to be captured on the learner's progress. This information can be used by managers to help support employees in their training and determine if training programs are making the necessary impact on business objectives. Put simply, the LMS, acts as an electronic teaching assistant, registrar and administrator. The Registration, Routing and Reporting functions provide a powerful tool for both instructors and line managers to check learner progress to provide the necessary additional support to manage training (Brogan 1999). Businesses that purchase training off the shelf have the option as to whether they would like an LMS. Though purchased at an additional cost it is a valuable tool to help manage individual learners.

Table 8 below summarises the instructional design principles that have been extracted from our understanding of constructivism. These generic guidelines are

designed to ensure that the training programme optimises the learning experience, provides opportunities for JIT learning but at the same time places emphasis on deep learning.

Table 8: Using Constructivism For Online Learning

	<u>Guideline</u>
Social Interaction	Provide opportunities for interaction between the learner and instructors. Discussion groups or forums among the learners both with employees in the same organisation and outside the organisation (informal learning). These provide avenues for reflection and quantification of understanding.
Active Learning	Promote active learning, through the use of practical activities, however they need to be relevant to work-based practices.
Alignment	Determine alignment between learners' learning requirement and the organisations' requirement. This should be further supported by learning objectives and assessment.
Learning Objectives	Set measurable learning objectives or targets that can be monitor by both the instructor as well as the learner.
Learning Styles	Present tasks and information to address the four defined learning styles. The training needs to be a blend of approaches ranging from static information presentation to active problem solving and experimentation. However, all task need to relate back to the work practices of the SME.
JIT learning	Provide the learners the opportunity of restarting the training at any given point in the content and return to that point as many times as necessary.
Previous knowledge	Present learning content by considering previous knowledge. Learning content needs to relate to learner's experience to allow for the construction of meaning and understanding.
Why are we learning what	Set out missions and objectives clearly at the beginning of the session.

we are learning?	Determine the fit of the learner and organisation understanding the learners' requirement needs to fit in with the organisation's missions and objectives. Set measurable objectives or targets that can be tested in order to determine you are teaching the learner effectively. The learning trail needs to be auditable.
Deep Learning	Promote deep learning by ensuring the hierarchy is not too deep or overly complex. As clarity of intention i.e. what am I suppose to do, would be lost.
Learning Management	Establish a learning trail that is auditable to allow for reviews. The use of a Learning Management System (LMS) would allow to you monitor learners progress.
Design	Allow within the design the incorporation of new material, to ensure that the information is up to date also be ability to add new training programmes.
Incentives	Incentives for learning can be in a variety of forms from promotion, monetary incentives or qualifications. The issue to consider is that whatever form is adopted, it needs to have value for the learner.

6.10 Reflections

The end of this chapter marks the first stage in the systematic development of a web based training solution for SMEs. As a starting point in training design, a preliminary model has been developed bringing together the findings from the previous chapters. The preliminary design (Figure 16) was used as the framework to develop the training programme for SMEs as part of the Cawskills project. Findings from the Cawskills project are detailed in the next chapter.

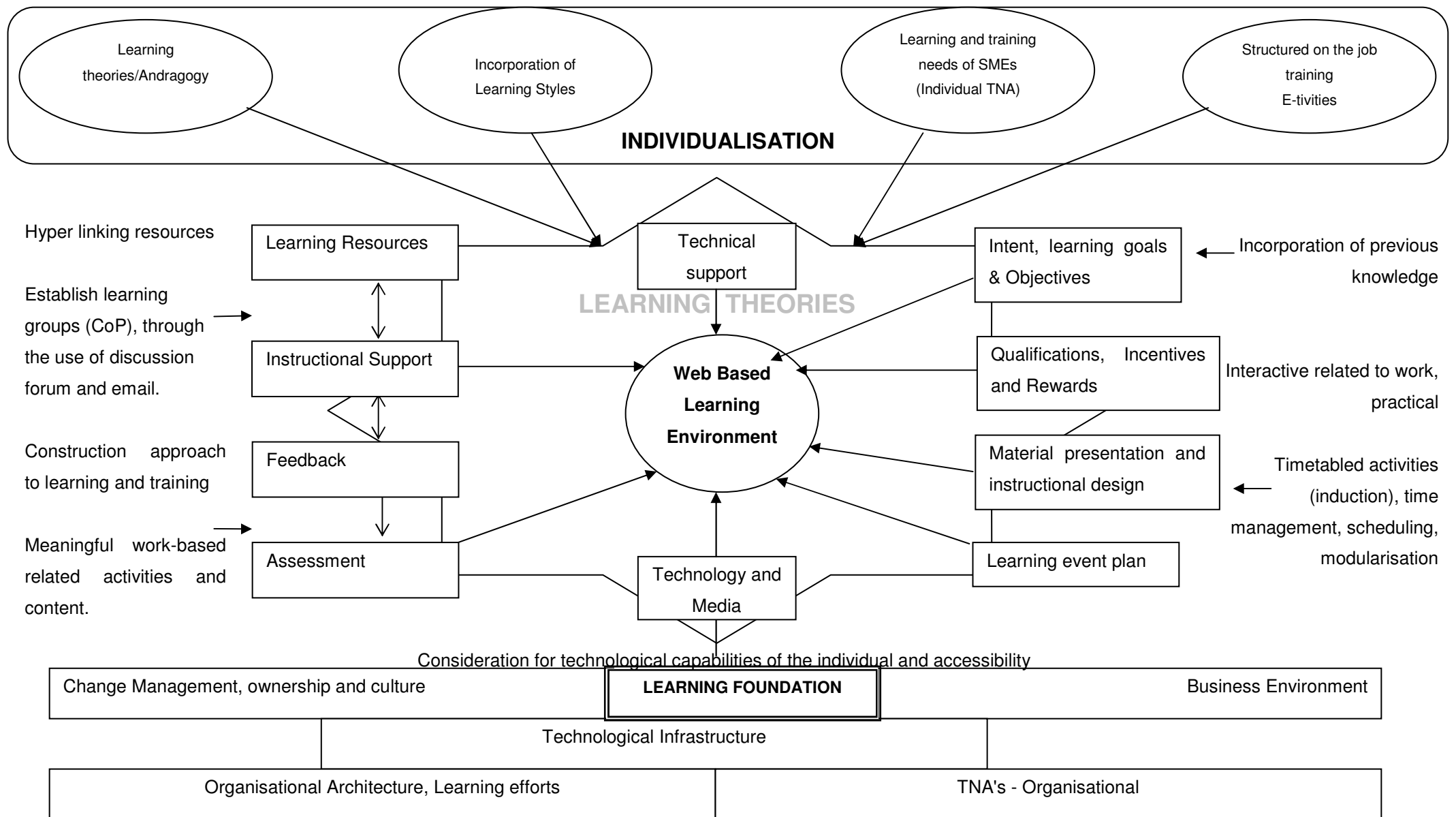


Figure 16: Preliminary Design

The preliminary design (Figure 16) combines three aspects: Learning Foundation; Learning Theories and Individualisation. The Learning Foundation focuses upon the business as a whole and considers the readiness of the SME for training. Aspects such as culture, understanding the future direction of the business and mapping of previous training are just some the areas that are of focus in this part of the training design.

The second aspect Learning Theories draws together the three crucial guidelines from chapter six. The intention of sections 6.6.5. , 6.7.2 and 6.8.1 is to draw out those characteristics from Behaviourism, Cognition and Constructivism, which are considered crucial in the development of the training programme.

The final aspect of the preliminary design is Individualisation. Chapter four highlighted the key difference between tailored training and off the shelf training, and that is relevance. Individualisation's premise is to ensure that the training programme is relevant to the business and specific for the employer. It is important to have a constructive programme, one that builds a new level of knowledge and at the same time allows the individual to learn at their own pace, to balance work commitments.

The preliminary design makes explicit factors that need to be considered in the training design process. At this stage the design is very detailed with descriptive information relating to Learning Theories. It is intended that once the design has been utilised, through reflective practice the design will be refined to make it more specific and directive.

The following chapter details the empirical research and the first use of the preliminary design. The process of developing of a training programme using this initial design and reflection will help to highlight areas that require redesigning.

6.11 Conclusion

In this chapter, we have developed three sets of instructional guidelines to be used when tailoring the learning content and developing the Learning Portal. The

guidelines have been considered from three Pedagogic principles: Behaviourism; Cognition and Constructivism. As the research is looking to train adults, an added dimension, Andragogy has also been encapsulated as part of the final guidelines. These learners differentiate from other learners, in that they have valid prior knowledge and experience.

The application of learning theories to instructional design can help to optimise the learning experience. However, with the array of learning theories, it is difficult to determine which should be used in the training. The popularity of constructivism and its use in adult learning has gained much interest and clearly has a place in instructional design of online learning. Adult learning should incorporate online instructional design principles and an understanding of how adults learn: the pedagogy and andragogy. In addition, though an individual may have a number of training requirements not all requirements need to be fulfilled through work-based training. The priority of training needs to link to the requirements of the organisation and fit into the direction the SME is going. As considered in section 4.14., the use of MoSCoW prioritisation rules can prove to be a useful technique to determine which of the training requirements need to be addressed.

The development of the training portal would ultimately bring together a number of components for a complete package. The components would be: The Learning Content; Communication Support; Technical Support; and Learning Management. Training requires much support in order for it to be successful. This support mechanism should not only support learning, but facilitate reflection and collaboration. The use of email and discussion forums can be used through the direction of participants, E – Moderator and Employers, to be a powerful set of tools to promote collaboratively learning and collaborative working. The exchange of ideas between learners using these tools would help to promote learning and encourage the sharing of ideas.

The emphasis of deep learning is on depth of learning, rather than breadth of coverage. If values are to be changed, learning tasks need to be meaningful and appropriate to background knowledge with the focus on highest conceptual level. The intrinsic motivation enforcing deep learning needs to be encouraged in

organisational learning to empower employees to challenge work-based practices currently used. The desire to effectively improve practices in the light of changing trends, technology and competition can only take place when employees have the knowledge and ability to make informed decisions.

The next chapter will use the preliminary design and apply it to the Cawskills project, a training programme for SMEs within Manufacturing. Findings from this project and reflections from the application of the preliminary design will be used to refine the design to provide a final training model.

CHAPTER 7 COLLABORATION

7.1 Introduction

The combination of literature about work-based learning, e-learning and learning theories have been brought together for this chapter. The Preliminary Design detailed in the previous chapter has been utilised to develop a training programme for SMEs.

This chapter details the results of work carried out with two collaborators who work with manufacturing companies in Coventry and Warwickshire. The work with the collaborators is based upon building the Learning Foundation and bringing together Adult learning theories that have been explored in previous chapters and building generic guidelines to deliver training to manufacturing SMEs.

The fieldwork carried out, helped to isolate trends in the learning requirements of SMEs. These were used, once informed by the organisation's strategic direction, to develop a specific online training programme for work-based learning. The next chapter presents the finalised guidelines based on the work carried out with collaborators.

7.2 Methodology

This chapter is the culmination of a literature review that has provided a theoretical grounding to allow for the development of the preliminary model. The model was utilised to develop an online training programme for SMEs within manufacturing.

The purpose of the empirical research is two-fold. Firstly, there was a need to ascertain what the learning requirements are of the test group of SMEs. Secondly, having developed a preliminary model utilise it to build the online training programme. The preliminary design combines amongst other elements, S-OJT, E-tivities and the three sets of generic guidelines from chapter six. The design makes explicit factors that need to be considered in the training design

process. However, as already mentioned this is a theoretical model. Its application will highlight design errors and lead to a finalised model.

As described in chapter two, the iterative nature of Action Research has been utilised in this research. The process of critical reflection, strategy, action and evaluation will provide refinement of the training model. The reflection takes place at varying stages in development. Once SMEs with ProEnviro have completed their training, post training evaluation in the form of semi – structured interviews, provides valuable insight of experiences however positive or negative. about training experience helps to highlight areas of modification. Fieldwork with CW2000 has a number of reflections. Firstly, a focus group of SMEs who are in the middle of training provides early indications of experience and problem areas. Completion of training and an evaluation of the SMEs and employees training views add to the wealth of data collected to help refine the training programme design.

The next section discusses the processes and outcome in understanding the learning requirements of SMEs in Coventry and Warwickshire. Collaboration with ProEnviro, established an understanding of issues surrounding these companies, along with the learning requirements of individual's and the organisation have helped to refine the training model developed. An understanding of the learning requirements was used as the basis for collaboration with CW2000. The development of a training portal for CW2000 was a year-long initiative that once complete enabled 529 employees across 183 companies, take European Computer Driving Licence (ECDL) training online, within the workplace.

The model (Figure 17) below has been taken from chapter two. The extract depicts elements that have informed the development of a training programme executed in collaboration with ProEnviro and CW2000. The completion of this chapter ultimately lead to designing the 'Post Collaboration Model '.

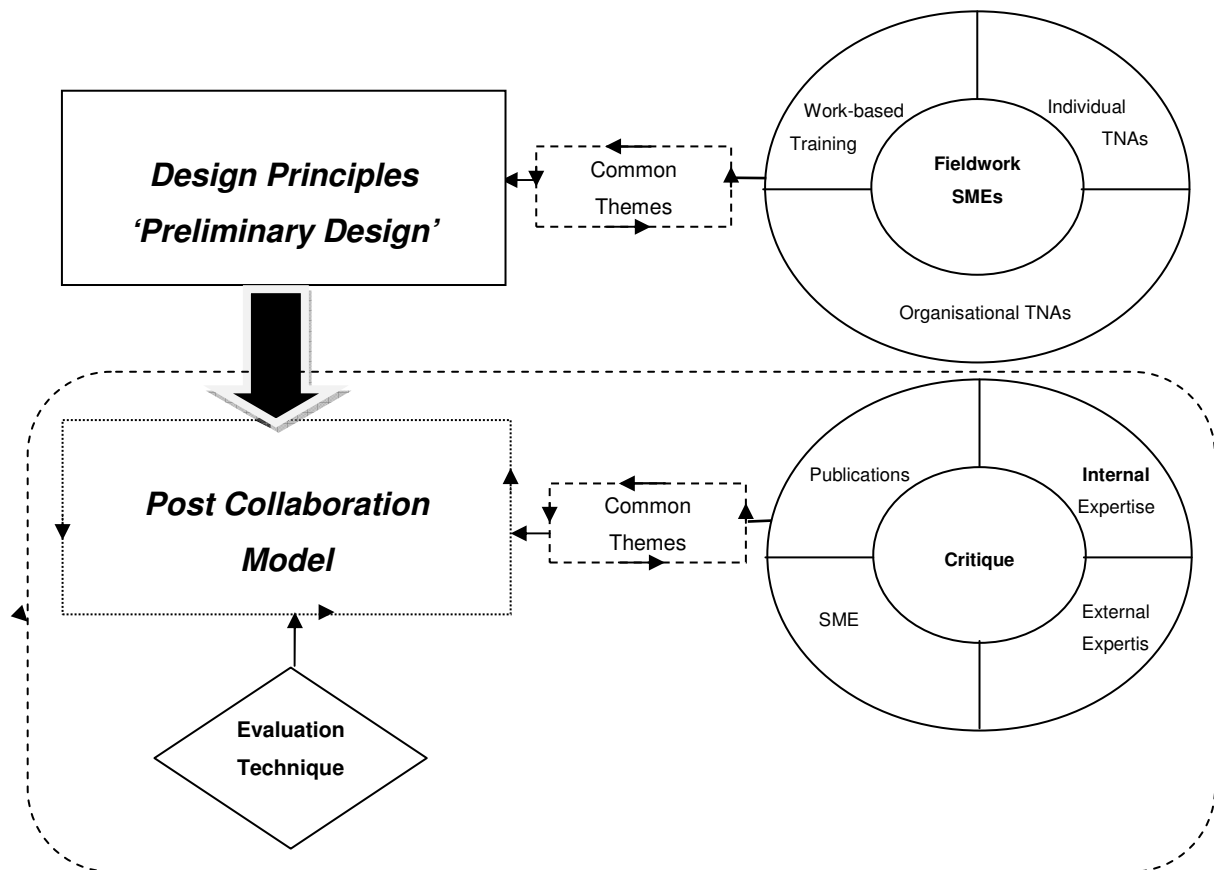


Figure 17: Chapter 7, Research Design

The model shows Work- Based training, Organisational and Individual TNAs informing the Preliminary Design. In order to refine the preliminary model an understanding of SMEs learning requirements, both on individual and organisational level, needs to be established. The approach taken for the Training Needs Analysis has been detailed in section 7.4 . The purpose of the TNAs is it provides a platform of learning needs upon which the programme will be built. It was argued in chapter six and seven learning needs to be constructive and build on previous knowledge. Training Needs Analysis is a method whereby an assessment is made of future learning and training needs.

The next step, once the learning needs are established, was to commence building the programme. As discussed in chapter five, S-OJT and E-tivities will be brought together in the development of the programme. Also, it has been deduced in chapter five that the use of off the shelf learning content be used rather than designing and building bespoke programmes. Fieldwork conducted with

ProEnviro focuses upon establishing an understanding of the individual and organisation learning needs and how the two fit together to fulfil the business objectives. Fieldwork with CW2000 takes this understanding a step further and seeks to deliver the training required by SMEs and the reflections will help to refine the training design.

As discussed in chapter two, the inductive and exploratory nature of this research drives that need for analysis, testing, evaluation and refinement. As such, the development of a training programme that tests the model design is imperative if the final model is to be reliable and valid.

The 'Common Themes' is a process of reflection that aims to draw together those elements deemed necessary in the training model design. Once complete an evaluation of the training programme using Kirkpatrick Evaluation method as determined in the chapter four, will help to determine whether the programme achieves its purpose. Refinement of the model and generic guidelines, will help to tailor the design of the model to ensure its validity and relevance. Reflections or section 7.7, documents the elements of this chapter, which are considered vital in shaping the training. It presents the results from the evaluation process that necessitates change of the Preliminary model with justification of those changes.

The fieldwork carried out with Pro Enviro and Cawskills differed greatly. Work with ProEnviro was based on Ethnography (as detailed in Chapter 2). Observations were carried out over a year, to understand how SMEs train, how and why they train, how is the training used by the business, but more importantly, to what extent the literature portrays reality. The Preliminary model detailed in the previous chapter was not used in its entirety to develop a training programme with ProEnviro. Though, web based training was delivered to SMEs, it was not as a result of a programme developed from this research. The preliminary model was utilised within the Cawskills project along with the data collected from the initial fieldwork. As part of a team, a training programme was developed. The references in this chapter to 'research', is explicit of the contribution of this research to the development of the training programme.

7.3 ProEnviro

In order to understand to what extent the literature portrayed the reality of training fieldwork with SMEs training was vital. A test bed of data consisting of training needs was required for the basis of this research. It would have been a long a difficult process in approaching SMEs on an individual basis encouraging them to participate in this research. Therefore, it was deemed necessary to establish links with companies that have already established links with SMEs of the local area, as appose to trying to approach them on an individual basis, which would be a very slow process. Work has been carried out collaboratively with ProEnviro, a consultancy company in Coventry that specialises in delivering training for the manufacturing industry. Over the years, the organisation established a number of links with the business community. ProEnviro have successfully secured funding from the European Social Fund under the umbrella of Objective 3 in order to assist SMEs in the West Midlands area with their training requirements, towards business competitiveness. Objective 3 can be defined as,

Combating long term unemployment facilitating the integration into working life of young people and those exposed to exclusion from the labour market (Europa 2000:15).

The funds enabled ProEnviro to offer a variety of highly subsidised training courses and National Vocational Qualifications to eligible companies within the scope of the project. This covers Information Technology, Performing Manufacturing Operations and Management skills. A project was devised from this funding, called the AKC Adaptability. SMEs on Bayton Road were mail shot to create awareness for the project. Those employers interested in developing their workforce skills were invited to participate in the project to receive subsidised training.

The target area for this project is Bayton Road Industrial Park in Coventry. The site hosts approximately 175 manufacturing companies⁶, ranging from Metal Finishers to Beauty Products wholesalers. Collectively, they are referred to as the

⁶ Bayton Road Group Website, a listing of the organisations found at this site URL: <http://www.baytonroad.co.uk> [January 2006]

Bayton Road Group. This group of Manufacturing SMEs are the focus for this research. For this research 120 employees have been enlisted across 15 SMEs, for which training needs analysis were conducted. For the purpose of this research, a two-fold approach to understanding the training and learning needs of SMEs and employees in those organisations.

7.4 Training Needs Analysis Approach

Training Needs Analysis (TNA) carried out for SMEs in this project has been conducted in two parts. The first part looks at the organisation as a whole and analyses the organisation in terms of,

- the nature of the business;
- roles and responsibilities;
- problems confronting the organisation;
- information technology uses and policies in place;
- future outlook of the organisation.

The second part of the TNA looks at individuals (120 employees) in the organisation. The second TNA focuses on:

- the role and responsibility of the employee?
- how they carry out their responsibility?
- the skills requirement of their job?
- the required performance level?
- problems or difficulty experienced in the job?

The approach to Training Needs Analysis was based on the Training Wheel (Bee & Bee 1994:5) often used by Human Resource managers when looking at training employees in relation to business needs. The training wheel identifies six main stages to the analysis:

1. Business Needs.
2. Identify Training Needs.
3. Specify Training Needs.
4. Translating Training into Action.
5. Planning the Training.
6. Evaluating the Training.

Figure 18 models the Training wheel and the six stages mentioned above.

Figure 18: The Training Wheel Used To Identify Business Needs

In order to identify and specify training needs, two questionnaires were produced. The first questionnaire (Appendix 4) was used to identify organisational problems and to paint a picture of what the company does and the problems it faces. This questionnaire looked at the following aspects of the organisation:

- mission statements; } nature of the business and strategic direction
- aims and objectives; }
- policies in place;
- accreditation;
- organisational structure;
- roles and responsibilities of people in the organisational chart;
- political, economical, social and technological issues facing the company;
- the use of IT in general and the technical details relating to the use of IT such as the networks in place;
- future outlook.

The purpose of these TNA's was firstly to identify requirements of a targeted selection of SMEs in the manufacturing sector and to construct a framework (themes and content) for generic training modules that would meet these training requirements. Analysis of the TNAs revealed individuals with many training requirements the results, which are detailed in the next section. A second questionnaire (Appendix 6) focused on individuals identified from the first TNA, their skills and abilities required in their job and skills, experience and training already gained. Following on from these activities a model has been produced

using knowledge gained illustrating the variety of components, a web-based training solution will have (Chapter 6). Clusters of SMEs have been identified from this research that have similar training needs. One such cluster is SMEs who need to enhance their ICT skills. Fieldwork with a cluster of SMEs will allow for an evaluation of the methodology and through a process of reflection and iteration modification can take place. The evaluation phase will carry forward the finalised version of the web-based training model.

7.4.1 Organisational Training Requirements

As mentioned in the previous section an organisational TNA was carried out. This section presents the results of this type of needs analysis, completed in collaboration with ProEnviro. The 15 companies who are part of this research have an appreciation for the need for training, however exactly what that training is, is rather unfocused. Some of SMEs have also put forward a number of their employees, who they believe require training in a particular area. In addition to the reasons already identified as to why training is required, there are general reasons, applicable for all SMEs for the need for training:

- increase job satisfaction and morale among employees;
- increase employee motivation;
- increase efficiency in processes, resulting in financial gain;
- increase capacity to adopt new technologies and methods;
- increase innovation in strategies and products;
- reduce employee turnover;
- enhance company image;
- better risk management.

The extent and type of training required had varied. Of all the organisations targeted, only one had a mission statement, which generally looked at giving a good level of service to the customer. However, this was not reflected in the aim or objectives. Despite all SMEs having aims and objectives, they were not necessarily reflective, in terms of the future direction of the company. It was noted, that these companies were functioning at an operational level as opposed to

tactical or strategic level, as it would be in large enterprises. Retaining competitive advantage seemed to be their main objective. Most of the organisational structures were relatively flat with two to four layers in the hierarchy. The structures contained few managerial positions and more operational level employees (Samra 2001).

There is a strong drive for ISO9000 and ISO14000 accreditation. Much of this drive comes from the supply chain imposing quality control systems onto the SME. The customers and suppliers of the SME, as they have accreditation themselves, particularly ISO9000 demand the same level of quality from the SME, which ensures quality throughout their operations and hence require the same level quality from the SME. However, many of the companies are unsure how to incorporate it in the business functions and what its impact would be. Therefore, the training that is devised is mainly in terms of Auditing and Management Systems. Assistance is given in understanding the requirements of being accredited as ISO9000 or ISO14000 and advising the SME in how to maintain or obtain accreditation. An important aspect of the accreditation is an understanding of operations in the business and ways in which to ensure quality is present throughout. Performing Manufacturing Operations is a course offered that focuses on the above. Understanding the Health and Safety issues in the workplace, building assembly and products are key issues that are focus areas in the course. Therefore, for factory floor workers in preparation for the fore mentioned accreditation, an understanding of operations needs to be laid as a foundation.

The current training needs profile within the organisations varies with a high proportion of the SMEs with no training policies, written or otherwise. The organisations had a mixed response to the use of training, they did not feel that the training in general would be of value to the company. They were reluctant to allow for "too much training", in fear of losing the employee to other organisations. They could not see how training, if not relevant to the employee's current job role, could possibly add value to the organisation. Those employers who did allow for job related training to take place did not appraise the individual to determine the value of the training for their job. Time was the biggest factor in this situation. Training would normally be taken during work hours, an expense to the company

who would be paying the employee even though they did not work during training. Once training was complete, the individual would return to their job. Discussing the efficiency of training with the individual and the value it would add to the job, what changes can be made, would never be discussed.

7.4.2 Individual Training Requirements

The organisational training needs analysis helped to focus the future direction of the business. This was used to align individual training needs (results from the second questionnaire) as these requirements would help to fulfil the strategic aim of the business. All training proposed was such that they related to the business aims and objectives.

Research has shown that certain sections of the workforce are more vulnerable to the changing structures and consequent skills need of the labour market. Such groups at risk of changes identified during the fieldwork are as follows:

- **Clerical And Secretarial Workers** - workers in this group have a need to adapt to new IT systems that will cut out more traditional tasks. These workers require a broader understanding of systems to undertake a wider range of tasks.
- **Craft And Skilled Manual Workers** - a transition to services and upgrade in skills to deal with more advanced technology has been necessary, with an increasing emphasis placed on understanding and managing systems.
- **Supervisory Management** – with a transition from production based to service based, an improvement in basic literacy, numeracy, general communication, interpersonal and customer care skills is required. IT skills and communication skills need to be adapted to new technologies and working practices.
- **Management Or Directors** - with a high level of competition management focus is on fulfilment of customer demand, generating business and to keep

one step ahead of competitors. Little time is spent in analysing management systems, workflow, and organisational issues. Stepping back and looking at the process in place is rarely conducted because of factors such as time and work demands. These people require an understanding of process flow, organisation skills and management skills.

The training needs of these groups of employees were sub-divided into four areas: ICT; Leadership Skills, Supervisor Skills, Management Skills. There were three emerging issues from the skills requirements identified. Firstly, catering for employee needs, i.e. "to use this new software, I need to learn how to use it"; Secondly, how to enhance the skills of individuals in relation to their job role and thirdly, and thirdly, how to provide the opportunity for skills acquisition and development.

ICT training was one of the most popular training requirements not only for novice users who did not always have the basic keyboard skills, but also for advance users. IT training was not only for individuals (mainly office staff) to do their job more effectively, for which qualifications were being sought, but also for factory floor workers who do not use PCs in their day to day job.

Objective 3, states there is a need to aid those exposed to exclusion from the labour market. Of the above it is recognised that factory floor workers would come under Objective 3. Acquiring ICT skills would give factory floor workers more opportunity in the labour market. Therefore, this would be seen as a form of learning and self-development, skills being learnt were not going to be used in the work situation immediately, but would be in preparation for the future and within other jobs. However, for office staff this was training, as the knowledge and skills that would be acquired would be used in their job role. There has been a rapid move from manual systems to computerised systems, pushed by both customers and suppliers of the SMEs. Conducting business has become more and more popular by electronic means as opposed to paper based systems. Computerising records has become a necessity in today's business environment. Networks enable collaboration to take place between employees at different locations. As businesses grow there is not necessarily the same level of growth in the number

of people employed in the business. The need to be multi-skilled has become key for an employer when looking to recruit. However, SMEs in this project did not all conform to this trend. A realisation for the need is present but not the direction to move from realisation to actualisation because of a lack of knowledge in what processes need to be in place and how to move forward from there.

All of the SMEs in this research have and use computers. Managers, directors or administrative staff mainly used the PC for tasks from Word Processing to Manufacturing Control. No IT policies plans or budgets were present for any of the SMEs. Most of the employees have basic or no skills in using PCs, however the perception of managers or directors for training in IT was mainly driven by request and not by identified business needs.

One particular SME will be relocating within the next six months more than fifty miles from their current location. Some employees will also move with the company, however, many particularly, the factory floor workers will not be able to move with the business. When the possibility of training was introduced to the SME, it was seen as an opportunity for the people who would remain, to train and develop skills in preparation for application for other positions in the area. Office staff, because of the nature of their work, use software but are restricted in its' application because of their current level of knowledge. This is the general consensus with many SMEs, where knowledge of the tools being used is restricted to what the person knows, which in most cases is very basic.

In relation to this research, the employees who have been proposed for training are mainly Labourers or Factory Floor workers, Administrative staff, Line Managers and Managers and Directors.

- **The Factory Floor Workers** would not necessarily have formal academic qualifications, but are more likely to have had an apprenticeship. Age range is another important issue, ranging from 30 to 64, many of the factory floor workers have been doing their job for many years. They have been in this job or industry for a number of years with little academic qualifications. Their jobs are repetitive, hence have specialised experience in their area of work.

- **The Office Staff** consist of the administrative staff i.e. receptionists, secretaries, and other office workers below managerial level. Those who are formally qualified are most likely to hold vocational qualifications such as RSA in typing skills or NVQ Business Administration. These people have experienced change in their positions since they started work, their jobs have evolved for a number of reasons including: IT advancements; organisational restructuring and changes in job description. Most of them require competence in core office software (typically Word, Excel, Access, PowerPoint, Email and the Internet). The applications are not used to their full potential namely because of the skills and knowledge of users in using the above remains low.
- **Line Managers** have responsibility of not only day to day operations in the business, but are also required to manage the employees working under their direction, to manage work flow and delegate responsibility. Managing personnel for some managers was difficult, understanding processes, people management and communication skills were key, but not always present.
- **Managers and Directors** often lack people management and communication skills. Being able to talk to employees on an appropriate level was difficult for some of the managers and directors. General management was also a problem. A paper-based system for record keeping was present despite availability of PCs to them. Two reasons emerged as being responsible, namely technophobia brought about by the lack of knowledge in how to use the software and secondly the business culture, a reliance on approaches which have always worked in the past. Strategic thinking in this type of role is key, as well as an understanding of the processes, some managers and directors simply did not have this skill.

When the training needs of each SME were complete, the results were analysed to determine if training was required and the training course that would be the best option to satisfy the need. All training proposed was such that they related to the

business aims and objectives. The training needs have been sub-divided into eight areas:

- Microsoft specific.
- General IT.
- IT Administration.
- Web Development.
- Customer Care.
- Management.
- Accounting.
- Job Specific.

76% of the training requirements was for ICT for which software such as Word and Excel were most popular followed by the need for skills in Internet and Email. This included novice users who do not have the basic keyboard skills and for advance users. IT training was not only for individuals (mainly office staff) to do their job more effectively, for which qualifications were being targeted, but also for factory floor workers who do not use PC in their day to day job.

Having considered that ICT is one of the main training requirements AKC Adaptability offered the following programmes to SMEs. ICT Training or courses that were offered were mainly for: Word; Excel; Access; PowerPoint and Web Development. Training would also be given in using the Internet and designing and producing websites (HTML training). The level of training for the above will vary with each individual. Training needs to cater for the individual based on their learning needs and level of support required. SMEs did not necessarily require training that led to a qualification. Office staff worked to a qualification such NVQ Information Technology Level 1 and 2, but what was important in the selection of this course was the presence individuals training being work-based and the opportunity to apply what they have learnt to their job. However, application of skills was not always done. Similarly, there were a number of Line Managers and Directors in organisations that lacked key skills in managing people, activities, resources and information despite they being qualified for it.

A number of Line Managers and Directors of the organisations who lacked such skills reverted back to basic training in how to manage employees more effectively. Again, an NVQ certificate in Management was offered, however, it was not specific to the individual so they can focus on areas they have particular difficulty with. High level Managers or Directors also required training but at a different level compared to Line Managers. This training links in more closely with the processes of the business and the strategic planning of the organisation. Training would be related on Human Resource Management, Managing Finances, Organisational Activities and Planning and General Management skills. A Diploma in Management was offered to Managers and Directors, which looks at these issues and proposes methods to resolve them. This did work well for many individuals. The diploma offered generic basic information on management skills but its drawback was it did not provide a mechanism to relate the information to the SME

7.4.3 Delivery

A learning portal has been developed specifically for all Bayton Road group members. It was proposed that training would be delivered through this portal. The question arising was what material would be on the portal? Secondly, would it be available on the Internet or only within ProEnviro training premises on an Intranet?

As this type of training had never before been provided by the organisation, it was decided as a pilot project to provide the training in-house, on the Intranet, through the portal. The focus of training was on qualifications rather than the delivery mechanism. Supporting material such as handouts would be provided to the trainees. A training suite accommodating 30 PCs would allow for 30 people to train at a time. The courses will be led by a learning facilitator as opposed to teacher where information delivery is one-way. Training would be self-paced and helping each other would be encouraged so as to create a self-help environment. The learning material will all be placed on the portal, with hyperlinks to the Internet and links to other sources, will be common to all courses to allow the trainee to find and read additional information relating to the topic. Once a cluster of similar

training needs had been established, then material would be developed to cater for their specific needs and dates would be set at times suitable for the cluster to attend in-house training. A discussion forum was developed to allow trainees to exchange ideas about best practises, solve problems and answer each other questions. It was decided that the forum would link to the Bayton Road Group forum already in use. Once the training had been complete the trainees could continue to refer to each other for help rather than stopping altogether.

Using WBT would make training material more accessible to the learner as work can be self-paced and this in turn can reduce training delivery time. The training can be carried out both during work hours, enabling the individual to exploit the organisation's Internet and Intranet facilities as well as out of work hours. WBT has brought down the cost of training for example, there is little cost involved in employing a trainer. This has sparked interest with Senior Managers who see this as a cost saving approach to training which adds value to both the organisation and the workforce. Training delivered online can be applicable for a wide range of industries. Not all subjects lend themselves to online learning, although it is capable of playing some part in almost all training. Not surprisingly IT training is the most favoured subject.

Based on the research conducted so far there are key considerations that need to be made in the portal design and use. They are:

- training needs to be work-based. Therefore, it should use curricula customised to the student's prior knowledge;
- commitment from employee and employer to do the work and for the employer to give time to the employee to do the training;
- work-based training could lead to qualifications so as to give long term advantage and incentive for the individual. This is difficult, as many SMEs believe that training leads to the loss of staff. What they fail to understand is the value training brings to the company, such as a lower staff turnover, increased morale and job satisfaction;
- the material designed needs to be such that it can be reused in other training;

- training in future needs to be JIT learning⁷;
- material needs to be secure;
- allow for discussion to take place and self-help groups;
- "the teacher" is a learning facilitator;
- keeping the text minimal and graphical representation maximum. Making the training as practical as possible rather than reading large amounts of texts;
- clear objectives at the beginning of the training;
- feedback needs to be positive and constructive.

There is still much work to be carried out on this project. Delivery of online training is still in its analysis and design stage. Implementing the infrastructure with both the SMEs and ProEnviro will take time. Another difficulty will be changing the culture of how training is perceived and be delivered.

Using the experiences from collaboration with ProEnviro and the data collated the research sought to further refine the preliminary design (Chapter 6).

7.5 CW2000

Having considered the drawbacks from the initial collaboration, it was hoped that with an understanding of some of the training requirements, this collaboration would allow for a more in-depth focus on training design and development. The Cawskills Project⁸ was aimed at combining different strengths of virtual and physical training to deliver a hybrid model of learning accessible to local businesses within the Coventry and Warwickshire area. The four key components of the project were:

1. Training needs analysis to establish the requirements of each company and to give them a structure to manage their training.
2. Provide ICT support and training to be given to individuals from each company via local delivery partners.

⁷ Just In Time Learning - a term used to describe the delivery of information for training as and when required.

⁸ www.cw200.org.uk/cawskills

3. Physical support to be provided at local centres around the region.
4. Online training material to be provided on an independent website.

The training funded by Advantage West Midlands (AWM) was based on material from the European Computer Driving Licence (ECDL) which consists of 7 modules and covers a variety of applications and concepts that are used in personal computing. ECDL is broken down into seven modules which cover the key concepts of computing, they are:

1. Basic concepts of Information Technology.
2. Using the computer and managing files.
3. Word processing.
4. Spreadsheets.
5. Databases.
6. Presentations.
7. Information and Communication.

It also aimed to boost the skill level of the local workforce to increase regional economic activity as set out in the original application including the contribution to the creation of a (virtual) learning network. Other benefits claimed by this project were:

- an increase in employee daily productivity;
- enable a consistent level of IT ability through the company;
- provide evidence of the investment made in staff development;
- improve staff motivation;
- improve staff retention;
- reduce IT support costs.

7.5.1 Project Outputs

The intended outputs were:

- ECDL training for 500 employees who had been recruited via targeted employers;
- management development training for 50 companies and a change management programme for 10 companies;
- 100 SME's assisted;
- 50 organisational TNA's;
- evidence that there is a value to using the hybrid training model of remote delivery and local support;
- a learning cluster – created by the common provision and usage of materials and support.

The majority of the outputs were met and even exceeded with some softer outputs being realised throughout the course of the project. These will be discussed later in this chapter.

7.5.2 Process

CW2000 already has a strong presence within the local business community, having provided broadband access to many SMEs in previous years and keeping them informed of any ICT developments from which they could benefit. Using this network of clients as base, other potential sources were sought which could come from local business centres that had a similar interest in working with local companies. The geographic location of these centres and the business demographics in the surrounding areas, resulted in each centre operating slightly differently to suit their client base.

Similarly to collaboration with ProEnviro, Training Needs Analysis questionnaires were executed for CW2000. This was to provide an comparison the training and learning needs and to identify trends in training to compare and contrast with findings in the literature review. The questionnaires consisted of several areas of interest such as existing IT knowledge, company vision and previous training, and skills requirements in the job and of the individual. The research identified, through

face-to-face consultations, training and learning requirements and establish a framework or training plan for each company to progress by matching individual learning needs and organisational learning needs.

In order to maintain a personal aspect, each centre brought clients to the project with whom they could strengthen relationships and continue to assist in the field of ICT developments. This meant that companies knew a friendly face even if it was on the end of a telephone or email. ICT support was made available from the centres listed below as there were no specific technical resources identified for the project. Most of the technical issues that arose were dealt with by the central administration centre with assistance from partners where necessary. There was also an online support area on the website where students could ask questions of tutors or peers.

Tower Court in Coventry was the central administration point. Other centres used were:

- Business Resource Centre, Rugby;
- Ruralnet Telecottage, Stoneleigh;
- Minerva Mill Innovation Centre, Alcester;
- Bangladeshi Centre, Coventry.

Each training centre forwarded information to the central administration on issues such as SME recruits, arising training issues and training progress at regular intervals. The training centre, which enlisted students, would be responsible for managing them whilst they are taking training. The role of E-moderator was seen as that of the training centre, not only do they have knowledge of the SME but technical understanding of the training content.

7.5.3 Training Needs Analysis Phase Two

TNA's

50 individual and 10 organisational TNA's were conducted. The general feeling was that TNAs are being pushed too hard at people at the moment. There was a high level of exposure to the SMEs about TNAs from local initiatives and as a result many SMEs did not really feel that TNAs were necessary for their organisation. Many companies are too busy to sit down with you for an hour so that you can assess their requirements and many are also sceptical that you are trying to sell them something. The results of the TNAs confirmed the results found from the first set of TNAs with ProEnviro. Despite identifying a variety of training requirements, it was the ICT requirement that were fulfilled with the Cawskills project.

7.5.4 Portal

The development of the portal followed the guidelines as set in chapter six. Once the training vendor was identified, customisation began. Educational Multimedia Corporation (EMC), the training vendor, allowed for very specific changes to be made to the interface design. The first functionality established within the portal was the single access point, which was achieved by Ruralnet. The Cawskills portal requires a user name and password in order for students to access the course material. This unique code allows them to look at both the learning material and an online support area which was combined to create a virtual classroom. Once the students have attended an induction session at their local centre it was then up to them how, when and where they accessed the learning material.

As the learning content was an off the shelf learning package, there was a limit to the number of amendments that could be made to the software. Many of the changes were cosmetic, for instance where there was a lot of information on the screen which was not used, hiding some of it so the user could see the options available to them more clearly, (minimalisation principles were applied) allowed for clear direction. However, it still meant that there were many areas ,which confused the user and so these were used as the basis of what not to have in the design of the portal. In addition to the learning content, EMC also provided the Learning Management System, 'LMS Pinnacle'.

The reporting of the learning package was considered as the most important feature. It was used to track and monitor the progress of each individual student. However, it failed to meet requirements in a number of ways and performed inconsistently, causing severe frustrations and incorrect scoring. Once the extent of the problems had been realised, the trainer vendor was contacted who took away a twenty one page report detailing the problems that was encountered with the product. After a number of months they supplied a “fix” which should have corrected 90% of the problems. In fact, it only resolved one of the many problems and caused more inconsistencies to occur. Overall the satisfaction of their resolutions was extremely poor, and they showed little interest in resolving problems claiming that the training product is being used in a different way to that which it was intended. Students were made aware of some of these as they would come across them as they progressed. The most frequent one was a status which told the student they had failed when the scores evidently showed this was not the case. This was a large de-motivating factor and the fact that it could not be immediately resolved, only added to problems. Another problem with the reporting meant that student reports compiled had to be checked manually, which was very laborious and used up valuable resource.

A number of delays in successfully integrating the learning material and support area caused the project to be put back until it had been fully functional. There was some difficulty with the interface design as it was not easy to follow. To overcome this and to follow the first level of the E-tivities model, it was felt that an induction session would be more appropriate to guide the users through the material step by step and use a user guide which explained the procedures to follow. Passwords and logins were issued during this induction session and student guides and Induction material distributed.

To ensure the portal had an appearance of a complete package it was deemed important that there was a single point to access the training. The common point was integrated by RuralNet whose technical expertise allowed trainees, through the use of logins and passwords, to access the learning materials and the support

environment. Figure 19 shows the different components of the portal and the communication pathways between each of these components.

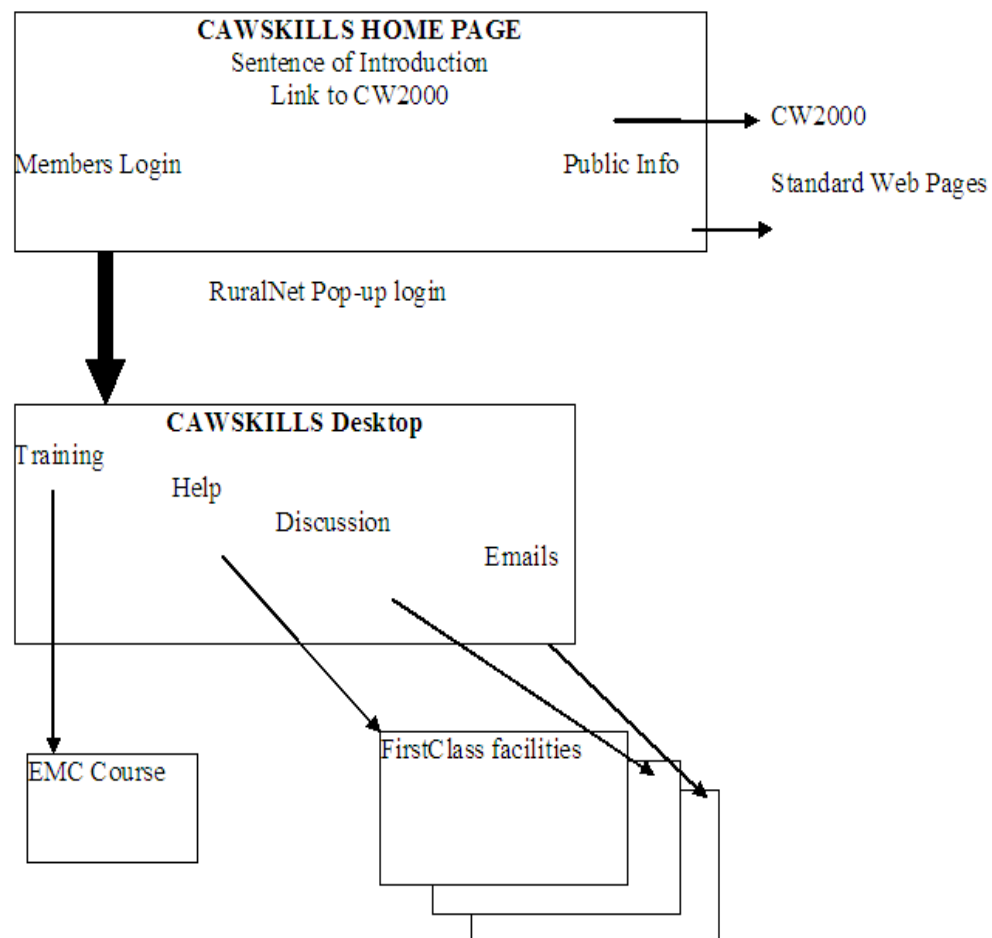


Figure 19: Cawskills Structure

The Learning Support was managed through the use of Help, Discussion Forum and Email, which was provided by RuralNet and their suit of programmes called FirstClass groupware. The overall aim was to manage the separate components while the Cawskills web Environment appeared as a single seamless entity.

The support area took a secondary role to the learning material and was hardly used by students. Feedback showed that many of the students were new to the e-learning concept and to think about asking for help online was a step which they were not yet ready for. It was trying to achieve too much at once. However, those that did use it asked a variety of questions concerning the learning material and technical issues which were dealt with promptly. These students paved the way in

building a community of learners (CoP) supporting each other with the training, motivating one another and exchanging work practice ideas. The use of training centres supported the learning of individuals who found it difficult to use the online support. The face-to-face interaction with tutors and other peers brought a traditional approach to learning and made comfortable those who are more familiar with this technique of learning. This research did not make the suggestion to use training centre, but came about from previous training programs CW2000 ran for SMEs. Their experience found that using the centres gave better accessibility to training and support by the SME.

A vital component of the learning content was a Macromedia web player, which was needed to run the courseware. There were many problems experienced with downloading the web player, 26% of the sampled students had a downloading problem. Although it was an integral part of the material, it did not perform well and created a number of problems. It was also especially slow when used on a dial up modem. Due to the huge technical diversity of computers and connections it was decided to produce a CD ROM to overcome this issue. This was handed out to those who had or would potentially have problems downloading via the Internet and rectified the problem. Another technical issue was some interested companies were turned away due to incompatible software or equipment. The courseware did not work with a Mac machine and is also unsuitable for those using Windows XP. This ruled out quite a few of the larger companies who showed an interest in the project initially.

7.5.5 Centre Progress

There were several centres that collaborated in the Cawskills project. These training centres not only brought SMEs to this project, but provided vital learning support to those SMEs.

South Warwickshire centre (Minerva Mill) was very successful in SME recruitment particularly considering they have previously had little or no funding available for businesses in the area. Many larger SMEs which were approached were already tied into a larger training provider and so did not feel they could take advantage of

this project. This emphasises the fact that larger organisations have a more structured approach to training which is tied into their own strategic development. The nature of these organisations meant they have both time and investment and thus have training as an on-going process. Sole traders or small family business were the main recruits, because of the village location of Minerva Mill, its biggest strength was that it was operating within the community environment and increasingly students began to use it as a drop in centre where they could meet with others in the same situation. This brought about opportunities for networking and built a strong business base in this area and face-to-face training and support. The availability was a coordinated effort of providing online and face-to-face training was well received by employees, according to interim feedback.

Many companies did very well in undertaking the online training. However, there were some students who struggled with the training as they were not motivated. These students did not attend any sessions during the day so evening training sessions were specifically organised for them. This group of students were from the Clothing sectors and English was not their first language. Many of them struggled with the courseware as they were new to IT or had a language barrier which hindered their understanding of the material. However, with the coordinated effort of employers, other trainees and the tutors at the training centre, these students successfully completed the training.

An unexpected difficulty arose relating to the time of year. Seasonal difficulties appeared with most companies, they tended to wait until the end of summer holidays and looking at September, which is traditionally the start of a new academic year, to focus on their training requirements. Also the Christmas period affected training progress, when students were perhaps too busy at home and work to concentrate on training.

7.5.6 Student Problems And Influencing Factors

It was determined by this research that despite a general consensus that training benefits business, there were still some employers that were reluctant to allow their staff time in work to use the computer for training. They wanted their

employees to train, but not during work hours. Rather more, they wanted employees to use their personnel time for training. As mentioned in the last section, these students were mainly from the clothing sector. As the need for training was not being actively encouraged by employers to be done during work hours, the motivation for training during work hours was minimal.

The amount of time it took for each module to be completed varied from between 1 hour to 6 hours depending on previous skills and experience. This alone served as a barrier and the most common form of student feedback received was the there was not enough time to study. The progress of students was very slow due to several factors – time, speed of computer access, motivation, understanding and previous knowledge. Most of these became apparent with interim feedback.

ECDL is made up of seven modules each of which relates to a different area of computing. In putting together the initial bid it was envisaged that a high percentage of students would want to complete the seven modules and go on to gain a formal qualification. In practice this was not been the case. The majority of the students were only interested in one or two modules, those being ones for which the software is used most frequently. They were not all interested in those which they do not use or feel they will not use in the future. This reinforced the Andragogy view, that training provided needs to have immediate relevance. Lack of basic IT skills meant that some people had to be turned away from the ECDL course or signposted to another course before they could be competent enough to use the training material provided. ECDL requires a basic level of usage and is aimed more at people who have used a PC before. This is a potential gap which needs to be plugged before any follow up projects. For those students that successfully completed all of the seven modules certificates were issued which proved their participation in the project and the scores they had achieved for their work. This was well received and helped to recognise achievements of the students.

In order to try and maintain momentum of training a number of student newsletters were produced and even Christmas cards were sent out with subtle reminders. For those who preferred more structured training, regular training sessions were

held, where they focussed on a particular area and worked through the module with a tutor.

7.5.7 Interim Feedback

In order to monitor and measure performance a number of feedback forms were sent out to students (a copy can be found in Appendix 6). These feedback forms were sent out on a number of occasions and asked for any comments (there were 54 students returned the forms). The results were promising, students felt on the whole that the Induction sessions were valuable (94%) and the course easy to follow (70%). Some students stated that meeting other students on the Induction had been useful, but that maybe there could be more email contact from the tutor to get a greater sense of belonging. Furthermore, 83% of students were able to log onto the portal successfully after the induction. The use of the hybrid model for training was particularly beneficial to employees who were more familiar to the more traditional approach to training with 61% stating the use of the training centres and structured training sessions at these centres particularly useful.

There were some problem areas, which the questionnaire was requesting information about, some employees had not come across yet and so could not comment and some flagged problems, which were already made aware of. 57% of students said that they could apply some of what they had learned in their job and 71% said that the biggest barrier to learning was lack of time. Other barriers were job commitment and lack of equipment particularly for labourers. Feedback from students suggested they that students were given more time in working hours to do the course and perhaps more contact from their tutor. The majority of students were happy with the course and the learning material, with comments such “I like the physical demonstration of what I should have done”, “I really enjoy the course, I just need more time to complete it”, being made.

Was ECDL the right thing to promote? According to the feedback, it was well received, it was perceived as a good starting point for those that were interested in learning more about the use of computers. From telephone responses there were

a number of companies who thought it too basic for their requirements or required more specialists training such as engineering companies who were interested in the Computer Aided Design (CAD/CAM) type training. However, an important consideration for this project was the application of knowledge to work-based practises. Data collated for this research found that 55% of students found the training directly applicable to their job and used the training to make changes to their work-based training.

The problems encountered with the LMS software caused a major concern. The problems with the software surfaced quite late in the day and it took a lot of testing to fully uncover what was happening. If this could have been resolved earlier it may have made a difference to the progress of students.

Another issue explored three months into the training was progression rates. Table 9 shows a breakdown of the number of students brought to the project by the different centres and the number of modules successfully completed. Interestingly, of the 562 employees who took this training only 5% dropped out. There was no intention for students to complete all 7 modules, despite the fact this would have been a desirable output, but the completion of at least one module was the minimum target for individuals.

Table 9 : Student Progression Rates

	Not Yet Inducted	Completed a unit within a module	Completed 1 or more modules	Course Completion – 7 modules	Dropped out	TOTAL
Tower Court	84	35	51	9	12	308
Minerva Mill	6	38	47	3	10	130
Business Resource Centre	6	17	9	0	1	42
Ruralnet	6	20	9	0	2	42
Clothing Centre	0	7	6	2	8	40
TOTAL	102	117	122	14	33	562

The fact that there was a long time period for students to complete the training was welcomed by many students. Another factor that made the training successful was the method of delivery. The use of a hybrid model reached out to young employees who are familiar with ICT as well as those are more accustomed to a traditional mode of delivery. However, it was the combination of sounds and video clips and the option to choose both or either was the most important factor helping effective learning.

Each centre had its own learning cluster with individuals from different companies coming together on Induction sessions, providing networking opportunities and chance to exchange ideas. Positive feedback was received regarding prompt response to difficulties and good quality of the learning materials. Essentially, the project as a whole evolved into a learning cluster based on one product. The next envisaged stage to this project is to address the skills gap further and offer a wider range of courses using the hybrid model of learning.

Although the numbers responding to the questionnaire have been low to date and, therefore, results from these cannot be viewed as statistically significant, responses were mostly positive. The support provided by centres and the supporting material produced for students received a number of compliments. Future training using distance learning would need to take account of the importance of connection speeds and note the need for good local support for students.

In addition to considering the views of employees taking training it was also important to look at the views and experiences of employers. The next sections findings from Employer Feedback.

7.5.8 Employer Feedback

Company feedback forms were sent to all of the SMEs who had registered with the Project, after 6 months into the training, amounting to 183 companies. 25 SME replies were received (see Appendix 7) for a list of the questions on the company

feedback form). Overall, feedback was positive, the main areas of criticism being, the speed over a modem connection and the problems/errors in recording test scores. Of the 25 replies received, 20 said that they would be interested in taking part in similar learning programmes.

It was interesting to see of the returned response six SMEs had formal training procedures already in place, for example annual appraisals. Informal procedures pertaining to training were also evident with nine SMEs. The informal procedures in place were training determined by project requirements, informal discussion, knowledge of staff, self-assessment. However, eight had no procedures in place. Two SMEs had declined to answer. This blend of SMEs with vary levels of formalisation of training demonstrates an acceptance that training is of real value for the business. Of the six SMEs who had formal procedures in place, commented they saw a fit with their training needs and one of these seeing the flexibility of the courseware as “a major benefit”. Of those without formal procedures, all thought the Cawskills course was useful for their business.

The benefits of training can only be acknowledged when there are productivity benefits. Of the companies involved in training, 15 reported an improvement, or anticipated improvement in basic computer skills. One SME reported that the computer was now used for “various jobs which up till now were done by hand on paper” and that this was saving office space. Another SME reported improved staff motivation which in the past was low and more effective team building. However, by 6 months into the training four SMEs said it was too early to see any benefits. This was partially due to the employees taking the training had not completed the all required modules and the SME wanted to wait until modules were completed before any evaluation took place.

As the research expected there were problems and concerns relating to the training. To understand what these problems were and isolate feedback for this research, SMEs were encouraged to provide feedback to training centres, who then forwarded the information to central administration, and online via email or discussion forum. The data collated found eleven SMEs reporting no problems with the training, delivery or support. There were some (four) SMEs who reported

problems with speed i.e. the course was too slow downloading. These SMEs had a modem dialup and naturally the multimedia files would take a considerable amount of time to download. As discussed earlier, there were problems with the LMS. Employers confirmed problems their employees had with incorrect results for pre-assessments and module tests. SMEs also had concerns with the amount of time they had to take training. Releasing employees to take time for training was a difficult issue to deal with. Despite this was a problem, many of the employers coordinated efforts to permit employees time for training. On average three hours per module of work time was being given to employees by employers for training.

Of the companies that showed an interest in taking part in similar projects the type of training required covered a number of areas. Some would like to see some more ECDL including upgrade and advanced, some would like web design and CAD, and some would like to see interpersonal skills training. Generally the feeling was that a range of courses could be delivered in the way Cawskills had delivered ECDL.

7.6 Post Training Evaluation

Once the training project came to an end, it was important to determine whether the delivery process, training content and its value to SMEs was positive. The use of Kirkpatrick's training evaluation model was used as it provides insight into the value of the training. The reflective practice at the core of this model would also allow for a review of work-based tasks, change and improvement. Five semi-structured interviews were carried out with SMEs who had completed training as part of Cawskills, to explore the four levels of Kirkpatrick's model. In addition, information generated during the course of the training was used as part of this evaluation. Return on Investment (ROI) was not taken into account as the investment level of the SME was limited because of the funded project.

7.6.1 Reaction

Many problems and concerns during the course of design, development and implementation of the Cawskills programme have been identified by this research. However, the feedback indicates the project was a success and students were generally satisfied that both content and delivery mechanism was appropriate to their needs. Both the employees and employers considered this approach to training useful particularly because of the operational demands placed on the SME. The combination of online learning and face-to-face training sessions, helped those familiar with online training and those who have perhaps had limited exposure to training. The training sessions, such as the Induction, were well received by employees as the immediate support was a reassurance. Employers also considered this beneficial as they felt the training support which they perhaps could not provide was available to employees.

The incorporation of pre-assessment at the beginning of each module was considered useful by employees as the feedback helped to highlight areas where the individual needed to pay extra attention. Though not all employees took advantage of this, those that did, used the feedback to ensure that highlighted areas were covered with more focus.

The ability to take training within the workplace had a mixture of responses. Though workplace learning and training was welcomed by SMEs, it is not without its difficulties. Precedent is always given to work tasks and demands over the training, which can mean time for training is limited and sporadic over the day. The loss momentum in training can be a de-motivating factor for the employee. However, a positive notion was the ability to restart training as many times as required. This helped to fit the training with work demands. Also, the granularity of the learning content was a desirable feature. The completion of a unit within a module was viewed as milestones of achievement, a motivating factor for employees.

The availability of training to employees in some companies was an issue of concern particularly for factory floor workers and labourers. The use of ICT equipment for these types of roles was in many cases non-essential. As such access to the training on a daily basis was difficult for the employer to

accommodate. To overcome this barrier extra day time training sessions were organised at local training centres to allow these employees to opportunity for training. The employers in this case organised the release of employees from work duties to go to training centres and do the training. The employer was willing to allow the employee to do this even though it meant the losing a worker for a period of time. However, the re-organisation of work duties for a period of time worked well for the employers. Initial thoughts when this situation arose, was the employers would prevent employees from the training. However, this was not the case, employers genuinely wanted to train all applicable employees as they saw the benefit this would bring to business in the long run.

7.6.2 Learning

There were two sets of assessments part of the training. The assessments provide an indicator of knowledge acquisition and whether learning had taken place. The pre-assessment, was a test at the beginning of each module, set to establish a level of the student's current understanding. This indicator helped to highlight area(s) where extra time and attention might be required to ensure that individuals fully understand the concepts. The second assessment was at the end of each module. The end of module test provides an explicit indicator of skills acquisition and an answer to the question of whether learning has occurred. Table 10 shows progression rates of students at the end of the training programme.

Table 10: Student Progression Rates Post Training Completion

	Completed 1 or more modules	Course Completion – 7 modules	Dropped out	TOTAL
Tower Court	233	23	12	308
Minerva Mill	69	37	10	130
Business Resource Centre	15	1	3	42
Ruralnet	19	15	2	42
Clothing Centre	12	19	8	40
TOTAL	348	109	35	562

The drop out rate remained relatively low. 19% of all students who started the ECDL training successfully completed all seven modules. 62% of all students completed at least one or more modules, but not all modules. As mentioned earlier the onus of Cawskills was not on ECDL completion but on those training requirements necessary for bridging the skills gap. The completion of one module would be an indicator that the student has successfully completed the assessment and hence acquired the necessary skill. To answer the question did the participants achieve Level 2 – Learning (of the Kirkpatrick model), in other words achieve the learning objectives of the training programme? then the answer would be yes, 81% did.

The high retention rate is an indicator of the success of this project. Though this does not suggest the training improves the business, it does go some way to suggest that SMEs have considered that training to be valuable for there needs.

7.6.3 Behaviour

To understand employees view of the training the research focused on whether the employees are using their training within their workplace and job. The literature review suggested that many employees who embarked upon training did know how to transfer the skills to their workplace activities. This part of the evaluation seeks to answer the question are the newly acquired skills, knowledge, or attitude being used in the everyday environment of the learner? The research found ICT training provided to employees was incorporated into the business in different ways. For example, an employee had developed templates for letter correspondence with customers and suppliers to improve the level of professionalism of the company and to simplify the communications process. Another employee developed a database to record customer contact information. When employers were asked whether there was a markedly improvement to the business as a result of the Cawskills, all responded, 'Yes'. When they were asked what difference this was, all answered by providing an example of efficiency improvements in work practices such as those above. Therefore, our measurement of results is efficiency improvements.

One of the difficulties experienced in providing training related to factory floor workers and labourers. The availability of ICT within the workplace was limited as the technology was considered as non-essential to work tasks. Nonetheless, the problem was overcome through the use of training centres. Since having completed the training the research suggests that the role of some of these individuals in the organisation had somewhat changed. The knowledge gained, understanding how to use certain software applications resulted in employees taking on new responsibilities. For example, one such individual in the past was responsible for handling the machinery that compiles rubber sheets for car engine insulation. This individual successfully completed Modules 1, 2, 3, 4 and 5 of EDCL. Through discussion with the employer, this individual took on a part time role of Supply Manager. This role involves the ordering of materials for the rubber sheets. The role requires an understanding of databases and inventory control. Currently, all information about the stock is held on an Access Database. Prior to the training the employee did not have knowledge of how to use databases, spreadsheets or word. The acquisition of skills to use these applications resulted in taking on new responsibilities within the workplace. The benefit for the employers was having an employee who not only has skills as used on the factory floor but and in this case Inventory Management skills. This is but one example of a change of roles and responsibility, but as research found there were many such examples.

The close collaboration between employees and employers during training helped evaluate student progress. The use of the LMS allowed individuals taking training to see their progress in training. Similarly, employers were provided progression reports from training centres about their employees. Any arising issues such as engagement were dealt with very early on the training. Understanding what training employees are taking and knowing what stage individuals are at helped employers when discussing with employee's changes that potentially could happen within the workplace relating to work tasks. As in the situation mentioned above, the employer understood what training was taking place, what modules were being taken and the progress of the student. Having realised this the employer approached the employee once the third module was completed with an

offer that if the individual completed up to module five then they could take on extra responsibility, Supply Manager. This success story mirrors some of the motivating successes of the Cawskills project.

7.6.4 Results

The measurement of improvement of SMEs, to ascertain the success of training, is not a simple task. The funded project meant there was a limit on SME investment. Therefore using Return On Investment (ROI) does not provide a clear indicator of success. The subjective viewpoint of SMEs has been used to determine the value of the Cawskills project.

A second post needs analysis conducted with SMEs, revealed that in some instances (9 of 25 SMEs) more training was required and some reported no evident skills gap (16 of 25). The bridge provided by the Cawskills project helped to address many training requirements of SMEs. Though this does not provide a one off complete solution, it has contributed to helping 64 % of the companies surveyed with their training needs.

Following the completion of Cawskills five SMEs went onto become Investors In People. The reason for this was the infrastructure established in the business, as required for accreditation, was in place. The SMEs stated that it was no longer the case that they could continue to successfully operate without training employees. Ensuring employees have a sound skills based benefits the business, not just today but also for the future, where the nature of the environment is perhaps different from today. Fifteen SMEs report an improvement, or anticipated improvement in basic computer skills. One company said that the computer was now used for “various jobs which up till now were done by hand on paper” and that this was saving office space. One company reported improved staff motivation and team building.

Many SMEs reported an increase in multi-skilling within the business. This was particularly so, where there was a high level of manual workers. In the past in such businesses, the employer would seek to advertise positions to fulfil a skills

requirement. Now these employers look internally to a skills base that at the moment satisfies business needs. One of the aims of this project was to provide ICT training and support to SMEs. There is no value to be gained by providing stand alone training that does not enhance the professional development of employees and the value to employers' business. As previously discussed, business productivity has to date been hindered by competition and globalisation. A training programme that delivers specific training needs when required and allows for the continuation of work demands has been deemed as present within this project, by SMEs.

Using the feedback from employers and employees suggests that training programme, was a success. SMEs have been delivered a suite of IT specific training. The mechanism of delivery was welcomed and the support provided, of value and benefit to the employer, business and employee alike.

7.7 Reflections

It would be foolish to suggest that the Preliminary Design does not require any change. The empirical research has helped to uncover two main issues. Through evaluation and reflection, the flaws have been identified and ways to rectify them. The research has also help to confirm aspects of the design that are fit for purpose and do not necessarily require change.

One of the main aspects of the design change is clarifying which aspects of the solution are suggestive for implementation and areas that must be executed. Related to this problem is the use of the term 'model', it does not align itself well the above design change. It does not make explicit the suggestive aspects of the design. The term 'model' somewhat suggests completing the activities in their entirety, which is not the case. For example, for SMEs with established and up-to-date Training Plans, it would not be recommended that new Training Plans be developed. However, if there are no or out dated plans then this activity should take place. The Preliminary model does not make the distinction between necessary and suggestive activities. Redesigning the model to address the above

would allow users to tailor to the design to their requirements, thus a robust and relevant design.

The second problem with the Preliminary design is does not help to steer a course of tasks. As with many systems design approaches, there are clear steps and focal points in the design which carry the user from one step to the next. The preliminary design does not provide this. The model does not channel the user to a particular stage or provide a critical path of activities. The design needs to make explicit a chronology of activities, clarifying where to begin and where the design ends. In addition, iteration of activities and refinement outputs need to also be made more explicit in the design.

The next chapter provides in-depth information regarding the framework post fieldwork. It gives a step-by-step account in how to use the framework and examples in its application. The new design incorporates reflections as described in the previous section, which came about from the evaluations and reflections during the course of the empirical research.

7.8 Conclusion

In this chapter, the research drew together findings from literature review in the development and implementation of the Cawskills project. The empirical research detailed in this chapter drew insight from collaboration with ProEnviro and CW2000. The collaboration allowed for a better understanding of training requirements of SMEs and business needs and how to marry the two for an optimised training programme. Lessons learnt from the collaboration will be used to refine the training development model that will be detailed in the next chapter.

The first collaboration with ProEnviro set about understanding the training needs analysis of SMEs within Manufacturing. The value of TNAs is accepted by SMEs however the over emphasis of its need by local initiatives has resulted in a loss of value. A view confirmed by the second set of TNAs for the Cawskills project. The understanding that is established by TNA cannot be discounted by SMEs a view support post training when five SMEs subsequently became Investors in People

as a result of a change in attitude towards the need for employee training and strategic planning.

Findings from the Cawskills project enhanced our understanding of how SMEs operational demands, infrastructure affects the need and delivery of training. The research determined training provided on a timely basis and supported by SMEs and employees alike can only be of value if an evaluation process encapsulating skills acquired by employees into the business and work practises. Furthermore, the support both technical and learning must be present not only to support the training, however, helping employers motivate their employees by eliminating barriers that stand in the way of training success they themselves may not be able to address.

The generic guidelines listed in chapter six were used to tailor the learning content, but not all changes were welcomed, particularly by the training vendor. Changing the nature and extent of content is a collaborative effort and one, which may result in some of the guidelines incorporated rather than all of them. The extent of incorporation depends on the extent vendors will permit. Though all guidelines incorporated are desirable, realistically this may not be the case. The Cawskills project had an added advantage, Ruralnet. The technical expertise available from the training centre, allowed for the inclusion of Help, Discussion Forum and Email, independently from the training vendor. Utilisation of a provision already available was beneficial to the project and this should be considered as an option if these functions cannot be provided by Training vendors.

CHAPTER 8 A SYSTEMATIC METHOD TO DEVELOP WORK-BASED TRAINING FOR SMES

8.1 Introduction

This chapter details an in-depth instructional guide to using a training model. The 'Post Collaboration Model' is a culmination of theoretical grounding and practical application. Though, the model in its present form, has not been implemented, its design has been informed by the development of a training programme called Cawskills which was detailed in the previous chapter. Cawskills provided valuable insight into online training within the workplace. Findings from chapters three to six provided an overview that shaped the Cawskills project. However, it was post-training evaluation that enabled the Post Collaboration Model to take its present form. Section 7.7 highlighted aspects of the Preliminary Design used in the Cawskills project that necessitated change in design. This chapter presents those reflections to deliver a conclusive model.

WeBTiE (Web Based Training Environment) is presented towards the end of this chapter. This finalised model and generic guidelines are a result of encapsulating changes, as a consequence of Triangulation.

It should be noted that the model illustrated in this chapter is not specific to manufacturing but applicable for SMEs regardless of their industry base. In addition, the final form of the model has not been applied in the development of a training programme.

8.2 Methodology

This chapter will bring together the E-Learning model, E-tivities and Structured On The Job Training (S-OJT) proposed in chapter five, with the instructional design principles from chapter six and lessons learnt from chapter seven, to inform the design of the Post Collaboration Model. The encapsulated design brings forth a systematic method, which when used by SMEs delivers online training within the workplace.

The model (

Figure 20) below has been taken from chapter two. The extract depicts elements that have informed the development of a training programme executed in collaboration with ProEnviro and CW2000.

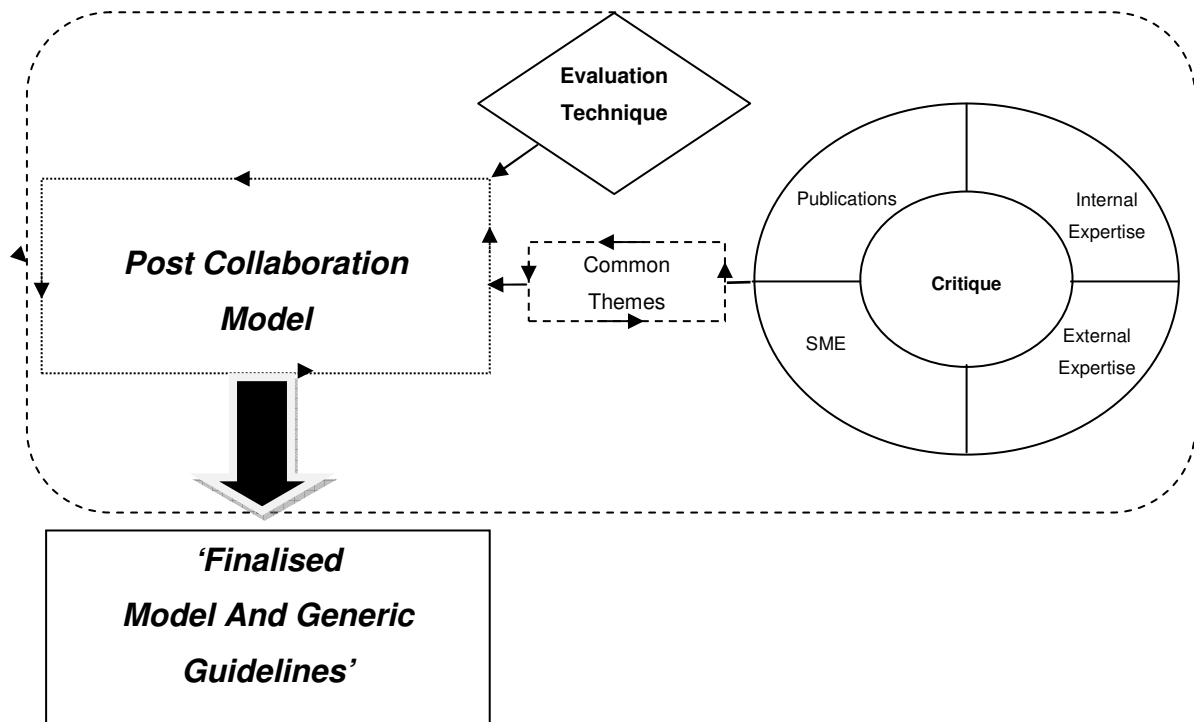


Figure 20: Chapter 8, Research Design

An evaluation of the training programme (Cawskills) was conducted using the Kirkpatrick Evaluation method as determined in the chapter four. The aim was to determine whether the programme achieves its purpose based on four specific perspectives. Details of the results of the evaluation are detailed in the previous chapter and its affect on the training model design.

To address the subjectivity in the design and to ensure reliability, triangulation of the findings is required. As detailed in chapter 2, a multi method and investigator approach is to be used. Once the results have been triangulated the findings of common themes are used to ultimately refine the Post Collaboration Model, resulting in the Finalised Model and Generic Guidelines. Critical Reflections or section 8.6, documents the elements of this chapter, which are considered vital in

shaping the training. It presents the results from the evaluation process that necessitates change of the Post Collaboration Model with justification of those changes.

8.3 Post Collaboration Model

The Post Collaboration Model is a tailored online training solution specific to a SMEs' training needs. The portal within which online training is provided is the collaborative efforts of the Employer, Employee and Training Vendor. The portal encapsulates not only the learning content, but provides the learning support necessary to guide employees through the training and reinforce work-based practises with the use of a Community of Practice. Unlike many other training models the originality of this model is that it combines Pedagogy principles in the development of the training programme, along with e-learning model, E-tivities for Structured On The Job Training. The generic nature of this model allows it to be adaptable for SMEs in a variety of industries and the tailoristic feature provides the flexibility necessary to permit the adaptability.

As described in chapter four, SMEs commitment needs to emanate from the employer to the employee. There is a presence of recognition for the need for training where political (competitiveness agenda) and economical factors stands in SMEs path. Though the drive for training fuels better productivity and operational effectiveness, there is a need for SMEs to fit it into day-to-day work demands. The resources constraints experienced by SMEs may not lend itself to enable them to embed training as functionality of the business but by establishing an infrastructure provides the foundation upon which a culture for training can be build on. Therefore, the training delivered must be flexible and Just In Time and centred on work practices.

The view of S-OJT needs to extend training needs from action and problem solving within the work environment, and centred on live projects and challenges to individuals and SMEs. This makes the training meaningful, relevant and Just In Time. The creation of knowledge should not be an individualistic task but a

collective activity, one in which employers and employees alike exchange ideas, share problems and solutions.

The Post Collaboration Model is a platform where an SME can embark upon timely relevant training whose Just In Time training balances work commitments demands with progressive training requirements that are not only relevant to the organisation at the time, but also builds on previous knowledge and understanding, allowing the SME to construct a new level of understanding. Figure 21 shows a model, which forms the basis of the training development process for an SME. The model highlights the main layers that will make up the model.

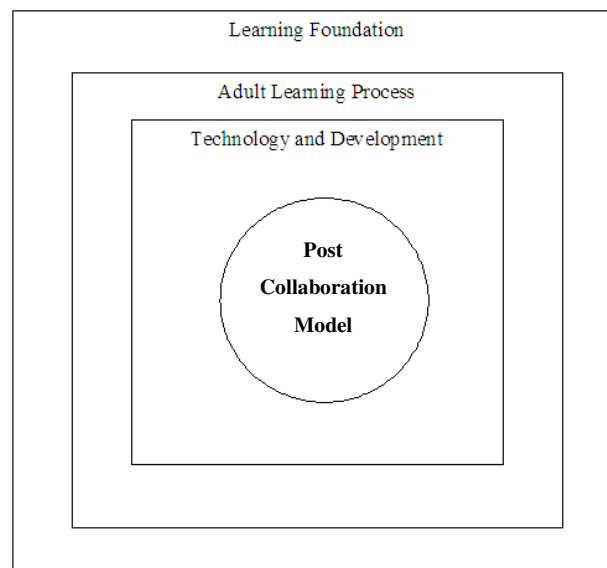


Figure 21: Post Collaboration Model.

The model has three distinct layers, they are: Learning Foundation; Adult Learning Process and Technology and Development. The incorporation of these three layers will bring about the development of model. This is a training portal for SMEs and their employees to undertake training in-house, or at home or at other office branches. The training will be specific to the individual's learning requirements, the organisational learning requirements, and the organisation's strategic direction. The purpose of the training is to bridge the individual learning gap, the organisation's learning gap and to ensure that for the business to move

forward and meet both business and environmental demands it has the key skills in-house with Just In Time training. Also, over time as the needs change the training too changes and adapts to the new rising requirements and challenges.

8.3.1 Learning Foundation

The Learning Foundation relates to the development of an infrastructure within the business. The layer is an understanding of the business, its mission, aim and objectives. It focuses on change management and adapting culture to allow for training. As detailed in chapter four, establishing a culture for training works in favour of the SME in establishing training programmes. Employees who welcome the need for training and Employers who lead training initiative are more likely to benefit personally from the training as well as benefit the business through process improvement. Above all, it is an understanding of the training requirements and its fit with organisational requirements.

As the name suggests the Learning Foundation provides the platform upon which the training programme can be built. It is vital that a robust foundation has been established in order to sustain long term training culture and functionality. There are several components that make up the Learning Foundation and the time taken to establish these components depends on the SME. As described in chapter four, the infrastructure for training consists of Business Strategic plan; Human Resources plan; Budget and Training Plan. These components allow the employer to focus on the needs of the business, its resources and the business learning needs. The infrastructure brings together a formal approach to what training is required in line with the business needs and future direction. Businesses and SMEs alike can be channelled on the learning needs goal. Further information about what these components are and their level of use by businesses in Coventry and Warwickshire can be found in Appendix 1.

SME training and development can be complex and resource intensive. Many because of their focus on the operational demands do not have realisation for the need for training. This lack of attention, combined with, in some cases non-existent infrastructure, does not allow for the employer to be well informed about

their training requirements. Identified training requirements by employers or free training does create a realisation for training or bring about contextualisation of training.

8.3.2 Adult Learning Process

Chapter six explored the principles of Andragogy (theory of how adults learn): Behaviourism; Cognitive Theories; Constructivism. These have been brought together and the instructional design principles to apply to the development of an online training programme have been compiled in chapter six. The purpose of these principles is to optimise the learning process for the trainee. As mentioned in Chapter three and four, SMEs operate at an operational level and so have very limited time for training. By optimising the instructional design the training event can be maximised.

Movements toward a knowledge-based economy will enable businesses to sustain competitive advantage in the light of globalisation. The shift towards a knowledge-based economy has serious implications in the way education is viewed and delivered and the role e-learning has in reducing knowledge gaps. Shortening product cycles, increasing competition and globalisation, technological advancement and reliance have led movements towards a knowledge-based economy. However, this has given rise to a lack of skilled personnel. The accessibility of courses via intranets and the Internet requires self-paced training and is 'anytime anyplace' availability that reduces the cost of training and gives rise to strategic advantage for SMEs. Situated learning is intended to allow the learner to execute tasks and solve problems in an environment, which reveals the various intended uses of the knowledge. However, to achieve competitive advantage and to keep pace with operational demands it is important that the learning content is tailored in order to optimise training advantage.

With the array of learning theories, it is difficult to determine, which theory is used in the training. The popularity of constructivism and its use in adult learning has gained much interest and clearly has a place in instructional design of online learning, as the research established in chapter six. Adult learning should

incorporate online instructional design principles and an understanding of how adults learn: the pedagogy and andragogy. More importantly, with consideration of adult learners, thought needs to be given to an added dimension, one, which differentiates these learners from other learners, that is they have valid prior knowledge and experience. In addition, though an individual may have a number of training requirements not all requirements need to be fulfilled through work-based training. The priority of training needs to link to the requirements of the organisation and fit into the direction the SME is going.

8.3.3 Technology and Development

Technology and Development are considered to be an essential part of the overall development process. The technological infrastructure enables the development of the portal synonymously. The portal relies on Information and Communications technology, the deployment of training is based on Internet accessibility and as such, it is important to have the presence of the hardware and connectivity. As highlighted in chapter five, the use of PC technology and the connectivity is not readily available to all employees. One of the key activities, as part of Technology and Development, is to ensure the technology used to disseminate the training programme, is available to those who need to train. The difficulty is that additional cost factors can be a hindrance. However, what needs to be remembered is the Return On Investment (ROI) once the training has taken place.

In order to deliver training, it is vital SMEs have appropriate IT infrastructure in place, before any training is embarked upon. SMEs, therefore fall within three positions in terms of their technological level Firstly, SMEs with no IT infrastructure in place; Secondly, there is limited capability or thirdly, there is sufficient capability. The time required to provide sufficient capability depends on the SMEs current infrastructure. It is important to remember that learning content will use multimedia file formats, these file types require sufficient bandwidth that can be provided by Broadband technology to reduce download times. SMEs need to acquire network and PC technology to take advantage of Internet and Intranet. As with systems development approaches, the implementation of a new system, as in this case, also requires a methodological outlook. To successfully introduce

new technology in the workplace, management needs to be carefully considered and applied.

The other aspect of this layer is Development. This places focus on the internal readiness of the SME. As already considered, SMEs have limited time for training. How can the SME provide time for employees to take training, needs to be thought through. The solution for this issue will differ for each and every organisation as the operations inevitability is different. The change management process, whereby changing employees' attitudes to training requires careful consideration along with embedding training as functionality of business rather than a desirable activity.

8.4 How To Use The Model?

The Post Collaboration Model is an incremental process that relies on strong collaboration between all Stakeholders. The development of the guidelines have been informed by the many issues affecting SMEs such as Learning theories; Structured On The Job training model; E-Tivities and principles of Software Engineering. There are essentially six key stages to the development of the generic guidelines for the development of an online training programme for an SME. These stages can be seen on the figure below.

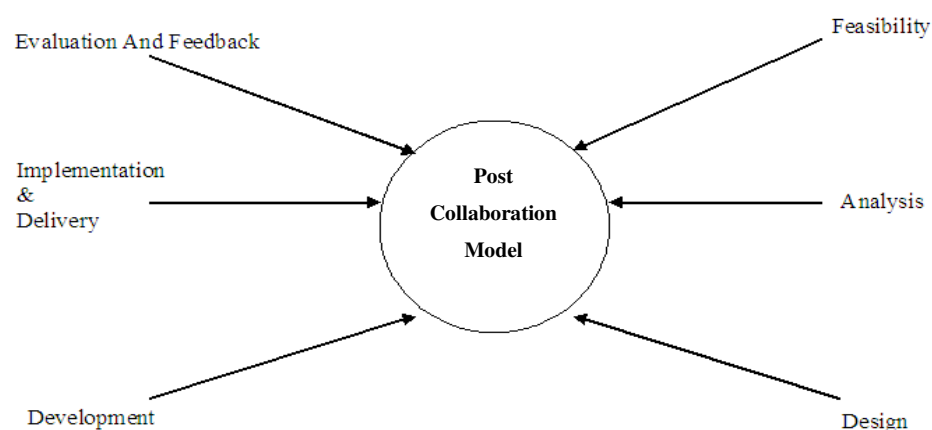


Figure 22: Model Design Components

The model above (Figure 22) shows the main phases to the training design. Each phase is vital to the development of the training programme. To illustrate how each phase above relates to Figure 21, Table 11 maps the stages of the above model against the three main components defined in Section 8.1.

Table 11: Mapping Of Model Phases

Phases	Components
Feasibility	Learning Foundation Technology & Development
Analysis	Learning Foundation
Design	Adult Learning Process
Development	Adult Learning Process Technology & Development
Implementation	Technology & Development Also, it is part of the core of the model
Evaluation & Feedback	This stage can bring about iteration of the entire developmental process.

As can be seen from the table above, each phase may inform the development of one or more components. For example, Feasibility is part of the Learning Foundation design as well as informing the Technology and Development component.

The following sections provide further detail related to the activities of each Phase and how they each provide the basis for the next phase.

8.4.1 Feasibility

Prior to the development of the training programme, as in systems development approaches such as Software Development Lifecycle (SDLC) or Rational Unified Process (RUP), consideration is given to establishing project viability. The results of which are used to make a decision, whether or not to proceed with the project. It is important that the SME embarking upon training is aware and prepared for

impending change. There are a number of questions SMEs need to address to ensure project viability. They are:

1	Do I have the time and financial investment for training?	Investment and Time to enable employees to take training.
2	Are my employees willing to undertake training?	Change Management and Culture
3	Would I (the employer) like my employees to undertake training?	Employer led training
4	Do I have the IT infrastructure to enable the training?	IT Infrastructure

It is important to have answered yes to each of the questions. Each question addresses how prepared the employer and employees are and whether the infrastructure is present to enable training. If not, are the SME prepared to establish it?

SMEs are faced with many problems in the uptake of training. They recognise the need for training, but this recognition is not supported by current working practices, culture, financial constraints and provision. SMEs do not have the time nor investment to generate bespoke training programmes as you would find in larger organisations where the infrastructure and culture permits such activity. As such SMEs look to initiatives within the local area which may cater for their needs. However, this does not always provide a ready solution. The delivery mechanism and content does not always fit in with working practices, employee and business learning needs. SMEs require a delivery mechanism which will not only be adaptive but be responsive to their needs.

Once it has been established that the SME is prepared to invest in online learning and for operational change along with the employee, can proceeding to the next stage.

8.4.2 Technology

It is important for SMEs to have the technology in-house, in order to allow training to take place. ICT provision needs to be in place so that online S-OJT can take place. ICT equipment does not have to be a high cost investment, in fact the government has tax relief for such purposes and there are many public initiatives, whereby equipment is available for training purposes at a subsidised cost (CW2000). Similarly, fast Internet connection needs to be in place. BT recently in conjunction with CW2000 put in an ADSL connectivity infrastructure into Coventry and Warwickshire for many manufacturing businesses to exploit Broadband for their business. It is important to have the appropriate IT facilities available for individuals to take the training. In parallel to this needs to be appropriate bandwidth. The training programme itself will have a specific size and to use the programme the SME will need to ensure that there is appropriate bandwidth available for the access and download of the programme.

Though many SMEs already have some technology relevant to the training in place, consideration should also be given, to accessibility. Those employees where ICT use is non-essential in work tasks need to be accommodated. As determined in chapter seven, SMEs made provisions to release employees from work duties for a set period of time to use facilities at local training centres and take training. The use of such provisions can benefit those SMEs where accessibility is a problem.

8.4.3 Analysis

Figure 23 illustrates the Learning Foundation that needs to be laid before an SME can invest in learning. The importance at this stage is to ensure that SMEs are prepared to undertake training. As Mazzarol (2004) states, SMEs need the infrastructure to be in place in order for training to embed itself in the business strategic direction and for the training therefore to be relevant to working practices.

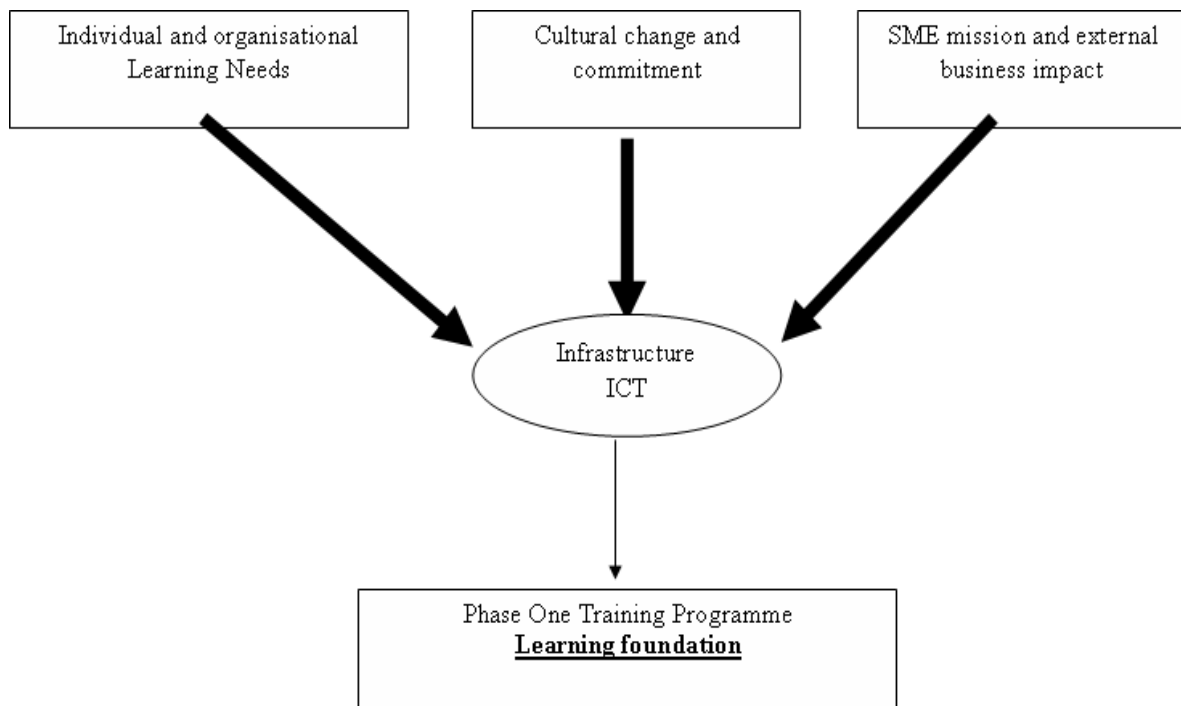


Figure 23: Phase One Training Development Model

Figure 23: Phase One Training Development Model shows the levels required to establish a platform the Learning Foundation, upon which training programmes will be developed. The Learning Foundation, which is the goal of Phase one is the establishment of the SMEs commitment to training and up-skilling. It is a process, which seeks to implement and change the organisational culture, to bring about a Learning Organisation. This stage requires commitment not only from the employer but employees alike, who without which, the success of the programme will not work. There are four key considerations to this model, they are:

- individual and organisational learning needs;
- culture change and commitment;
- SME mission and external business impact;
- infrastructure and ICT.

The principle aim of this model is by addressing the above components you are building an infrastructure or environment within which training can take place. By

addressing the learning needs, changing culture in readiness for training and determining the strategy of the business, you are modelling the infrastructure.

8.4.3.1 Individual And Organisational Learning Needs

As mentioned in chapter four all training the employee undertakes needs to link with the SMEs' aim and objectives. A two fold Training Needs Analysis process will help to determine the training requirements of the organisation and individual employees in relation to the job requirements and business requirements. The assessment would form part of the development of the Human Resource Plan. The analysis of this will identify one of two things, firstly, individual training requirements and secondly commonality in training requirements throughout the business. These requirements will then need to be prioritised.

A Training Needs Analysis (TNA) process would shed light on whether or not a skills gap exists. As detailed in chapter seven, the use of TNAs allows for the assessment of individuals skills within the job context. Attention is given to the tools used within the job and the extent of its use by the employee. SMEs need to ensure that technological understanding of employees is proficient enough to allow them to use the technology used by the training programme. This is not a one-off exercise, but one conducted on a timely basis and informed by previous training evaluation processes. However, it is important to note that the training requirements identified need to be linked to the SMEs strategic direction.

Alignment between the learners' learning requirements and the organisations' requirements need to be supported by learning objectives and assessment. The blend of learning and performance allows the learner to shape the organisation's alignment. It has been determined, that technological development must support the blend of learn-perform-innovate, which in turn can support alignment activities. The evidence supports the need for aligning training with organisational activities and how training activities informs both the strategic direction of the organisation and vice versa. The alignment between training needs and the organisation also provides relevance of training to the employee.

There are many initiatives available to the SME that assesses the training and learning needs of employees, freely. The use of tools available from the likes of Business Link, can provide just as robust assessment of individual's training need as would the assessment from a Training consultant. The activity of determining the training need in this manner also considers previous knowledge and training, which is vital if knowledge is constructed rather than simply disseminate information.

The execution of Individual Training Needs (ITNA) can be carried out at the same time as Organisational Training Needs (OTNA). The focus of OTNA is to determine what the strategic direction of the business is and what learning and training requirements are relevant to carry the organisation towards that direction. Information for the OTNA will come primarily from the Owner or Manager of the business. SMEs who have Investors In People accreditation have already established an infrastructure for strategy and skills requirements. TNAs are carried out as part of the accreditation and repeated on a timely basis. This process can be utilised so as to prevent duplication of activities.

Once both sets of TNAs have been complete, they need to be analysed with a view of determining specific training requirements for the individual which aligns with the strategic direction of the business. To help with prioritisation a useful technique to use is 'Must Have, Should Have, Could Have Won't Have' (MOSCoW Rules) (Howard 1997; Ash 2007).

Must have - fundamental to the business success.

Should have - important but the business success does not rely on these.

Could have – can easily be left out without impacting on the business.

Won't have – this time round, can be left out and done at a later date.

Its' development is attributed to Dynamic Systems Development Methodology (DSDM), a management and control framework for rapid application development.

The most important training requirements, the 'Must Have' would be the requirements for which training must be sought immediately as these are

fundamental to business success. This process should be informed by previous training evaluation activities. However, it is important to note that the training requirements identified need to be linked to the SME's organisational objectives. Figure 24 illustrates how to determine training for the learner with an appreciation of affecting factors.

To determine which training requirements to provide employees, a number of factors should be considered, as not all training requirements need to be addressed.

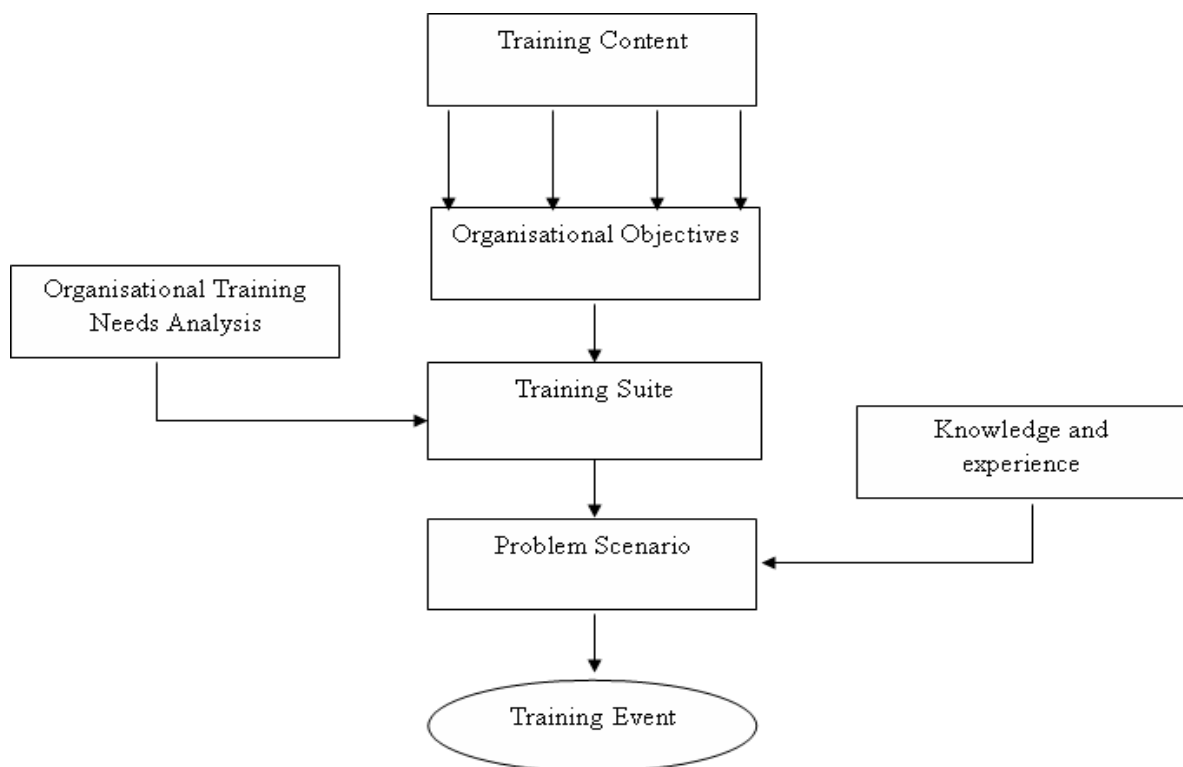


Figure 24: Training Prioritisation For SMEs

As the model above shows an appreciation for available training would help decide where to seek training vendors. The completion of TNAs and its alignment with organisational objectives will bring about a list of potential training requirements. This then needs to be correlated with the knowledge and experience of employees and current problems being experienced by the SME. The training requirement(s), which satisfies both the Problem Scenario and builds

upon the knowledge and experience of employees should be seen as the 'Must Have' training requirement(s).

The prioritised list of training requirements have associated cost implications for the SME. The financial cost to deliver the training needs to be addressed by the SME needs to be pre-determined. SME needs to decide how much of the training they are willing to pay for, this would not only include the cost of training but the time for training. The development of the Training Budget from the onset provides an outlook for what training can be achieved. SMEs would ring-fence money as defined in the Training Plan, to ensure it is spent on skills development and not other business activities. As deduced in chapter three and four a common reason regularly cited by SMEs for why they do not provide training is a lack of funding. The Training Budget will enable the development of the Training Plan. The plan outlines who will undertake training, what training is required and justification.

The Training Plan sets out the training goals for a specific group of employees. It is important to put this plan in writing and distributed to employees so that everyone knows what the training objectives for the next year or during a term defined by the SME. Putting a plan in writing formalises thought for the training needs of the business and sets priorities of the training programme.

8.4.3.2 Cultural Change And Commitment

An environment for learning and training needs to be created. Culture for training in SMEs does not easily lend itself for training. The premise of 'why there is a need for training' can be ripe and difficult to break. A commitment for training needs to be in place from employers and employees alike, which states they will undertake training. The operational demands SMEs face can make the opportunity for training very difficult. Levels of multitasking in organisations will vary, therefore for an individual to take time away for training may be all that more difficult. However, as found from empirical research flexibility in the workplace and commitment from employers (Employer Led) encouraged employees to train. Employers need to allow employees time from work to train, at work and

employees must want to train. Without the commitment from both sides, can only then, the motivation for training be present.

As already mentioned training in itself demands change in working practice. Learning is an integral part of change management. The benefits of training would include amongst others, increased productivity and efficiency. SMEs and employees need to be prepared for changes within the workplace. Roles and responsibilities will undoubtedly change, evolving to meet new demands of business. Through training, better or alternative working practices become evident to the employer and employee. Both need to be prepared to trial new processes, be receptive rather than reactive against new ideas. As with the development of a new system, user involvement ameliorates change management (Pressman 1997; Mullins 1999). Similarly by involving employees in the developmental process you are giving ownership of the system to the user.

8.4.3.3 SME Mission And External Business Impact

Any training which the SME embarks upon needs to achieve the business mission in order for it to be relevant. SMEs need to formalise the direction they wish to take their business in, if they have not done so already. The understanding of the long-term goal of the SME enables them to identify the skills for the future. It is also important the employees understand this direction as when training is conducted process changes ideas for the future will come from these individuals.

Levels of understanding in strategy building, mission, aims and objectives will inevitably vary, the smaller the business the less focus on long-term goals. Once again, there is much support available to SMEs from government' established programmes such as Business Link and Advantage West Midlands that provide a mechanism to allow SMEs to structure and formalise their long-term perspectives. The strategic direction will help to channel training to achieve the goal of the business.

8.4.3.4 Infrastructure And Phase One Model Development

Consideration of the infrastructure is vital to the success of the training programme. Prior to embarking upon any training the employer must ensure they have developed the following:

- Business Strategic Plan (BSP);
- Human Resource Plan (HRP);
- Training Budget;
- Training Plan.

Activities in the sections above help to inform the development of these documents. These documents provide a transparent assurance for training and the mechanism, in which to achieve success. The development of the above means the SMEs will have the support mechanism in place prior to training commencement. The BSP and Training Plan are tied together in the future direction of the business. SMEs need to decide which direction the business will move. Factors such as competitors, business competencies, aim, mission and objectives all need to be considered and any training SMEs undertake are tied into their overall business goal. The HRP ensures that attention has been given to the roles and responsibilities of employees. SMEs need to map employee's jobs against the BSP and deliver roles and responsibilities across functions. This matrix allows employers to map skills requirements of individuals so that gaps in skills can be identified and training sought.

The prescriptive nature of the four sets of documentation mentioned above will depend on the SMEs. These documents are also seen as a base line for documentation that is required for Investors In People and though it is not been suggested that SMEs should follow the procedural route of documentation in IIP to develop their own Infrastructure, it is important to note that sufficient depth would be required.

8.4.4 Design

In the previous section, a Learning Foundation was established. At this stage SMEs have an understanding of the learning requirements, budget to deliver the training and adopted a culture for training to embed training as a key functionality. As stated in the chapter four, S-OJT provides the platform for delivering training to SMEs. It is widely accepted that SMEs cannot develop training programs, therefore there is a need for a designed programme, specific to their needs, a customisation of learning content would provide a solution. The challenge now is to bring the elements: E-tivities, S-OJT, Collaborative working; Just in Time Learning templates together, within a training portal.

The learning portal would provide a single access that serves as a gateway to learning from multiple sources by aggregating, hosting, and distributing content. Principally, you can pick and choose courses from a multitude of vendors and create customised programs rapidly for in-house training. There are a number of considerations to be made when selecting the training vendor. Firstly, they need to be prepared to make alterations to the interface of the content; secondly the structure of the learning content must be in a modularised format. However, before learning content can be customised or the portal developed, a training vendor would be required.

The process of designing the training will involve external help. Once the training has been identified and the infrastructure is in place can the SME seek the training vendor. As previously mentioned there are numerous online training programmes already available but none, which can cater for the individual SME. This research places importance on the delivery process as much as the learning content. Therefore, finding the appropriate learning content will not be the difficult part for the SME but finding a vendor willing to allow for customisation to the extend the SME requires. Once the potential training vendor has been found the SME will need to work closely to bespoke the training to their requirements. Bespoking is not simply a process of tailoring the interface, but moreover tailoring the delivery process as well. In chapter six three sets of instructional design principles were developed that have been taken from the plethora of learning theories present.

The lists enable the SME to optimise not only the learning content but also the training experience and its fit with working practises.

The collaboration between the SME and the Training vendor would allow for the development of a training portal that not only delivers online training but supports the learning process, helping the employee to inform work-based practises. Figure 25: Portal Components sets out the components that are considered necessary to support the learner and the learning content. As detailed in chapter five, two levels of support: Technical and Learning, need to be provided. Technical support would be provided by the training vendor and to an extent the SME. The Learning support is a collaborative effort from the SME, E-Moderator (Instructor/Manager Support) and other learners through the Discussion Forum, CoP and Email.

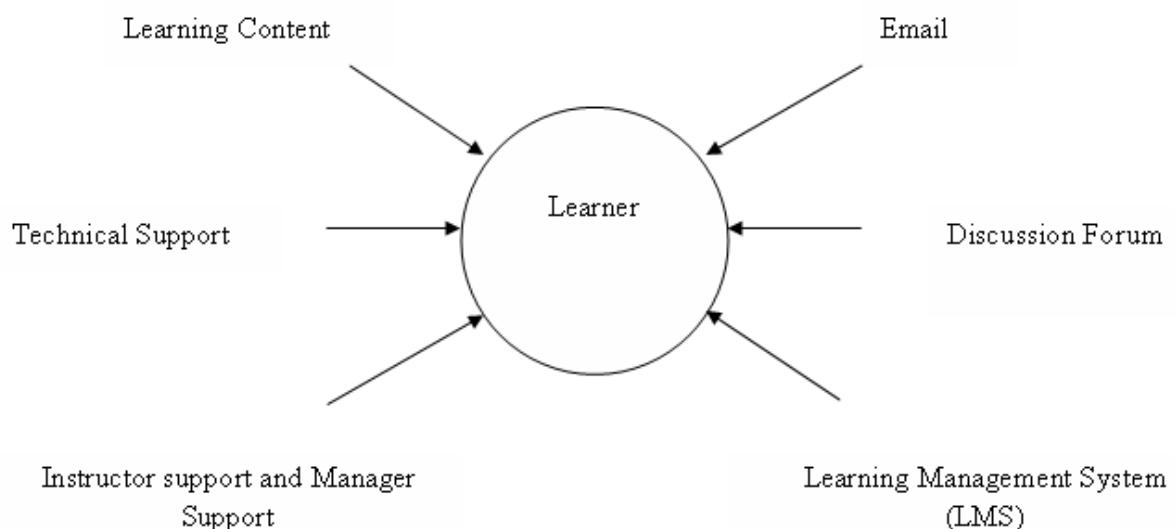


Figure 25: Portal Components

Portals as a training solution are well suited for SMEs that do not have the resources or time for a customised course development, learning management software, or a large implementation. The presence of Application service provider (ASP) would allow for quick and easy access and set up that overlooks the barriers set by firewalls. The benefit for the SME is that they have lower costs than bespoke e-learning solutions as there is no or little content development, network administration and maintenance.

8.4.4.1 Application Of Instructional Design

When a suitable training vendor has been identified to collaborate with and the training content to be used, the content needs to be tailored using the Instructional Design guidelines. In chapter six, what must be present when designing a Learning environment, was detailed. The three sets of guidelines are not designed to be an exhaustive list that must be applied in the development process but rather serves as a generic guide that are considered as desirable features that aim to enhance and optimise the training experience. To ensure that these design instructions are used, the SME will need to have strong collaboration with the training vendor to enable, particularly, modularisation, menu structure and elimination of redundant information. The current approach in training for training vendors is delivering off the shelf training with little or no thought to customisation. Emphasis is placed on the customisation process and this can only be achieved if a training vendor is willing to corroborate.

In order to allow for Just In Time learning to take place, it is important that content is broken down into manageable chunks. Each unit of training needs to have specific objectives highlighted at the beginning of each unit. The purpose of breaking down the content in this manner is to permit individuals with vary training needs to commence training at a specific point applicable for them. Also, as and when the need should arise, employees should be able to access content at specific points to enhance their understanding on particular issues and recommence work duties once complete. For example, if an administrator is attempting to send an email but needs to use the mail merge feature, but is unsure as how to use this, then they should access the training search for the unit about mail merge go work through the unit and apply understanding to work practice. This form of training and learning allows for immediate application of knowledge to business with minimal time away from work duties.

8.4.4.2 Instructional Support

As previously discussed, a learning support system must be in place in the form of emails, discussion forum or face-to-face support with the trainer. As mentioned in chapter five, learners need to know that they are not the only ones training. Just as in the classroom environment, trainees seek support from one another to resolve problems, the same opportunity needs to be present online.

As described in chapter seven many of the SMEs who undertook training had used the Internet to a great extent and some none whatsoever. There was a general phobia to this form of training and the technology. To help overcome this, blended learning approach was used. Such a method should be applied where the SME has employees with either limited experience of using the Internet or training online. Phased classes should be scheduled for the trainees whereby they able to meet with the trainer and other trainees. During this time the trainees are able to ask direct questions to problems they maybe experiencing and receive immediate answers.

To help trainees in feeling that they are part a community of learners, with similar needs as their own, it is important to have as a minimum of one face-to-face meeting with both the trainer and other trainees. For SMEs where there are only one or two trainees this meeting can be informal. However, where there are many trainees then this process needs more structuring. It should be conducted at the SMEs' location as this is where the training is more likely to take place. For further information about blended learning see chapter five and six. The initial meeting should be a starting point for the training. This is when logins and passwords are initialised and trainees are first faced with the training environment. It is important as was found in the fieldwork that the first time people use the training portal many problems erupt. These problems can be technological or simply incorrect entry of details. Therefore, to alleviate these problems and to give assurance and support for the learner, it is important to have the first face-to-face meeting.

8.4.4.3 Technical Support

No one can make the claim that technology is 100% reliable. On this basis the training vendor should provide technical support if something goes wrong. The technical support would be a surety to the employer who may not be technically proficient themselves that help will be at hand. Ensuring there is technical support would be invaluable to the SME for many reasons. Firstly, a lack of technical understanding can be a de-motivating factor for not only the SME but also the trainee. For example, the 'plug in' requirements used in multimedia files can prevent the opening of the training module. The solution is simply to download the 'plug in' files to either the desktop or to the Intranet. Without the technical know how, it would be difficult to at first instance, ascertain the reason for the problem and what the solution would be to resolve the problem.

8.4.4.4 Learning Event plan

An extension of the Training Plan would be the development of a Learning Event Plan. The purpose of the Learning Event Plan is to establish individuals training events, progress and when to take time to train. This helps both the employer focus on releasing an employee from operational responsibilities for training and for the employee to understand that the employer is committed to training. The formalisation of this process provides an understanding on both sides of everyone's responsibilities. The Learning Event plan can be as formal as the SME needs it to be. Clearly, there are benefits to be reaped if the document is formalised as it will clearly set out who is doing training, when and their progress. It will also help to map timescales against modules. The employer as well as the employee can clearly see what the progress status is.

8.4.5 Development

The execution of the previous stages allows the SME to develop the training environment. As the trainer vendor develops this, they need to collaborate with the SME. The stakeholders in the programme development should test the portal

for both usability and accessibility. The elimination particularly of redundant information is important. Also, a number of different applications i.e. Email, Discussion Forum and Learning Content need to be brought together as a seamless integration. The integration of these components needs to appear to be as part of the same programme, with consistency flowing through the entire programme.

8.4.6 Implementation And Delivery

As with any software development and implementation, this process requires delicate handling. The implementation technique should be agreed by both the training vendor and the SME. However, whichever method is used to implement the programme appropriate technical support must be to hand to eliminate both bugs and to address finalised tailoring requirements. The training portal will have a number of elements that will allow the delivery of training, provide opportunity for collaboration and has appropriate support for both the learner and the SME.

Figure 25 illustrates the components of the portal, which brings these elements together. It is also important to note that this is a hybrid model. Not all of the learning content will be delivered online. As stated in section 5.5.1 there is a need for face-to-face interaction as the Xers have would have the opportunity to become familiarised with the virtual learning environment. Furthermore, the first level of E-tivities, where there is an induction session for learners, should be conducted face to face. This would be an opportunity to meet the E-moderator, the supervisor who will support them at work and other online learners. It has been stressed the importance of relationship development and how this is easier through regular face-to-face interaction, where participation is easier. During this time, they should have the opportunity to use the system, login explore the discussion forum, send an email perhaps and get started with the training. This session is an opportunity to address the concerns the learner has about the new environment, as well as to eliminate some of the start up issues such as login problems. The research found other strategic face-to-face sessions be arranged so that learners can continually be encouraged and motivated. These sessions should be optional for the learner who, if they need additional support in a

traditional setting has the opportunity to do so. The number of additional sessions will depend upon the needs of the learner. Essentially, if the internal support (Line managers/supervisor) and encouragement is present then this would not be a frequent task.

There are many key in-house skills that exist with SMEs, that should be taken advantage of. Focusing on these potential skills, a role which emerges is 'Who runs the training sessions?'. Clearly, those SMEs who have skilled practitioners in-house would naturally be used as a resource. It would be envisaged, that in such circumstances face-to-face sessions would be run in-house. The advantage of this is that little time would be spent away from work. Also, there is a readiness of support internally in the organisation and that support is familiar to the learner(s). On the other hand if the expertise is not available in-house then the E-moderator would assume the role and this can be done ideally in-house or alternatively off-site. The implication being that cover for the employee who is away from work would need to be arranged.

As mentioned earlier the training portal requires the presence of Email and Discussion forum. The role of these applications is one that provides learning support to the learner. The email should be used not only for communication but for collaboration with others on the training programme but as an avenue where information is exchanged about the training content, its use, application to work practises and problem solving. The discussion forum can also provide learning support in the areas mentioned above but this can be more generic. The forum does however enable the opportunity for the development of a CoP. The CoP places strong emphasis on the need for collaborating online and to emulate a social network that supports a community of practice. Informally, there exists sharing of knowledge between employees, even though it may appear the technology drives the information flow, it is the social world or network that binds people together and the knowledge sharing that can take place provides the relevance to the workplace.

8.4.7 Evaluation And Feedback

To ensure that relevant training is identified you need to be able to understand which direction you are going in. In addition to the above, an additional requirement is proposed as part of the infrastructure and that is Evaluation Process. SMEs need to be able to understand from the onset the importance evaluation has to ensure that the skills and knowledge acquired by the employee is applied in working practices. The process whereby this is done needs to be adaptive and responsive to the business' needs. For this reason the evaluation process is phased during the course of the training event.

It important that job related tasks are continued during training. It is difficult for the employer to allow employees to have long periods of time away from work tasks training. Training which is conducted in a JIT method allows for both work and training to be conducted in parallel. Evaluation needs to be phased when new modules are completed. An assessment of what is learnt and how it can be applied will enable the employer to ensure the skills are being transferred. The evaluation process need not be a formal method of assessment. This process can be employer instigated who will undoubtedly identify areas of improvement in their working practices and bring this to the attention of the employer will aid on the way to job enrichment. At the end of the training programme a review process need to take place between the employer and employee. The review process reminiscent of a Development and Performance Review considers the value the training by looking at the Reaction, Learning, Behaviour and Results. The use of Kirkpatrick model (detailed in chapter four) for evaluation provides insight into the value of the training. The reflective practise at the core of this model would also allow for a review of work-based practise change and improvement. The model looks at four key areas stated above, these aspects need to be considered post training. The considerations will allow you to think about whether the training has improved work-based practices and whether any other further training is required.

The end of the training does not mark the end of the training process. The evaluation is a very important stage of the training. Both the employer and employee who have seen the completion of training need to discuss the progress

of the training, whether further training is required and most importantly how the training has informed their job. All training needs to be able to improve working practises, to take the benefits of the training into the business you must look to changing processes. The employee will have been able through the training made clear links to their job and through this be able to see which areas could be changed for the better. The discursive activities that take place between the employer and employee reflect upon the need for changing work practises and other desired changes all of which are intended to achieve the strategic aim of the business. This process can be repeated to see whether the change has been effective and beneficial or not.

8.5 Summary

To summarise the first layer, Learning Foundation aims to prepare the SME in readiness for training along with the Technology and Development layer. It looks to address issues such as culture, organisational change and strategy development. The second component, Adult Learning Process, looks to encapsulating E-tivities, S-OJT, Collaborative working; and Just in Time Learning template. The second layer focuses upon the instructional design of the portal itself. It considers the need for learning content to be modularised and supported by learning outcomes. This in turn, would allow for JIT learning. The learning content needs to be aligned with organisational objectives so as to have the relevance of training. The learning content needs based on Salmon's framework, supported by collaborative learning and collaborative working to provide SMEs with the benefit of timely training. The content itself can only truly be effective, if it is supported by both Technical support by the training vendor, and a two fold support mechanism is in place for the learning in the shape of internal support and E-moderator. It is important, that all training is employer led to ensure that the infrastructure for the training is in place. The third layer Technology and Development seeks to establish a culture for training and the technology required to take training within the workplace. The final level the portal itself is the training medium in its active state.

8.5.1.1 Refinement And Iteration

The results that come from the Evaluation process should provide a basis of refining the framework design. Overtime the design should adapt to the needs of the business. The iteration process of reflection and evaluation would allow SMEs to tailor the model specifically for their own needs. The framework by its very nature is generic and as such should adapt.

8.6 Triangulation

The Post Collaboration Model was exposed for critique to address the subjectivity in the interpretation of results from literature review and empirical research. The results from this process allowed for further refinement of the model. The Triangulation method (detailed in Chapter Two) used, addresses the subjectivity in interpreting data. The 'final' revised model is not only adaptive, but brings together traditional teaching methods with online learning for a blended learning approach that provides relevant and timely training to the workplace.

The first stage of triangulation resulted in the publication of model design (Samra *et al.* 2008). A collaborative paper submitted as conference proceedings was well received. As well the feedback from the presentation, a focus group was organised to discuss the content of the presentation and details of the model process. The second method was semi structured interviews with experts at Coventry University and the third was semi-structured interviews with External Experts, a combination of SMEs and local training groups. The findings from these methods were collated and the emerging themes were used as points of reflection. The result of which was certain changes being made to the model. The 'final model' captures these views and provides a complete, flexible and adaptive training model for SMEs reinforced with the notion that the Post Collaboration Model is accepted as valid and appropriate by experts in the field.

8.6.1 Emerging Themes

This section summarises the emerging themes arising from the model critique. Reflections of the critique provided by the three parts of triangulation have resulted in the presentation of the reoccurring issues in the final stage of evaluation.

- All experts to whom this model was presented, all agreed that the model is adaptive and flexible. The customisation approach to tailoring learning content was certainly a viable solution for SMEs and their resource and operational constraints.
- All were agreed, that when working with SMEs in manufacturing the age group of employees are generally mature. As such the exposure to training over the years can be minimal, however many have specialised skills used within their job. It is important to take the Andragogy view in learning. It is important that knowledge is a constructive approach and that training proposed is relevant to the individual.
- The relevance of training can be achieved within the workplace if it is aligned with the strategic direction of the business. However, if a strategic direction is not present, then alignment can be difficult. It was agreed that it is important that SMEs focus on establishing an infrastructure before training is taken. However, there needs to be a level of flexibility in the infrastructure, particularly in terms of documentation. It was felt the production of documentation does not have to mirror the level of detail found with Investors In People documentation. Though, it is not suggested as such, it is important that sufficient detail is provided, but perhaps not to the extent of IIP documentation.
-
- Figure 21 shows a model, which forms the basis of the training development process for an SME. The model highlights the main components that will make up the SME web based training environment. The model has three distinct building layers, they are: Learning Foundation; Adult Learning Process and Technology and Development. The incorporation of these three components

will bring about the development of an online training environment. It was felt that information on the model was limited. The model need to make explicit what constitutes each layer's elements. The simplistic nature of the model design does not appear to add value to the overall complexity of the process. Particularly the Adult Learning Process layer, the issues to be considered could be simplified, if an early awareness is present.

8.6.2 Changes To The Post Collaboration Model

This section takes on board the comments and suggestions made in the previous section. The main change made is to the appearance of the model (Figure 21). The model (Figure 26) presents the main elements that make each layer of the Post Collaboration Model. It makes explicit elements of each layer and removes the level of simplicity that existed in the initial model.

WeBTiE (Web Based Training Environment) is the Finalised Model and Generic Guidelines.

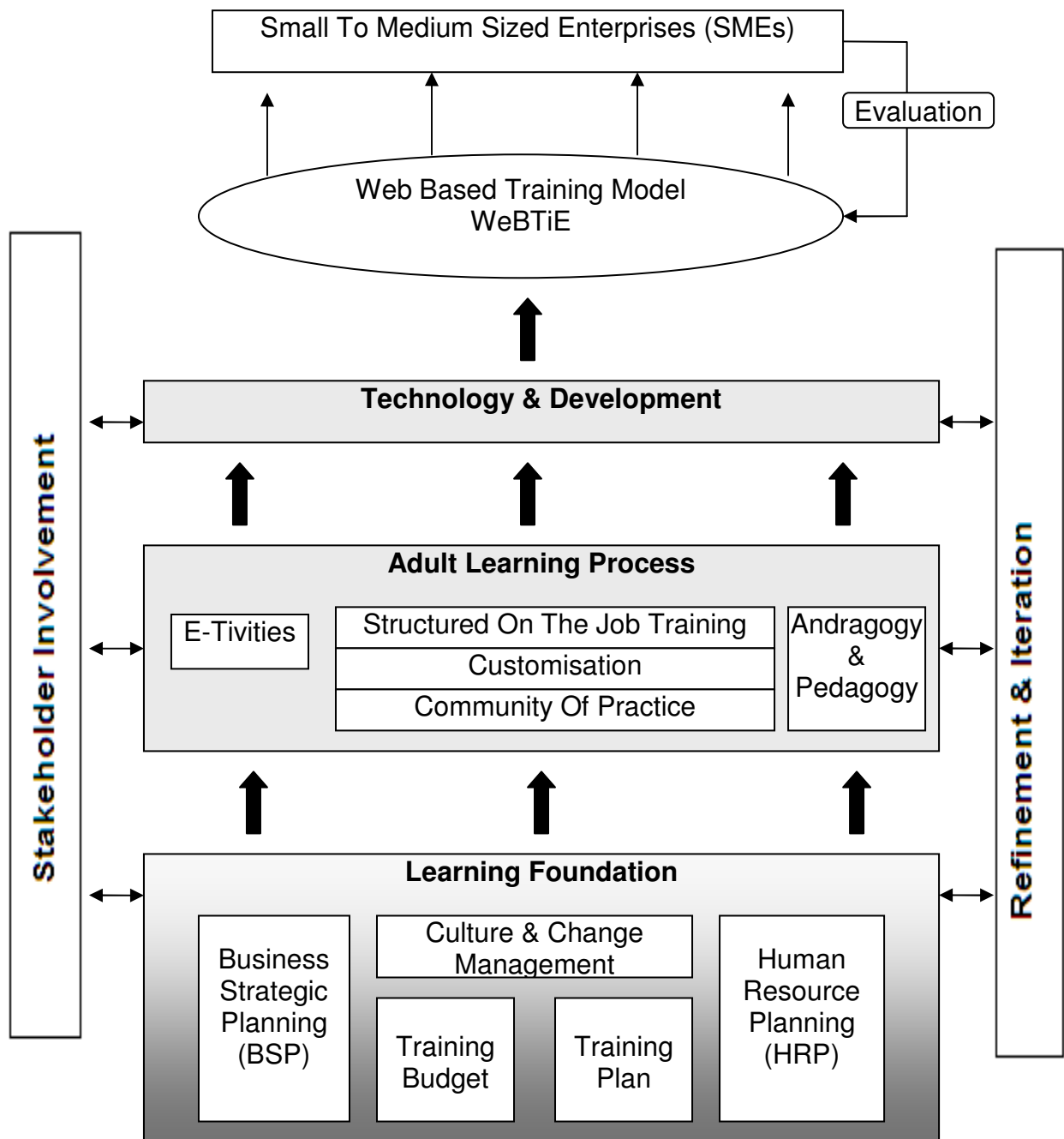


Figure 26: Final Post Collaboration Model

The functionality of the WeBTiE remains the same. However, it does reinforce Stakeholder involvement at each stage of system development and the need for refining the system design through reflection and iterating until user requirements have been satisfied.

8.7 Conclusion

WeBTiE presented in this chapter, attempts to allow SMEs to develop a portal that will allow training to be delivered to employees during work hours at the desktop, online. The model optimises learning opportunity, as it is informed by Andragogy and Pedagogy alike. The success of this model depends greatly on strong collaboration with the training vendor, employers, employees and the E-moderator. The roles of the individual in the development and implementation of the portal is complimentary to training success. Overtime, it is hoped the training portal will become a suite of training programs specific to the SME needs. It will evolve and adapt to new challenges in the face of competition and globalisation.

CHAPTER 9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Summary

Through the analysis of online training sites, it is clear that there exists a lack of cohesion between the learning theories and learning online. We all know that a teacher teaching in a classroom can use learning theories to reinforce their teaching approaches. The theories clearly state 'do's and don'ts' in teaching. Therefore, logic would serve to say that the principle should be carried forward to this method of teaching. The problem is that instructors have not clearly understood how this new medium would help learners to learn. Little thought has been given, as to how instructors can use this method, whether it is to reinforce teaching in the classroom (blended learning) or to deliver the teaching completely through this medium. Until the objectives or targets of teaching using online means are determined, instructors will not be able to deliver learning material with full advantage to the learner.

Research suggests that today's youth, who are increasingly growing up with the Internet and Web Based technologies are well prepared to engage in online learning activities that support interaction and collaboration. Online learning delivery models support interacting with peers in virtual spaces on team projects, engaging in online discourse and researching using web resources however many of today's online learners are represented by the Generation Xers and it will be the Nexters who will bring about a much more culturally accepting group of learners. This will lead to the need for new online training models where the issue of cultural change will be infrequent (facilitating constructive learning) would allow for the application of concepts to work-based practises making even more the learning and training experience relevant to the business. The model proposed in chapter eight, illustrates how to develop an in-house training programme for SMEs, by SMEs, that is adaptive, flexible in delivery and responsive to changes in competition and needs of the SME.

It should be noted that the guidelines illustrated in the previous chapter are not specific to manufacturing, they are generic guidelines and applicable for SMEs

regardless of their industry base. In addition, the final form of the framework has not been applied in the development of a training programme.

9.2 Statement Of Research Undertaken, Extent Of Contribution

This thesis is a culmination of literature review, empirical research and evaluation that has provided grounding to allow for the development of the WeBTiE. The model has been based on generic guidelines, which allow SMEs to build web-based programmes for in house training. The contribution of this research lies in the way in which S-OJT, E-tivities and the three sets of generic guidelines from chapter six are brought together bringing forth a tailored solution for just in time web based training.

WeBTiE's development has been an incremental process. The first stage was to establish understanding of current thought behind how adults learn, train and training provision for businesses locally and nationally. The next stage was ascertaining what the learning requirements are of a test group of SMEs. The application of the preliminary design within the Cawskills Project (CW2000), developed because of the first stage, led to the second phase of training model. Critique of the second iteration of the model provided WeBTiE.

Collaboration with ProEnviro gave this research insight into learning needs of SMEs within manufacturing and the methods used to train and upskill. The literature review led to the partial development of the Preliminary design, which was later used by CW2000, to develop an online training programme for SMEs. Understanding from reflections and evaluation techniques applied during and after the completion of training helped further refine the training model design.

The next phase in this research led to collaboration with CW2000 and the Cawskills project. The use of the training model with the modifications made from collaboration with ProEnviro, allowed for the research to test whether the model delivered effectively what it was designed for. The research once again called for evaluations, reflections and modifications. The final stage of this research led to semi-structured interviews, publication of WeBTiE and interviews with SMEs to

determine whether the training model is fit for purpose. The triangulation process helped to refine the design for a final time and more importantly affirmed conclusion made that resulted in the final design were the right conclusion to make, hence eliminating subjectivity.

The aim of the thesis is a systematic development of a method, based on generic guidelines to deliver training for SMEs, has now been achieved. WeBTiE is a normative model, in its present form, has not been used, to develop a training programme. As discussed later in this chapter, WeBTiE would be further subjected to evaluation and refinement, once it has been used for the purpose it was developed.

9.3 Critical Reflections

This section discusses to what extent the aim and objectives of this research has been achieved. It reflects how well the objective has been achieved and what could have been done to address any shortcomings. The reflections drawn during the course of this research are also brought together under the umbrella of the objectives.

The aim of this research was

the development of a method based on generic guidelines which address the barriers SMEs face in training by facilitating the integration and application of new educational technology in the workplace.

Achievement of the Aim, has been demonstrated in the previous section

Objectives

Establish understanding of the training provisions available to SMEs and why they are not presenting the same level of training uptake as larger businesses in the Coventry.

In chapter three and four, we ascertain the extent of training provision available to SMEs both in the local area as well as by government or private initiatives.

Specific training for the SME that addresses the operational demands, and are fulfilled by the little resources that may be available, are simply not present for SMEs, either through public or private initiatives. Training programmes provided from the likes of Advantage West Midlands or NSAMA do not provide the flexibility SMEs seek as they do not fit in with the operational demands of business.

The research deduced Manufacturing forms a large percentage of SMEs in both the West Midlands region and Coventry and Warwickshire sub-region. This group has a significant percentage of the employment population working in this industry. Despite its decline in recent years, the manufacturing sector continues to be a major employer in the sub-region. With the decline in the industry generally, we have a continuing level of unemployment from this sector. It is important to enable the people who are becoming unemployed within manufacturing and construction to seek employment in other sectors or in other jobs within this sector. To do so, it is imperative to have a skills set that employers require and are transferable.

Competition is ubiquitous in all industry sectors regardless of location. To overcome or at least gain advantage, it is important to employ the right people with the right skills. A business needs to be able to adapt to its' environment that inevitably will be dynamic. To adapt, the right skills set needs to be present. However, manufacturing which is heavily dependent on manual labour requires both specialised skills, understanding of technology relevant to the job and a sub skills set to enable the administration of activities. On this basis, it is very difficult for a SME in the Manufacturing industry to adapt to global competition, particularly where countries like India and China offer cheap labour. However, it is important that SMEs are able to adapt themselves to the dynamic global environment to stay head of competition. Manufacturing will always remain important to the future prosperity of the West Midlands economy. To continue to be a major contributor to its productivity growth it needs to respond to competition from emerging economies; production technologies; and ICT. To do this its infrastructure needs to change and this needs to begin with education and up-skilling.

However, as we found in chapter four, the extent of training provision currently available does not fit in with the business demand. The functionality, or the way in

which SMEs operate, differs greatly in relation to large organisations. Firstly, SMEs operate at an operational level concerning themselves with day-to-day activities more so and giving less attention to future direction, Mazzarol refers to this as “strategically myopic” (2004:1). This focus also gives little attention to training planning. Many SMEs simply do not have the dedicated resources for training because of financial constraints and as such the infrastructure for training is not in place.

It was also deduced in this chapter that those SMEs who do undertake a degree of training find that once training has been completed and changes have taken hold in the environment, the impact of training is minimal. Furthermore, there was difficulty in applying the training to improve work-based practises as there was little or no appraisal or evaluative process facilitating this.

There is much information related to training provision available to SMEs in Coventry and Warwickshire. However, one shortfall we found, there were no detailed study by local government, training providers or academics alike to understand exactly to why SMEs in the local area are not taking up training. It is widely accepted that resources and operational demands plays a huge part in the lack of uptake however, from this research it was found that problem to be much more deep rooted than that. Though, this is likely to be an area for further research, it is important that in order for initiatives such as NSAM to be truly successful there needs to be a more specific understanding of SMEs needs rather than generalisation and generalised solutions.

Establish understanding of the training and learning requirements of SMEs in the Coventry and Warwickshire area.

In chapter seven, we conducted two in-depth studies of Training Needs Analysis of SMEs in Coventry and Warwickshire area within manufacturing. We found there to be trends in training requirements. The widespread use of ICT in business activities was not paralleled by the skills level. The Administrators who used IT on a daily basis were not always equipped with an appropriate ICT skills level. Though ICT skills were the most common training requirement, it was not

the only training requirement. Other requirements ranged from Management Skills to Customer care skills.

Provide a critical literature review of Pedagogic principles, applicable in training and learning.

The application of learning theories to instructional design can help to optimise the learning experience. However, with the array of learning theories, it is difficult to determine which should be used in the training. The popularity of constructivism and its use in adult learning has gained much interest and clearly has a place in instructional design of online learning. Adult learning need to incorporate online instructional design principles and an understanding of how adults learn: Pedagogy and Andragogy. With consideration of adult learners we have and most importantly need to consider an added dimension, one which differentiates these learners from other learners, that is they have valid prior knowledge and experience.

In chapter six, we developed three sets of instructional guidelines to be used when tailoring the learning content and developing the Learning Portal. The guidelines have been considered from three Pedagogic principles: Behaviourism; Cognition and Constructivism. As we are looking to train adults an added dimension, Andragogy has also been encapsulated into the guidelines.

The development of the training portal would ultimately bring together a number of components for a complete package. The components would be: The learning content; communication support; technical support; and learning management. We have determined that training requires much support in order for it to be successful. This support mechanism should not only support learning, but facilitate reflection and collaboration. One of the difficulties associated with online learning is retaining, motivating and engaging learners. The use of email and a discussion forum can be used through the direction of, E – Moderator and Employers, to be a powerful set of tools to promote collaborative learning and collaborative working. The exchange of ideas between learners using these tools would help to promote learning and encourage the sharing of ideas. The

emphasis of deep learning is on depth of learning, rather than breadth of coverage. If values are to be changed, learning tasks need to be meaningful and appropriate to background knowledge with the focus on highest conceptual level. The intrinsic motivation enforcing deep learning needs to be encouraged in organisational learning to empower employees to challenge work-based practices currently used. The desire to improve practices in the light of changing trends, technology and competition can only take place when employees have the knowledge and ability to make informed decisions.

Assess the use of e-learning in training and the suitability of associated models with a view to derive a suitable model for use in SME training.

Chapter four contends that two aspects need to be considered as part of the development of the training programme development, they are the Learning Foundation and Adult Learning. It was suggested that in order to overcome the barriers associated with e-learning that a blended or hybrid learning environment is considered to be the development perspective of the guidelines. This approach will result in a training programme that is not entirely dependant upon the Internet for delivery. There are many problems associated with the Internet, the hardware and software used to operate it. It is important that the training programme can address this. If all training is provided via the Internet what happens if the Internet service Provider (ISP) fails or if the bandwidth is small. Video playing over the Internet will be extremely slow and frustrating for the trainee, if they are using a 56k modem to access the Internet, hence valuable SMEs time has been lost. These types of problems fall outside training support. To help address these problems the training provider would need to move away from total reliance on the Internet for delivery and look to a blended learning approach as we have proposed.

Many e-learning or online learning providers focus on the content rather than a blend of content, learning style, media, context constraints and support. Many SMEs who have broadband capabilities are moving toward the realisation for online learning and training. If knowledge becomes a business asset, then learning and training must be seen as a strategic movement towards business

advantage. Training providers need to be able to give a balanced programme that can exploit the Internet for delivery, provide content which is both timely and relevant, provide learning support for individual and groups and facilitate learning and provide the technological support when the training fails the SMEs.

It is important SMEs consider how to manage online training events within the workplace. It is vital that appropriate support mechanisms both within the workplace and online are available for learners, which are not only technical but also support learning. Support also needs to be available by line managers/supervisors and the E-moderator, as employees need to time and space to train along with learning support to deliver metacognitive knowledge into the workplace and at the same time provide the reassurance that these are value-add activities. It is important to motivate employees to train online to eliminate hostility and encourage employees to complete courses.

In chapter five we concluded that the model to carry forward for training with SMEs was Gilly Salmon's E-tivities model. The model embraces collaborative learning whilst maintaining the flexibility of allow for the integration of Structured On The Job Training. The five stage model is limited in terms of collaborative learning therefore the use of CoPs was recommended. The integration of these elements results in a model that provides the basis of design for training for the Cawskills project.

Develop an online training programme, collaboratively, delivering pre-determined training requirements.

Chapter seven detailed the empirical research carried out collaboratively with ProEnviro and CW2000. The findings from the previous chapters enabled the production of the Preliminary Design, which subsequently was used to design the training programme for SMEs.

The work with the collaborators firstly set to understand what the learning requirements were. The fieldwork carried out helped to isolate trends in the learning requirements of SMEs within the manufacturing industry. These were

used once informed by the organisational strategy, to develop a specific online training programme for work-based learning. The training portal, Cawskills, was a customised training solution for a cluster of SMEs with similar training needs.

This was a vital part of the research. It was the first opportunity to fully understand SMEs and in developing and delivering training to build knowledge and understanding of the entire training process and its affect on business. In order to develop a training model which would be fit for purpose, adaptable and generic, it was important to have an appreciation of all aspects of training, business, learning and culture. The fieldwork carried with two very different organisations gave invaluable insight into working and understanding SME and workplace training.

Evaluate using appropriate techniques the effectiveness of training undertaken by SMEs.

In chapter four we described the Evaluation process that needs to be taken to assess the effectiveness of training. The Kirkpatrick Model combined with the iterative reflections of S-OJT would introduce phased evaluation during the course of the training that could be initiated by the employee or the manager/supervisor. The four factors that are considered: Reaction; Learning; Behaviour, and Results allowed the SME and the employee to reflect on varies aspects of training effectiveness and process improvement.

Utilise empirical work and literature to bring together and develop a set of generic guidelines to deliver work-based online training for SMEs.

Chapter eight provides a detailed description of the result from bringing together the empirical work and the literature reviews. Web Based Training Environment (WeBTiE) is a tailored online training solution specific to a SMEs' training needs. The portal within which online training is provided is the collaborative efforts of the Employer, Employee and Training Vendor. The portal encapsulates not only the learning content, but provides the learning support necessary to guide employees through the training and reinforce work-based practises with the use of a Community of Practice. Unlike many other training models, the originality of this

model, is that it combines Pedagogy and Andragogy principles in the development of the training programme, along with e-learning model, E-tivities for Structured On The Job Training. The generic nature of this model allows it to be adaptable for SMEs in a variety of industries, the tailoristic feature provides the flexibility necessary to permit the adaptability.

Expose the finalised guidelines for critique and use the evaluation to make appropriate modifications for the final version.

Chapter eight provides a detailed description of WeBTiE. It explains what the model does and illustrated how the model is to be used. Towards the end of the chapter we can find details of the critique for which the model was exposed. The triangulation method used was invaluable as it enabled the issue of subjectivity to be addressed. Three key types of experts were targeted for feedback, they were, experts at Coventry University, External Experts: Academics and local training groups and SMEs (field specialists). The results of semi interviews, presentation and focus group were used to refine WeBTiE once the emerging themes were ascertained. Section 8.5 details the emerging themes that arose from this process and the finalised model has been presented in the latter end of chapter eight.

The 'final' revised model is not only adaptive, but brings together traditional teaching methods with online learning for a blended learning approach that provides relevant and timely training to the workplace.

In many ways the achievement of this objective was dependent upon a Research Design and Process which was exploratory, inductive and reliant on the need for constant reflection. The need to question the findings and design at every stage helped to deliver a robust design, relevant and grounded training model.

9.4 Further Research

The research that has been conducted has many possibilities for further research. Some of the more significant areas are:

- How WeBTiE can be used for collaborations with organisations such as Business Link that provide training with a view of developing community training programmes that addresses local learning needs of SMEs?
- How can collaboration with Training Vendor(s) further enhance the extent to which tailorism and customisation of content be conducted to deliver training to SMEs?
- How would the use of WeBTiE be extended for use within Higher Education, and its collaboration with local SMEs to provide online training?
- What are the implications for the WeBTiE, when providing training other than ICT

9.5 Conclusion

The originality of this research provides contributions to knowledge. The novelty concerns the fact that through the growth of networking many new services and possibilities are available for online learning. Little attention has been paid to how SMEs can take the best advantage from this new environment. The innovative aspect of this research, has been the application of current training practises alongside, Pedagogic and Andragogic principles to the development of future training schemes delivered online. The tailored training model available now for SMEs will help to present many new learning opportunities that up until now have been fully exploited.

The main limitation of this research is that final model has not been implemented. It is recognised that further research is required in this area to identify the possibility of refinement. The empirical research was carried out with SMEs in manufacturing. As an area for further development and research, collaboration with SMEs in other industry sectors could be considered. The design of a training programme, using a second test group would provide a comparison in the use of the WeBTiE and in turn the opportunity to analyse and evaluate the model's use, application effectiveness and to address the question, does the design require change?

It is recognised that there are a number of limitations to this research, and there are a number of areas for further research that could be addressed. The critical reflections, particularly from chapter eight, recognise both the limitations and weaknesses of the proposed model and guidelines. However, every effort has been made to address this to both reduce and remove subjectivity in interpretation and to ensure that the model does what it sets out to do, provide 'A Systematic Method to Develop Work-Based Training For SMEs'.

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APPENDIX 1 Training and Infrastructure

- **Business strategic plan**

To understand what are the business aim, objectives and mission. In Coventry and Warwickshire just over 60% of the businesses have a business plan (BMG 2006:79)

- **HR plan**

This document sets out who is working in the business and what is their role. The job description document focuses on the skills and qualifications the employee has. Though this is a legal requirement the importance of this document is it will enables the employer to understand what skills are required for a position. The skills requirement for a job needs to be reviewed time to time by an employer, thereby allowing you to see whether the remit of the job has changed. SMES who operate in dynamic and competitive environments will find that the business changes to meet the demands of the market. These changes are reflected in the employee's roles and responsibilities. Hence, with changing roles, responsibilities and skills it is important to understand what the requirements or the business are and how they are fulfilled. By fully understanding the needs of the business can SMES make a step towards understanding the training needs requirement.

In Coventry and Warwickshire just over 30% of the businesses have a HR plan (BMG 2006:79).

- **Budget**

No training can be free. Each programme has associated costs. To train employers ultimately the employer will be paying for the employee to undertake the training. Before such a commitment can be the employer will need to decide how much they are willing to invest in the programme. The budget set out the allocation of financing to training for specific people. This document overlaps with the Training plan.

In Coventry and Warwickshire 40% of the businesses have a Training Budget (BMG 2006:79).

- **Training Plan**

This document sets out who will be required to undertake training. The development of this document can only take place when an evaluation of the organisation has taken place. The training plan needs to match the overall objective of the organisation and understanding the skills requirements of individuals based on what their job description stipulates. The matching process enables an informed decision to be made (Bee & Bee 1994).

In Coventry and Warwickshire just over 50% of the businesses have a Training plan (BMG 2006:79)

APPENDIX 2 Andragogy v Pedagogy

Source: Gibbs & Habershaw (1997:10)

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APPENDIX 3 E-tivities

The model has five key stages, each of which can be subdivided into Technical support and E-Moderating. The five stages: Access and Motivation; Online Socialisation; Information Exchange; Knowledge construction and finally Development are progressive stages. Each stage requires the learners to master certain technical skills and these activities are supported by E-Moderating skills. The E-Moderator who facilitates e-moderating role is responsible for engaging participants so that knowledge constructed is usable in new and different situations. The goal of the E-Moderator for this kind of learning is to enable meaning making rather than content transmission.

At stage one, Access and Motivation, the e-moderator adopts the role of ensuring access and welcoming and encouraging. Use of time and motivation to take part becomes an issue from the very beginning. Motivation is an essential element to get participants through the early stages of use of the hardware and software systems and towards engagement and mobilisation of learning. In the next chapter, we will look at how to motivate employees when training online in more detail.

E-tivities at this stage, needs to provide a gentle but interesting introduction to using the technological platform and acknowledgement of the feelings surrounding using technology and meeting new people through the online environment. This stage would be considered very beneficial to novice e-learners whose familiarity of online would be limited. The support provided will help to encourage the learners to continue with the training rather than stopping at the first hurdle.

At stage 2, we start to see the creation of an online micro-community (Salmon 2002:20) through active and interactive e-tivities. How long the community will exist for depends on the needs of the community participants. Salmon recognises the value of community of practice (2002:22) and encourages the e-moderator to help learners understand the value of working together. The e-moderator's role is to build the 'bridges' for all the participants. At stage 3, information can be exchanged and co-operative tasks can be achieved. The big advantage of

asynchronicity is that everyone can explore information at their own pace and react to it before hearing the views and interpretations of others.

Participants' learning requires two kinds of interaction: interaction with the course content and interaction with people, namely the e-moderator(s) and other participants (Salmon 2002:24)

The need for knowledge of tools for remote access to information and knowledge of strategies for purposeful information retrieval is important. The role of the e-moderator is to provide direction through messages of encouragement. The information in E-tivities need to be short and there so as to 'spark', encourage interaction and initiate action. Furthermore, Salmon states that it is important for the e-moderator to ensure the postings from discussions are summarised systematically to prevent 'lurking'⁹.

By stage 4, it is hoped that participants begin to recognise one of the key potentials of text based asynchronous interaction and take control of their own knowledge construction in new ways. Development of E-tivities needs to promote discussion or knowledge development aspects at their core. Critical, creative and practical skills allow learners to build on their internal representation of knowledge, linking it directly to their personal experience. At this stage we see learners moving from knowledge transmission to authors where tacit knowledge and its impact are evident (2002:31). E-moderators need to build and sustain groups online. The ability to weave together key points from E-tivity responses is important. They need to be able to pull together overall conclusions in summary without discounting those who are still exploring or thinking of ideas.

At stage 5, learners become ultimately responsible for their own learning and that of their group. With metacognitive learning skills learners are able to build on the ideas acquired through the e-tivities and apply them to their individual contexts. Learners and e-moderators will stop wondering how they can use online participation and instead become committed and creative through critical thinking and reflective practice (2002:33). Learners are now in a position, whereby, in

⁹ Term used to describe participants not engaging in discussion, but rather have a passive role in training or learning

attempting to understand a problem or explore a scenario they are able to critical assess it and through the reflective process, are able to deal with different ideas to come to a solution. This state of independent learning is vital to an SME, employees who are equipped with skills where they can critique and reflect upon practices and apply their knowledge and understanding to resolving scenarios within work can allow the business move forward in the face of competition.

APPENDIX 4 Organisational Training Needs Analysis

SMEs were asked to respond to questions and provide information about the business. Also they were encouraged to add further comments at the end of the form. The questions were as follows:

1. Please describe the nature of your business.
2. Number of employees within the organisation?
3. Do you have a mission statement?

Please state your mission statement.

5. What are your aims and objectives for the organisation?
6. Organisational structure of the business
7. Please describe the problems you are currently experiencing in detail.
8. Do you have any of the following accreditation
Investors In People; ISO 9000; ISO 14000 or other.
9. Do you have a policy relating to training employees?
10. What, if any, education or training does your organisation purchase or provide for employees?

Present Training Arrangements Within The Organisation

11. Who is responsible for providing training in the business?
12. How much money is spent training?
13. What is the scope of the present training?
14. What plans are there for training new and existing staff?
15. Do these cover job and career training?
16. Are these arrangements regarded as satisfactory?
17. What are the likely future developments affecting the organisation?
Political; Economical; Social; Technological and Legal.
18. What future training needs have been recognised in the organisation?
19. What plans have been evolved to meet them?
20. Which training requirement(s) do you believe needs to be a priority?

21. What resource will be required for these needs?

Information And Communication Technology

22. Do you use computers within the business?

23. What do you use the computers for?

Word Processing; Communication; Accounting and Finance; Presentation; Statistical Analysis; Desktop Publishing; Databases; Administration (Payroll, Invoicing or Statements) or Other.

24. Who uses the computers within the business?

Management; Administrator; Everyone; Operators.

25. Rate the employee's skills (above) in using computers:

None, Beginners, Intermediate or Advanced

26. Are you connected to the Internet?

27. What is your connection type?

28. Do you connect to other organisations electronically?

29. Do you have an Internet website for the business?

30. What is the Internet commonly used for?

31. When are you planning, if at all, your next computer purchase or upgrade?

NOTE: These are the questions asked, not the actual form used.

APPENDIX 5 Individual Training Needs Analysis

Employees were asked to respond to questions and provide information about the business. Also, they were encouraged to add further comments at the end of the form. The questions were as follows:

1. List your key areas of work.
2. What abilities does your job require?
3. To what extent do you think you fulfil these abilities?
4. What do you like best and least about your job?

Current Skills

5. What are your main strengths?
6. Areas where you think your skills and abilities could be improved?

Development In Your Work

7. Details of any changes or development in your work, including any special duties you have undertaken in the last year.

Performance

8. How successful have you been in achieving the objectives and reaching the standards set in your job description?
9. Identify any particular strengths or weaknesses relating to your performance.
10. Describe any actions to be taken to build on strengths and help overcome weaknesses.
11. What were your accomplishments for the year?
12. What objectives did you achieve and which did you not?
13. How could your Line Manager help you do a better job?
14. Is there anything that the organisation or manager do, that hinders your effectiveness in doing your job?
15. What changes would improve your performance?
16. Does your present job make the best use of your capabilities? How could you be more productive?

Training

17. Details of any training you received in the last five years?
18. What training or development do you think you need to do you current jobs more effectively?
19. What training or development do you need to develop yourself and your job further?
20. What do you expect to be doing in five years?
21. Details of you Action Plan for the next 12 months (how objectives will be achieved)

APPENDIX 6 Student Feedback Form

In order to make any improvements or changes to the way the course is delivered we would like to welcome any feedback you have.

1. Did you find the Induction session easy to follow?

Very useful ☐

Useful, but would like to see other materials discussed ☐

Not useful at all ☐

Have not yet attended ☐

Please give details

2. Were you able to log into the course after your induction session?

Yes (go to Question 4) ☐

No (go to Question 3) ☐

Have not tried ☐

3. If not, were you able to get suitable technical support to help resolve the problem and how did you go about getting help?

4. Did you have any problems downloading the WebPlayer?

Yes (go to Question 5) ☐

No (go to Question 6) ☐

Have not tried ☐

5. If yes, what problems did you have?

6. Has the course been easy to follow?

Yes (go to Question 8) ☐

No (go to Question 7) ☐

Have not tried ☐

7. What difficulties have you had with the course?

Time ☐

Equipment ☐

Materials ☐

Other – please give details ☐

8. Would you prefer to come into the centre scheduled structured sessions?

Yes ☐

No ☐

9. For which module would you like structured session organised for?

Basic concepts ☐

Managing File ☐

Word Processing ☐

Spreadsheets ☐

Databases ☐

Presentations ☐

Information and Communication ☐

10. Have you used the Support area?

Yes ☐

No ☐

If not, why

If yes, how have you used it and has it been useful.

11. Have you been able to apply what you have learnt to your job?

Yes ☐

No ☐

Have not tried ☐

12. Have there been any barriers to your learning? E.g. Time, equipment, lack of support, Course too difficult

13. What aspect(s) of the course have you found help you learn more effectively?

14. What changes, if any, would you make to the course and why?

15. How to you think we could help you more with this course?

Thank you for taking the time to complete this form. Please fill in your details below and return it in the envelope provided (no stamp required)

Name: _____ Company _____

APPENDIX 7 Employer Of Feedback Form

Companies were asked to respond to nine questions and encouraged to add further comments at the end of the form. The questions were as follows:

1. What procedures do you have in place currently for accessing the training needs of employees, and selecting which courses to send them on?
2. How did Cawskills training fit into this?
3. What benefits as a company have you seen from the training?
4. Have any problems arisen from the training?
5. Has the training highlighted any gaps in the training needs of the employees?
6. Have there been any problems with employees and distance learning?
7. Were employees given times to use the companies' resources in order to do the training?

If so, how many hours per week on average were they given?

8. If we were to offer similar learning approach for training in the future, would you be interested in taking part?

If yes, what aspects of the train approach currently offered would you like to see offered?

GLOSSARY

Andragogy The art and science of helping adults learn.

Action Research Research strategy concerned with managing change, which requires a close collaboration between researchers and practitioners.

DFES Department of Education and Skills

DIUS Department for Innovation, Universities, and Skills

E-Commerce Consists of the buying and selling of products or services over electronic systems such as the Internet.

Economy An economy is the ways in which people use their environment to meet their material needs. It concerns the activities related to production, exchange, distribution, and consumption of goods and services of a particular area.

E-Learning The use of the Internet technologies to deliver instructional content that enhance knowledge and performance.

Ethnography A research strategy concern with understanding and then describing, through first hand study, the social world of the research subject.

ICT Information and Communication Technology.

In-House Term to state within the workplace.

OJT On the Job Training

Manufacturing Includes any businesses involved in the transformation of raw materials into finished goods for sale.

NVQ National Vocational Qualification

NSAMA National Skills Academy for Manufacturing.

Pedagogy The art and science of teaching children.

Skills Gap The difference between the skills required for a position in the workplace and the skills an individual possess.

SME Small To Medium Enterprise

S-OJT Structured On the Job Training

Work Based Learning see **Work Based Training**

Work Based Training or Work Based Learning The term is used interchangeably to mean training organised by the workplace regardless of whether on site or off site.