VOCATION FOR VOCATIONS SAKE

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Abstract

Under the Coalition Government the Education system within the UK was subject to much change and the Further Education section was among the most affected. With the funding strategy changes, the move from established National Qualification Framework (NQF) courses to Qualification Credit framework (QCF) caused disruption and the end to the traditional vocational model in some disciplines. It is on course model changes in IT and the attempt to identify the delivery of robust vocational skills that this dissertation will focus. This research will present a curriculum model that maps to a teaching framework for developing computing practical or computer / Information Technology (IT) / network engineering (vocational) skills at level 3, which has developed in response to external levers. This study compares the experiences of learners within the context of their Level 3 IT vocational course from two Further Education Colleges in the North of England. This research is based upon empirical research and experience conducted while teaching the curriculum, is a theoretical model of best practice and identifies a holistic view of skills development throughout the IT curriculum in response to changes in college, Government and economic policy. The paper will critically assess this Vocational Education and Training (VET) model, using a wide range of qualitative and quantitative data including survey data, interview findings, examination of qualifications frameworks material also the student experience, success rates etc, to determine the success or otherwise of this IT VET model.

This research aims to contribute to existing knowledge in the following areas:

- The study will examine Government Education policy interventions and initiatives from 2010 to 2014 which are directly related to the provision of VET at level 3 for 16+ learners.
- It will further attempt to identify coherence through courses by the exam boards pre and post the policy changes in terms of assessment methods
- The case study will present a report on an empirical enquiry undertaken in 2010-2015 under the Coalition Government which examines the relationship with VET in IT at level 3 and skills transfer at two Further Education Colleges in the North.
- The intention is to establish if the evidence of skills transfer on the vocational level 3 IT programs support the theory of improving the economic market in supplying a skilled workforce and looks at the interaction and interface between the level 3 IT provision and progression

The paper will consider how the identified external levers affect the structure and delivery of vocational curriculum so that a deeper understanding may be reached.

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List of abbreviations

ACM	Association for Computing Machinery
APPG	All-Party Parliamentary Group
AVCE	Advanced Vocational Certificate of Education
BCC	British Chamber of Commerce
BIS	Business Innovation and Skills
BTEC	Business and Technology Education Certificate
CCNA	Cisco Certified Network Administrator
CEDEFOP	European Centre for Development of Vocational Training
C&G	City & Guilds
DfE	Department of Education
DfES	Department for Education and Skills
DfSF	Department for Schools and Families
EMA	Education Maintenance Allowance
ERA	Educational Recording Agency
ESECT	Enhancement Student Employability Co-ordination Scheme
FE	Further Education
FEC	Further Education College
FECA	Further Education
FEFC	Further Education Funding Council
GCE	General Certificate of Education
GCSE	General certificate Secondary Education
GLH	Guided Learning Hours
HE	Higher Education
HTML	Hyper Text Mark-up Language
IEEE	Institute of electrical and Electronic Engineers
IFS	Institute for Fiscal Studies

IT	Information Technology
ITC	Information, Technology & Communications
KPMG	Klynveld Peat Marwick Goerdeler
LEA	Local Education Authority
LO	Learning Outcome
LSC	Learning Skills Council
LSDA	Learning and Skills Development Agency
MCSA	Microsoft Certified Systems Administrator
NAS	National Apprenticeship Service
NICHE	National Institute for Community Health Education
NCF	National Commissioning Framework
NQF	National Qualifications Framework
NEETs	Not in Education, Employment or Training
NICHE	National Committee Enquiry into Higher Education
NVQ	National Vocational Qualification
OCR	Oxford & Cambridge
OFSTED	Office for Standards in Education,
OECD	Organisation for the Economic Cooperation and Development
QCF	Qualifications Credit Framework
RPA	Raising of Participation Age
SFA	Skills Funding Agency
VET	Vocational Education and Training
SC	Skills Council
SFA	Skills Funding Agency
SME	Small to Medium Enterprise
WBL	Work Based Learning
YPLA	Young Peoples Learning Agency

YTS	Youth Training Scheme

Introduction

This research is an empirical study in education research examining the experience of learners on Level 3 IT pathways in vocational education between 2010 and 2015, under the Coalition Government. This field of enquiry is centred in the field of Information Technology (IT) / Computing vocational qualifications in their broader meaning within the changing qualification frameworks. The aim is not to highlight any shortcomings of delivery by tutor or class but rather to examine how framework changes under the Coalition Government affected these learners and their views of their course(s).

Supplementing the knowledge base in educational policy reforms and the vocational education and training (VET) field may bring benefits for other researchers. Improving the understanding of the vocational learners' perspectives may support further research and development into progression and vocational education. This research might be effective as a means of data generation or indirectly by informing the educational development of learners.

This study presents the survey results of 141 vocational IT learners and the experiences and views of a further six learners who studied before and during the changes of qualification frameworks in 2010/11 under the Coalition Government. These views are presented thematically and complement the data collected from the surveys. The study identifies areas that might be notable for further research and touches on any likely bias in the recruitment of interviewees and interpretation of findings.

Chapter One - Background

Central to understanding the impact of changes of delivery and content for learners on their level 3 IT vocational course 2010-2015 is an understanding of the policy changes and their levers under the Coalition Government. Policy drivers are identified within this timeframe and an overview of important relevant policies and reforms are examined.

The general election on 6 May 2010 had an inconclusive result and the UK then had a Coalition (Conservative – Liberal Democrat) Government for the first time in seventy years. This

Government replaced New Labour who had been in power for 13 years. The Department of Education (DfE) was established and all Education and Skills policies came under their jurisdiction. This new Department replaced the previous Department for Schools and Families (DfSF) and merged with the Department for Business, Innovation and Skills (BIS). This merging of departments and new Government should have been a great opportunity for policy reform and change for the good. One such policy was the raising of the participation age (RPA) from 16 to 17 in 2013 and 18 in 2015. At the time, the RPA was predicted to increase the demand for 'hybrid' qualifications, those of a vocational nature with an emphasis on the academic content. These qualifications offering a solution for learners to keep their options open for 16+ study while gaining vocational knowledge and skills for the workplace.

This period of change also questioned the wisdom and effectiveness of the 14-19 Diploma introduced by New Labour. Both Labour and the Coalition Government agreed that there was a need to improve education and skills vital for UK competitiveness in the market and for the UK's economic well-being. The raising of the RPA might be seen to be an attempt to address those learners that may otherwise not stay in education or be rejected from the academic pathways or traditional pathways. Evidence of the Coalitions' approach to policy change for young people was found in *Positive for Youth: a new approach to cross Government policy for young people aged 13-19* (DfE,2010) which outlined changes within the parties relevant departments. Researchers such as Garthwaite (2011) commented that the joint party were focussing on the supply side of labour rather than the demand and had done little to address this. Painter (2012) goes on to state that openness, transparency and decentralisation, while subject to much discussion, had no evidence of change since New Labour within education.

Policy levers and drivers

Coffield writes that policy 'levers' are mechanisms deployed by the state to bring about change (Coffield et al, 2008). These levers then can be used as leverage in Further Education (FE) for policy implementations and may consist of targets, funding or inspection. This research will look at how the policy changes under the Coalition Government impacted on FECs in terms of vocational delivery within IT and looks at how the changes manifested into the classroom and delivery and how this affected the learners' experience. This research

examines the how policy levers at national level are implemented within the curriculum and how these levers changed the IT vocational framework within FE under the Coalition Government. According to Young (2011) qualification frameworks are designed or introduced to "overcome or alleviate particular problems" Young (2011, p.1.) The credit and qualifications framework change is at the centre of this research.

The 14-19 yr provision remains dominated by divisions between curricula and qualifications Young (2011). Gove, former Secretary of state for Education 2010-2014, in his EDGE Foundation lecture, stated that '*we remain a country that under-values practical skills and knowledge. To label a course as 'vocational' is tantamount to stating it is designed for those who have been rejected for academic courses as lacking abilit*y' (Gove 2010a). Is it then any wonder when employers prefer academic qualifications over vocational qualifications when recruiting new employees.

Educational policy and politics - a brief history

The review begins with a brief exploration into the history of Educational Policy under various political parties in order that the reader understands the various changes and relationships between policy and FE provision. The research draws largely but not wholly on literature relating to educational research and examines the role that skills definition in IT and delivery models affect the learning outcomes and perceived success for the learners thus providing justification for the study.

The 1990s saw a qualification growth (and employment demise) and while the range of qualifications and attainment numbers grew significantly, critics such as Phillips (1996) claimed the system was a sham. There was a widely held belief that vocational courses had little to do with employability skills (DfEE 1995a).

The Kennedy report (1997a) and its promotion of LifeLong Learning (LLL) saw a move towards education or learning to National Vocational Qualifications (NVQ) level 3 status, which at the time, had very low standards (Armitage et al, 2007 p.29). In contradiction, the Learning and Skills Council (established in 2000) underlined further sector divide between FE and HE. As James et al comment, colleges adapting to external policy changes was considered an

interactive process with rising interventions form such responses (James and Biesta, 2007). Wallace and Hoyce (2005) comment ' to adapt particular reforms to make them work' (Wallace and Hoyce, 2005, p.12) was more a singular prescribed approach to policy change unlike James and Biesta who state that it was a continuous changing process (James and Biesta ,2007).

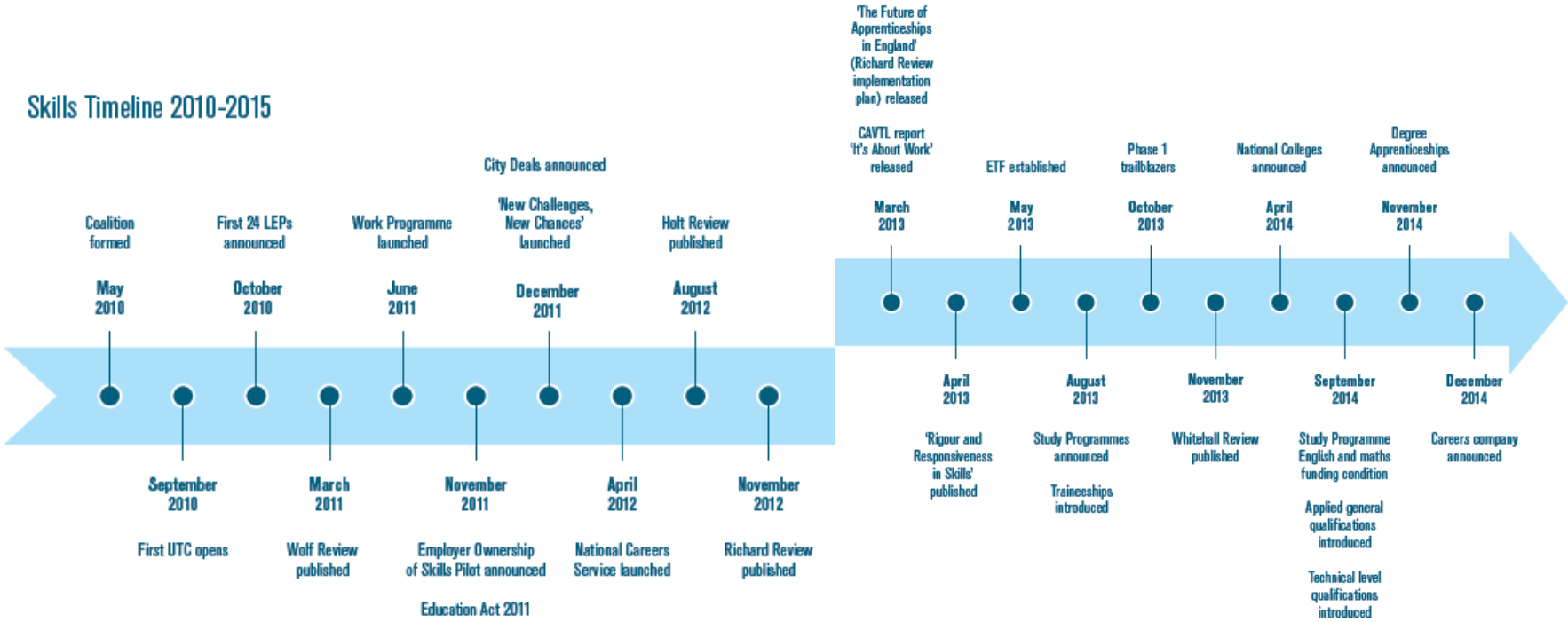
2010 Policies pre Coalition election

Post 16 Education delivery was the responsibility of the Skills Council from 2001 until 2010 in England and Governmental policy responses included Train to Gain and the 19-25 entitlement. In May 2010 the responsibility of training and delivery was passed over to the Young Peoples Learning Association (YPLA) and the Local education Authority (LEA) and all 19+ learning came under the SFA, an executive agency under the BIS.

Literature on the specific issue on the impact of different types of 16+ provision on pupil attainment is limited (Morris et al, 1999, Owen and Fletcher, 2006, Schagen et al, 2006). But what (usually administrative) data there is indicates that there is little difference in performance between FE provision and 6th form schools or colleges once intake and funding has been taken into consideration. Stanton and Fletcher (2006) note that value added can be affected by the subject mix and that given that FE offer a wider range of subjects and largely vocational ones, this is reflected in the value added statistics and success rates.

It is also important to consider that attainment and achievement affects funding. This equates to schools and FE receiving different funding levels despite their differential effectiveness. Whilst this is not focused on in this report, it is worth noting that there is a funding deficit. In 2003-2004 the Learning Skills Development Agency (LSDA) identified that 6th form schools gleaned an average of 16% higher funding than FE colleges and 6th form colleges. Klynveld Peat Marwick Goerdeler (KPMG) later identifies that the level had reduced to 9%. These figures do however highlight the differentiating funding capitas across the sectors which may impact on the quality type of provision

Figure 1 Key policy changes between 2010 and 2015



Skills Commission : Guide to the Skills System

According to Tait (2009) the Qualifications and Credit Framework (QCF) introduction was part of a national strategy to raise educations and skills levels by improving and adding to the existing framework NQF. He went on further to state the advantages;

- A more clear and transparent national qualifications framework
- Improved recognition and status for vocational learning / qualifications
- Greater flexibility, motivation and encouragement for learners through unit and credit based learning
- More relevant qualifications for employment employers and learners
- Development of non-traditional progression routes into HE based on achievement of agreed units, credits and qualifications
- Articulation / integration with HE qualifications and credit systems, and
- Use of web based technology to enhance recording of achievement and information, advice and guidance systems.

(Tait, 2009)

Davey and Fuller however argue that this new framework highlighted the weakness of 'skills' or vocational education in England (2010, p.24) claiming that the division between academic and vocational education had not been embraced in the frameworks design and further that unlike the academic counterparts, vocational education was unstable due to constant policy change born from social, economic and political drivers. In a more recent report in 2015, OFQUAL discussed the provision of a newer qualifications framework, Regulated Qualifications Framework (RQF) stating that

> *We are withdrawing the rules of the Qualifications and Credit Framework (QCF). We took this decision because we found that the rules did not always enable the most appropriate qualification and assessment design.*
>
> *(Gov.uk, 2015)*

Vocational Education – an overview

'*Vocational qualifications in the UK do not directly 'qualify' people to work in a particular occupation*'

(CEDEFOP Report, 2011,p.13)

Vocational qualifications have historically struggled with credibility, in part this can be seen to be because of their lower status than the more traditional academic qualifications such as the A level, but paradoxically, according to Aynsley and Crossouard, because of *'the incessant changes that have arisen in attempts to improve their status*'. (Aynsley and Crossouard, 2010 p.131). Acquah and Huddleston comment that vocational programs are often seen as '*poor*

comparisons' with academic courses due to the combing of content, process and context (Acquah and Huddleston, 2014, p.4).

Bathmaker comments that vocational education is *'used as a means of progression to both employment and higher levels of education, and is therefore pulled in multiple directions and influenced by stakeholders with different, sometimes conflicting interests*' (Bathmaker, 2013, p.89). According to Oates in a report for Cambridge Assessment, Higher Education (HE) is 50% is vocational (medicine, law, surveying, accountancy etc) which provides the link between professional and academic bodies but also validates programs and assessments (Oates, 2013, p.9) This is further endorsed in a report by Organisation for Economic Co-operation and Development who state '*Education and training for some high level professions such as medicine and law meet the definition even though they are not normally described as VET*' (OECD, 2010,p.26)

In 2011 the Department for Business, Innovation and Skills (BIS) published '*New Challenges, New Chances: Further Education and Skills System Reform Plan: Building a World Class Skills System*' which confirmed the establishment of an independent commission on Adult Education and Vocational Pedagogy. The stated purpose of the Commission was to 'ensure there is a clear sector-owned policy to support outstanding teaching and learning in FE, including making full use of the potential of technology' and to:

- bring together industry, teaching training colleges, professional associations and practitioners in the FE sector;
- explore how the best colleges and providers work with employers; and
- set out the standard expected of a good learning opportunity for an adult and an apprentice, and define a range of effective pedagogical approaches. (BIS, 2011, p16)

In contradiction with these objectives, the Coalition Government cut the funding for the 16-19 provision (if learners already had a level 2 or 3 qualification) and the 19+ had no provision financially. The replacement vocational QCF courses had no embedded functional skills and neither did the Guided Learning hours (GLH) allow for them. As the enrichment funding has been slashed; '*entitlement funding for activities such as tutorials, enrichment activities and additional courses was reduced from 114 hours per year to 30 hours in 2010*.' (NUT, *Sixth form colleges, 16-19 funding 2016*, p.1) Further Education Colleges (FECs) cannot make provision for the inclusion of these basic fundamental skills. In line with the funding cuts and framework

changes the newer format of courses for level 3 IT were designed for achievement of the learner by giving them as many possibilities to pass as they needed thus ensuring achievement. Ainley (2013) comments that the 'transparency' of vocational qualifications worsens the skills deficiency of the courses by measuring the outcomes, these will have been designed by breaking down elements of the course and be more achievable. He identifies that learners are then taught to the test and claims that subject knowledge and understanding were 'things of the past'. Ainley (2013, p.53).

Qualification frameworks

NQF

The National Qualifications Framework (NQF) was developed in the mid 90's, in response to the development of National Vocational Qualifications in the late 80's (Young 2003). The NQF was developed as a framework to encompass the spectrum of vocational and academic qualifications through to post-graduate and Doctorate. Of course, a problem with the notion of creating 'levels' of award, (Level 2 the equivalent of 5 GCSE's at A* to C, level 3 to two A levels or equivalent – required for HE entry) is that it does not represent the standard to which the qualification was gained. The variables to be measured are disparate and uneven and some qualifications are context based. Some of these level 3 qualifications were designed for access or entry to University and others translated to the work place, currency in the labour market. The Business and Technology Education Council (BTEC) Diploma was seen by some to represent a hybrid qualification as it covers many syllabus areas, respected by employers and popular with students and parents (Davey and Fuller 2010).

The previously funded NQF structure had to be recognised by at least three regulators in England, N Ireland and Wales. NQF qualifications were grouped together according to their difficulty and the levels were based on competence, skill and knowledge, this then meant that qualifications at the same level may take different amounts of time to complete.

QCF

The QCF was launched in 2008, designed on a credit based system which allows for progression and interchangeability of the units or credits. By 2011 most vocational pathways were converted to be QCF accredited. Initially the framework was designed to allow for Apprenticeships to fit and other Government funded programs.

The QCF contained three qualification titles:

- Awards 1-12 credits
- Certificates 13-36 credits
- Diplomas 37 credits or more

Each qualification contained the following information:

- The level of the qualification
- The size of the Qualification (Award, Certificate or Diploma)
- Details indicating the content of the qualification.

The vocational QCF courses have no embedded functional skills and neither do the Guided Learning Hours (GLH) allow for them as the enrichment funding had been dramatically reduced from 114 hours per student per year to 30 (www.unison.org.uk). These enrichment hours provided valuable input from teachers for tutorials and extra tuition as well as extra-curriculum activities. They also allowed for essential basic skills practise such as English, Maths & ICT.

Skills

A taught skill can be seen as one that is learnt in the classroom and applied in employment. Recognition of this transfer also allows us to identify transferable skills to other types of skills – the Department of Education's and Skills (DfES) define them as those skills that are central to the occupational competence in all sectors and at all levels (DfEE, 1997). Lewis (1997) states that 'as work is an important part of our life, we should find a place for it in schools and colleges' (Lewis, 1997,p.484), clearly endorsing the viewpoint that skills for the work place should be delivered in the vocational related course.

The essence of this has been captured in the Enhancing Student Employability Co-ordination Team (ESECT) definition of employability: *"a set of skills, knowledge and personal attributes that make an individual more likely to secure and to be successful in their chosen occupation(s) to the benefits of themselves, the workforce, the community and the economy*". (Yorke and Knight, 2006, p3)

Academic environments often do not recognise or value skills and according to Bridges, and label them as 'soft' options (Bridges, 1993). For many years we have seen skills competing

against academia as opposed to complimenting it (Drummond et al, 1998). Bennet (1999) comments that we have seen a 'disenfranchise' of skills of those technical expert skills related to their specific subject area (Bennet, 1999.) Employer expectations and shifts in Government policies have seen changes in approaches to thinking and acceptance of the transferable skills debate (De la Harpe and Radloff, 2000). While these references are a decade or more old, current thinking reflects a similar mind-set.

During the economic downturn in the 1980's, much attention was placed on 'skills' and ergo policy changes. Skills and competences became the subject of research and political debate. There was, and still is, distinction between vocationalism and skills, and during the 90's, authors such as Jessup (1990), Bates, (1997), Coffield and Williamson, (1997) and Unwin (2004a) subscribe to the concept that vocationalism was referring to the development of craft skills, technical or professional levels. Unwin further writes that the long term prejudice between vocational and academic education is evident in the nature of the language used by policy makers (Unwin 2004a, p.175). Coffield backed this viewpoint up noting that the colourful language used to describe vocational courses marked the content they contain (Coffield 1998, p.58). Training schemes, in their various guises, and vocational courses were set up to attract learners for 'skills training' for jobs that often did not exist but were attempts by the Government to 'up-skill' the unemployed. (Fuller and Unwin, 2001; Hyland, 2003; Parry, 2005; Unwin and Wellington, 2001) yet despite these many attempts to define 'skills', there lacks clarity and an ambiguity still exists.

This research will attempt to identify what skills the learners gained on their level 3 IT vocational courses and how they felt their job prospects were related to the development of those skills on their course. While there still remains much controversy over the term 'skill', this research will define the skills as those in the field of IT related to technical skills, both hardware and software that are directly transferrable to employment. Skills that could be taught and practiced in the learning environment and then taken straight into the workplace having contributed to successful employment. These 'skills' would not, in this instance include softer skills such as keyboard abilities, ability to communicate, work as part of a team etc, but instead seeks to answer whether the core skills within the field of IT have been delivered. These skills may incorporate programming, web design, hardware testing and maintenance, networking, graphics and digital animation, virtual networking for example. The

question of whether 16-19 learners have developed specific skills on the BTEC as well as some combination of the soft skills, is the point of the research and much debate. This then also questions the purpose, aims and composition of the BTEC qualification model. By not concentrating on the 'soft' skills, the research can eliminate discussion on the development of these skills from other sources such as part time work, Work related Learning (WRL), General Certificate of Secondary Education (GCSE) courses.

The Government places much importance on 'skills need' but rarely elaborates on the term 'skills or 'competence'. This research looks to identify if the delivery of the former has taken place but the evaluation of competence is not included, it is assumed that there is a level of competence as the learners will have been assessed on any skills learned. There is much literature on 'core skills' which is referred to as numeracy, literacy and ICT indicating that there is a universal agreement of these skills and their importance. In a report published by BIS titled 'Skills for Sustainable Growth' it was stated that there is a particular weakness in technical skills required to respond to technological change (BIS, 2010b, p.4). It is evident that there remains an ambiguity over what the term skills means to the various bodies.

IT / Computing skills

Computing

In 1991 the Computing Curricula model was devised by the ACM and IEEE society. This model covered nine core subject areas plus the topic of Social, Ethical and Professional Issues. Each subject area was then divided into a number of knowledge units as shown in table 1.

Table 1 – 1991 Computing Curricular Model

Subject Areas	Knowledge Units
Algorithms and Data Structures	Basic Data Structures; Abstract Data Types; Recursive Algorithms; Complexity Analysis; Complexity Classes; Sorting and Searching; Computability & Undecidability; Problem Solving Strategies; Parallel & Distributed Algorithms.
Architecture	Digital Logic; Digital Systems; Machine Level Representation of Data; Assembly-Level Machine Organisation; Memory System Organisation & Architecture; Interfacing & Communication; Alternative Architectures.
Artificial Intelligence and Robotics	History & Applications of AI; Problems, State Spaces & Search Strategies.
Database and Information Retrieval	Overview, Models & Applications of DB Systems; The Relational Data Model.
Human-Computer Communication	User Interfaces; Computer Graphics.
Numerical and Symbolic Computation	Number Representation, Errors and Portability; Iterative Approximation Methods.
Operating Systems	History, Evolution & Philosophy; Tasking & Processes; Process Coordination & Synchronisation; Scheduling & Dispatch; Physical & Virtual Memory Organisation; Device Management; File Systems & Naming; Security & Protection; Communications & Networking; Distributed & Real-Time Systems.
Programming Languages	History & Overview; Virtual Machines; Representation of Data Types; Sequence Control; Data Control, Sharing & Type Checking; Run-Time Storage Management; Finite State Automata & Regular Expressions; Context-Free Grammars & Pushdown Automata; Language Translation Systems; Programming Language Semantics; Programming Paradigms; Distributed & Parallel Programming Constructs.
Software Methodology and Engineering	Fundamental Problem-Solving Concepts; The Software Development Process; Software Requirements & Specifications; Software Design & Implementation; Verification & Validation.
Social, Ethical & Professional Issues	Historical & Social Context of Computing; Responsibilities of the Computing Professional; Risks & Liabilities.

Table 1 – 1991 Computing Curricular Model

According to Papert (1980) a method of learning general thinking skills is programming. Its use of cognitive thinking and Perkins and Soliman (1987) suggest that 'In general programming is a remarkably rich cognitive enterprise that might yield many different sorts of transfer effects (Perkins and Soliman, 1987, p.154). They further list some potential gains;

- Problem solving, problem finding and problem management strategies eg breaking a problem into parts or relating it to previously solved problem planning, and the kind of diagnostic thinking involved in debugging
- Abilities of formal reasoning and representation eg thinking of all the possible combinations and constructing mathematical models
- Cognitive styles eg precision and reflectivity over impulsivity
- Enthusiasms and tolerances eg persistence, enthusiasm for meaningful academic engagement

(Perkins and Soliman, 1987, p.154)

Other researchers however suggest that basic programming languages such as LOGO were unrealistic. Simon (1987) argues that its usefulness was 'technoromanticism'. Other authors however Underwood and Underwood (1990), Liao and Bright (1991) and Kirkwood (1998) concur that using programming was a 'mildly effective' approach to develop learners cognitive skills within a classroom setting. New languages and advancements in technology have seen the complexity and demand of programming increase tenfold, programming is now embedded in both academic and vocational technical level 3 qualifications.

The activity of designing multi-media products, such as a website can be complex and involve much higher thinking and many skills. Carvere, Lehrer, Connell and Ericksen (1992) list the major thinking skills required for multi-media designers.

- Project management skills & research skill
- Organisation and representation skills
- Presentation skills
- Reflection skills

However, a criticism of the model is that it could be argued that these skills could be equally developed through designing a poster display.

There has been much exploration into the use of IT or ICT within the teaching and learning environment but there is scarcely any evidence of research into the role of the *applied* technical IT skills required for progression to related employment, Reeves (1998) discusses many effects on the positive use of technology in education. Dawes (1997) argues that sitting a learner in front of a screen is not an effective learning method and that they should be taught the skills prior to the use of the IT.

IT is distinct from other educational technologies or platforms in that it is dynamic and multi-faceted. The formats are diverse and easily changeable, but these platforms as tools for construction of skills and knowledge, need to be defined and designed into the curriculum. A wide range of titles are used to describe the subject areas of ICT / IT or Computing; these can range from Information Technology, Technology literacy to Informatics and Computer Sciences, Computer studies or Computer Engineering Studies.

Genericism of IT skills

Bernstein's idea of genericism is a learning style which maps a generic skills set to learning in any domain (Berstein, 2000, p.53), perhaps a 'one size fits all' approach. Inspired by Bernstein's method of pedagogy Young (2011) discusses a model of 'powerful knowledge' but this can only be designed or delivered by subject specialists in their subject specific domain. The notion of genericism arises in the field of IT and the vocational course design in the shape of the students learning the ability to perform a task (in this case write an algorithm in a non-specific programming language – a generic skill) but without the specifics of a platform or language or data types and omitting how to carry that task out. A simple analogy might be that a student learns the components to make a Victoria sponge cake. However the amounts, preparation and cooking time along with what temperature, whether it is an electric or gas oven are unknown. These algorithms learned by the students can then be instantiated for specific cases, environments or tasks. A further example might be if the students have been taught to write the directions to college from home, using the constructs of English language and containing some dependencies such as; if the bus is there, board the bus otherwise walk. This is a standard labeling or sequential method underpinning all code that lacks data types and constraints but has common abstraction properties and different rules for implementation. This is generally known as polymorphism.

An example of genericism in IT may be web design. A course may be delivered at a very generic level – perhaps learning Hyper Text Mark-up Language (HTML) using notepad or notepad ++,simple software installed within the classroom. Learners may be able to write or design web pages or sites by manipulating the HTML for simple tasks such as page layout, headers, content organisation and formatting and page links. To use these skills on another platform or web page software, the learner would have to apply the generic skills or instantiate the skills learned from that course, on that software application onto a specific environment but would also have to discover any new commands, editing properties, tools and menu's within that new program. An alternative to this would be for a course to deliver content on a target software or platform which would skill the learner to design web pages in that particular software package. However, the skills learned would be pertinent only to that software and may be very different from another software package.

In these scenarios, the first course would be considered to be much more generic than the second, thus the learner from the first course may require more time or effort to master the skills of a designated package than a learner who had learned on that software. However, the second learner if confronted with a whole new software package may have to learn a whole new set of skills. Thus the first learner may be considered to be more adaptable than the second. Comparing these types of approaches to skills delivery and learning, it is evident that academic courses will be designed on a more generic level and vocational more concerned with specifics. Generic concepts may then only be included where the teacher feels it necessary for a base understanding of a concept.

In programming, the logical and generic design basics are taught in academic courses, focusing on the basic principles of programming referencing different languages. In a vocational course the focus is more on one particular language and platform even if the basics may be omitted. The language or software platform on a vocational course may be industry driven, the current or most popular languages used in industry such as C++ or Java whereas in academia, sequential or procedural concepts are taught using languages such as Pascal, Python, ADA., all less favourable in industry but relevant in learning.

Existing literature examines policy changes and also the debate on skills in vocational learning but there is a lack of research into the vocational technical IT field, specifically how it was shaped under the Coalition Government. Employability skills are very much in the news and of primary interest to both Government and Industry thus this research looks to address deficiencies in existing knowledge and offer an insight from the learners' perspective in the IT industry.

Chapter two - Methodology

Introduction

I undertook this research aware that my views and role as an FEC tutor on level 3 vocational courses might shape the research. As a result of this, I attempted to be as neutral as possible and reflexive in my approach and the way in which I investigated the phenomenon (Koch and Harrington, 1998). The methods I used, the findings that I considered most appropriate to the study and 'the framing of communication of conclusions' (Malterud, 2001, p. 483-484) were considered. Self-reflection of my own assumptions, beliefs and values was a continuing process throughout the research.

When conducting qualitative interviews I found the reflective process vital. My preconceptions and beliefs could impact on my research decisions, but the wording of the questions on both my on-line survey / questionnaire and my semi-structured interviews had to be designed in a way that did not influence the response I desired thus any bias removed. The interaction between interviewee and myself was reflected on so that any tendency to bias or steer the relationship during the process was addressed.

Much evidence researching and documentation on the validity of vocational education and pedagogy exists however there is a dearth of research that looks beyond the marketing and policy 'hype' of how the models delivered impact on young learners in terms of skills transfer and preparing them for related employment.

My belief was that vocational education was becoming diluted and moving more towards a 'generic or soft skills' delivery from a more 'core skills' model. The planned reforms in technical education advised by Lord Sainsbury (2016) aim to embed more technical content and practical skills that are recognised and indeed required by Industry (BIS, 2016). The methodology utilised in this research can be problematic when trying to prove an idea in terms of trying to capture the evidence. One limitation of this research is that the investigation and also analysis, is post-hoc. The transition from the traditional diploma level 3 vocational courses to the Level 3 BTEC Diplomas was considered successful by many of the stakeholders, such as FECs, Government and Exam Boards, however the basis for those conclusions are questionable. Grades achieved or achievement targets allowed progression

and employment uptake were mapped to success or achievement although this may not necessarily have been in related employment, and progression to HE may not have been on a related course as increasingly HE institutions will accept a credit UCAS point admission and not specify what pathway the learners needs to have studied. Success is measured by attendance, achievement and progression by FECs.

No structured interviews within the FECs at the time of the changes were undertaken to support the researchers view. Reflective opinion can be blurred through circumstantial change and an often distorted memory of studying years previously.

Research Methodology

One of the main aims of this research is to develop a deeper understanding of the perspectives of learners on the Level 3 IT Vocational pathway, the courses' skills content and how this affected employment opportunities for those learners. Assessing the two main types of research methods, qualitative and quantitative, I identified that in order to gather realistic data, a blend of the two methods in a small case study would be more appropriate. This blend will reflect the type of data that will be gathered in order to support the research aims. This chapter will describe how the research was designed and implemented and includes all variables, research instruments, sample selection, validity and reliability, data analysis and responses.

Research Methods employed

The research questions for this study are:

1. What was the Coalition Governments definition of 'vocational skills transfer' and did they deliver the mechanisms for it?

2. Have the impact of changes post Wolf (March 2011, *Review of Vocational Education*) under the Coalition devalued vocational delivery and status?

3. Do these courses fit into the framework of being 'strongly vocational' and what does that mean?

My questions were designed to explore vocational level 3 IT courses, or more specifically, Diplomas and what that meant in terms of trade or core skills transfer for learners across two FECs in the North of England. I was interested in learning how the newer formats of the Level 3 Diplomas supported young people in gaining related employment. I expected to see patterns emerging to define employability skills and the implications of delivery to those the learners.

Having established my research questions and the areas I wished to investigate, I then assessed the best model for collecting the data. Considerations for my research included the time frame. Working full time at an FEC some distance from my home and responsibilities at home meant ensuring that I allocated enough time to undertake the research thoroughly by effective planning. Recommended by Gough (2005) I divided up my research work into stages, and taking into account other factors such as social media platforms and the implicated costs and time for travel to East of the UK for interviews with FECB participants. Timeliness was, in part, less of a factor as I possess the skills set required for many of the surveys and initial platform of interest for students, both past and present. Designing my own on-line survey / questionnaire was a task taking no more than an afternoon and I hosted it on one of the survey providers' servers at no cost. The questions were designed so that responses could be elicited which would contribute to the questions of vocational rigour and skills delivery (see appendix 3) and ergo address the research questions in part. Using social media to entice students from both areas of the country was straight forward as I have been teaching technology for over 20 years and thus am more than familiar with social platforms used by young adult learners and how to contact learners via social media. Views from participants from one of the FEC's was not problematic as I utilised the relationships in my work place and for the participants and from the other FEC I used the contacts made in my former teaching role there.

The questions were designed to explore the skills content of level 3 IT vocational courses in two economically differently placed FECs. Within this I meant to identify what the term 'skills' meant for the learners. While my research is not testing some theory, it explores the interactions between skills delivered and learners, each having a different experience. Naturally theories defining employability skills and skills transfer would arise. The opinions or experiences of the contributing learners helped give a clearer understanding of whether the

learners felt there had been a skills delivery and what format that took and how far that contributed to related employment addressing research questions 1 and 3.

Qualitative research

The subject area of this research lends itself to a wide range of qualitative research methods and I considered all the measures. Controlled data gathered using quantitative methods can be used to draw conclusions about the strength and validity of the phenomenon. Gathering hard data and facts allows for singular conclusions to be drawn but as my research looks to consider how policy changes under the Coalition Government shaped the manner of the vocational level 3 IT experience in terms of skills transfer and implications for employment, and the experience if the learners on the pathway within 2010 – 2015, the most reliable source for experience can be garnered using qualitative methods. The research framework therefore for this research project cannot then be reliant on one method. Related successful employment relies on too many external factors to be considered a strong factor in the outcome of the course for the learners. Using the mixed method approach whereby the Quantitative research is dominant to the Qualitative by nature requires that the former is done before the latter and the approach will give a greater understanding of the differences between the cases.

According to Marshal and Rossman (1989) types of inquiry that qualitative research can be concentrated are;

1. Research that cannot be done experimentally for practical or ethical reasons
2. Research that delves in depth into complexities and processes
3. Research for which relevant variables have yet to be established
4. Research that seeks to explore where and why policy, folk wisdom and practice do not work
5. Research on un known societies and innovative systems
6. Research on informal and unstructured linkages and processes in organisations
7. Research on real as opposed to stated organisational goals.

(Marshall and Rossman, 1989, p.19)

Point one was impossible to complete as not only had the time passed that was being examined in the research, but the external variables were too many. The research aims to identify skills and their delivery on the level 3 vocational courses in IT and identify if those

skills are desirable or required in industry (point 2). At the time of both the research and the period of 2010-2015 the researcher was involved in the subject area in a professional capacity thus allowing access to some of the learners and adopting a participant observer role (point 2).

There has been much research undertaken into VET and 'skills transfer' but negligible specifically identifying the types of skill under the umbrella of IT. There has been an emergence of skills forecasting in the IT & Telecoms sector thus this research satisfies points 3 & 5.

As the research is not examining if any forecasts have been accurate over time, point 4 is irrelevant. Skills forecasting within the IT sector is a new concept and as such does not have a history that can be referenced. Point 6 is also irrelevant as it was not a consideration for the research. The research examines skills delivered on the level 3 IT courses and whether they fulfilled the expectancies of related employment for the learners.

In support of qualitative approaches, Gadamer (2013) argues that there is more to the truth than the scientific method and that the natural sciences do not provide the only method of rationality.

Quantative research

Much of the quantitative research investigation involved examining documentation relating to VET, policy documents from the Government and associated exam bodies and sector specific documents. The course materials were examined and data extracted in statistical format to help form an understanding of the phenomenon. These documents were secondary material as they were not developed specifically as a result of the research. Sarantakos (1998) identified that the choice of documents a researcher chooses will depend on '*availability, accessibility. Relevance and the personal interest of the researcher*' (Sarantakos, 1998,p.276). I identified much literature and documentation related to VET, FECs, skills shortages, Governmental policies and Educational Reforms, but on reflection some were discarded due to tenuous linkage to the scenario being researched or due to more updated material becoming available since the start of the research. Main resources included:

- Public sources: Government (and agencies), trade associations and public websites, exam board / awarding body documentation – quantitative data to be extracted from course materials
- Personal sources : notes made in researchers professional capacity and notes taken during interviews
- Administrative sources : progress reports from within the FECs and internal documents
- Academic sources : journal articles, books.

The data produced from the quantitative method for this research is in the form of words or images which are then interpreted by the researcher, they are not facts in the public domain waiting to be discovered. Further, Usher (1996) argues that the quantitative approach fails to provide understand of meaning within social interactions and state that:

> *...we need to understand the meanings that construct and are constructed by interactive human behaviour. Human action is given meaning by qualitative schemes or frameworks*
>
> (Usher, 1996, p.18-19)

Underwood (1997) However argue that quantitative methods can tell us if something has changed, but that in order to understand how or why the change took place, one needs to use qualitative methods. Elsewhere Scott and Usher agree that understanding social phenomena requires the use of qualitative techniques

> *Quantitative researchers are not able to deal with intentions, beliefs and propositional attitudes of social actors. If they try to, they are engaged in processes of reification, packaging and ultimately distortion. This suggests that data-collection processes which do not involve quantification will have to be employed to fully understand the nature of the social world.*
>
> (Scott and Usher,1999,p.92).

As the research strives to understand the views and experiences of the learners as well as identify to what extent the courses were 'strongly vocational', qualitative research is used. The perception of the learners in terms of their belief in any gained skills and the extent to which they practised them is not measurable by binary data.

Creswell discusses the mixed method approach commencing with quantative data and later using qualitative to provide reasoning for the former quantative (Cresswell 2005). This chapter defends the mix of qualitative and quantative and gives an overview of both methods.

Whilst the two methods are often seen as being opposed, the combination of them has become more popular during the last two decades and this research will combine the quantitative data and qualitative findings. Larkin et al (2014) point out that the choice of research model should be driven by the research question and not vice versa, and as the research questions seek to understand the vocational experience for the learners, the model is appropriate. Traditional methods for the collection of narrative and numerical data can be expanded and enhanced by the combination of the two methods, as discussed by Greene et al (2005). There are, however, many different approaches to the combination of the two methodologies and Punch discusses in his approach that there is no 'right way' of doing this. Punch also discusses the concept of triangulation of data, and other researches, Morse (2003) and Gorad and Taylor (2004) support the theory of combined research's effectiveness.

> *Combined methods of research, and the combination of data through different methods, has been identified by a variety of authorities as a key element in the improvement of social science, including education research. One of the key reasons advanced for this research claims are stronger when based on a variety of methods.*
>
> (Gorad with Taylor, 2004,p.7)

Efficient planning for each stage of the research will allow for each element (the survey, the secondary data document examination and the interviews) to be undertaken correctly and ensure that they add rigour and value to the research.

Case Studies

The research acknowledges that at the time of the evolvement of the BTEC's there was a down turn in employment, the economic climate was weak and the Government was making many fiscal changes.

The research questions were designed to address the lack of clarity of the exact type of skills transfer on IT provisions and related employment and fill the gap in research literature. As Denscombe suggests, the defining characteristic of a case study is its focus on individual instances rather than on a wide spectrum (Denscombe, 2007).

Hammersley and Gomm (2000) point out that case study research denotes a particular form of inquiry that differs from other forms of social research such as experiments or social surveys. Case study research often refers to a small sample of cases but often in more depth,

while my research will provide a snapshot of how the reforms manifested themselves in terms of student progression and pedagogy, the research does not allow for a full generalisation to be made. However qualitative researchers contend that generalisation is not the main aim of case studies (Bassey, 1999). The researcher may have a vested interest in a specific case, or may seek to provide illumination and illustration rather than….empirical generalisation (Stake 1995). This research aims to give a deeper understanding of an element of vocational provision at level three in one particular domain – IT.

The selection of candidates for open ended questions via interview was made from personal knowledge and via contacts at both the FEC's. The respondents are a mixture of students from various guises of level 3 vocational IT courses / qualifications both currently and historically. Thus, the selection of key respondents is purposive. The 'handpicking of candidates' for my intended purpose that would provide the most knowledge and understanding (Lewin, 2006, p219).

My research will attempt to describe how the changes were absorbed on the ground in terms of course format, skills transfer and models of delivery as per the perspective of students, both pre and post the policy changes. This approach was selected because it is appropriate for small-scale research (Blaxter et al 1996). My research covers both a phenomenon (the change in skills transfer and its related employment progression in IT) and the context (policies and funding changes for qualifications within FEC). Yin states that case study methods are most appropriate when collecting multiple sources of evidence (Yin 1993).While researchers such as Yin, Herriot and Firestone claim that the outcomes of case study research are looked on as being reliable, other authors such as Guba and Lincoln suggest that the data collection methods and the 'audit trail' of the whole process determine the reliability of the research outcomes (Guba and Lincoln, 1985, Yin, 2003, Herriott and Firestone 1983 in Yin 2003).) Using research subjects that span over a period of time will allow for a more confident conclusion. Using subjects from two different FECs for samples will allow for reliability across experimenters. Examination from policy documents and course descriptors from exam boards will ensure reliability and credibility.

The researcher was in-situ during the changes in policy and Government, the researched period. However data gathering did not happen in real time, rather retrospectively. The

impact of this research then seeks to allow for awareness and understanding as opposed to utilisation for impact. Content may then be used on an evaluation but not for a generalisation. Buxton (2011) raises the point that this type of research would be difficult to show the impact of due to its specialised area but backward tracking policy interventions can be assessed in terms of studying the behaviours and experiences.

Interviews

Kvale and Brinkman (2014) identify the aim of an interview is to exchange information from one party to the other and "*where knowledge is constructed in the inter-action between the interviewer and the interviewee*" (Kvale and Brinkman, 2014, p. 2) to allow the interviewer to "*understand themes of the lived daily world from the subjects' own perspectives*" (ibid,p. 24). Elsewhere Maccoby and Maccoby (1954) describe interviews as 'a face to face verbal interchange in which one person, the interviewer, attempts to elicit information or expressions of opinion or belief from another person or persons (Maccoby and Maccoby, 1954, p.499). Interviews may be structured to unstructured and standardised to casual. The more formal more suited to scenarios whereby there are a number of interviews and there are time constraints. The researcher opted for the unstructured approach, the small number of interviewee's was a consideration.

Sampling

Sampling decisions had to be made in order to make the research manageable and meaningful. Identifying the groups of participants was done at an early stage and according to Cohen et al (2011) the following had to be considered:

- The size of the sample
- How representative the sample group may be
- How easy it is to gain access to the sample
- The strategy and its appropriateness to the research being undertaken

Cohen et al (2011)

Sample Size

As I am not trying to prove a theory, more trying to understand the views of learners, I am interested in two groups of students, those from both the FECs. Cohen et al (2011) suggest that in qualitative research, emphasis was placed on the uniqueness of a set of participants or phenomena so it was more appropriate to talk in terms of groups or individuals rather than

a sample set. As my participants attended two different FECs, they will have different experiences of skills acquisition, this approach was more applicable for my study.

A manageable group of participants would be:

For on-line questionnaire

- 50 respondents from a mix from both FEC's – predominantly male, all who have taken a level 3 vocational IT course at either FEC since 2010 and their pathways. Age will range from 16 (for current learners) to 23 (which allows for 16yr olds who have taken a course starting in 2010)

Interviews - 3 from both FEC's

The number should allow for diversity in terms of years studied, course studied and skills acquired. The number should also allow for non-saturation but for all opinions and experiences to be included. Large enough to encompass all perceptions that are relevant but small enough so that repeated data does not become superfluous.

Sample sizes for case study guidelines vary and various researchers suggest different numbers. Charmaz (2006) suggests '25 participants are adequate for smaller projects', Charmaz (2006, p.114) Green and Throwood (2009) write that 'there is little new to be added '...(Green and Throwood 2009, p.120) after you have interviewed 20 or so people' and(Ritchie et al, 2003) states that qualitative samples often 'lie under 50' (Ritchie et al,2003, p.84)

Representativeness of sample set

Geographically the spread of participants is achievable as I work in one institute and used to work in the other and live equidistant to both. FECs A and B are quite different, City A in England's largest county and B in England's poorest. FECA was rated Outstanding in their OFSTED reports in 2013 and 2015 while FECB was rated Good in 2015 and Outstanding in 2013. In a recently published Teaching and Results Framework, FECA was awarded silver and FECB a bronze (Bungutay, TES, 2017). FECA in 2013/4 accommodated 3,642 16-18 yr old learners and FECB 4000. FECB offers courses in 15 subject areas from entry level to HE and also features a 14-16 college since 2013. FECB has a 66% proportion of students from areas identified as disadvantaged.

City A has slightly above employment rates both then and now, but lower in the rural areas, these areas can be a barrier for work. General qualification level across city A is level 3 with a

third of residents having achieved level 4. The city lacks large employers and replacing employability skills can be an issue as older skilled work forces retire, especially in manufacturing and engineering

(PMP Recruitment 2015)

Accessing the sample set

Using Social Media to contact potential participants has its own considerations. While social media platforms are a valid, increasingly used platform for sharing information, attracting only the desired respondents is difficult to do and there can be many associated problems using social media platforms such as twitter, Facebook, Google circles. Informed consent (see appendix 4) is a critical component of this research, the data sought was not accessible on general social platforms which could have been utilised without permission, and consent was to be acquired previous to the participants undertaking the survey. Aspects of participation such as the right to withdraw are more complicated in social media (British Psychological Association, 2013), for example is the participant aware of how to withdraw consent and do they know when this could happen? In this circumstance the researcher may be ethically bound in the ways in which they handle to data. Drawbacks from using Social Media are that only users already active on social media sites would know about the survey, monitoring all the responses and questions to posting of links to surveys can be time consuming, what the researcher can or cannot say may be governed by the institution of research. However, the positives are that a diverse group can be attracted to fill in the survey, anonymity allows for freedom to answer honestly, allow for involvement without face to face contact, speed and efficiency as a tool for contact. Using Survey Monkey to host my surveys I initially sought the consent and participation of a mix of current level 3 IT vocational students, aged 16-19. This was done by discussion as their tutor or agreement and discussion by my colleagues. One of the current learners was a member of forums that involved discussion with many communities in both cities and he added a thread in both local forums with an explanation and a link to the surveys. After the first few responses I decided to allow multiple attempts from the same IP address, as long as it was fixed (meaning belonging to either FEC) and monitored responses so that multiple attempts did not get included from the same dynamic IP address – indicating one person's phone or home network and many attempts from that device. The survey was live for approx 4 months and showed peak activity at the times that I

actively sought responses, by e-mail or word of mouth. Unless I was active in keeping the link active and having an on-line presence, the process went dormant. The internet is fast paced, changing information and links in real time and to keep your request for participants live or capture an audience you have to be prepared to invest the time and effort. My research was based on participation and the freedom of speech and movement. Jones (2009) writes '*Social media essentially is a category of online media where people are talking, participating, sharing, networking and bookmarking* online*. Most social media services encourage discussion, feedback, voting, comments and sharing of information from all interested parties*' (Jones 2009,) This research was concerned with the collection of data for analysis purposes and all data was not to be used for any other purpose. The on-line data consisted of binary answers collected that were generated via social media.

Researcher Bias

The validity of any research can be compromised by any recognised or subconscious bias by the researcher. Johnson (1997) suggests that this is so due to the exploratory nature of research, a move away from the structured quantitative approach. Views and perspectives of the researcher must not be allowed to influence the research in any way, examples of this may be guided questions or preformed ideas about candidates to interview. Pring (2003) identifies that '*the ways in which researchers engage in moral deliberations depends on the sort of person they are – the dispositions they have to act or respond in one way rather than another*' (Pring, 2003, p63). This suggests that any external influence will be interpreted differently by each individual.

Bourdieu states that a 'first automatic' inclination as a researcher is to try to escape 'any suspicion of prejudice' my attempting to 'negate ourselves as 'biased' or 'informed subjects' (Bourdieu, 1988,p.6). And indeed, initially this was my view. Over time however, I became skeptical about the belief that I could adopt a completely objective approach to my research, indeed that it was possible at all. My view then became interpretive, which was accepting of many different realities or truths (Pring 2000, Cohen et al 2000). I adopted the viewpoint that many different interpretations can co-exist on the same concept, and that my construction of what I believe to be true was one of many. In adopting this belief, from reading other research, familiarising myself with authorities on the subject area such as Bathmaker (2016), Coffield (2008) and Ainley and Allen (2012) and rejecting my previously held belief that my

viewpoint was absolute and therefore the one held by many, I was able to consider other perspectives much more openly and considerably. This openness allowed me to understand the policy makers meaning or viewpoint.

As the researcher, when I initially started my research, even further back, when the policy changes came into effect, I was very opposed to the changes. This opposition formed a very strong bias in my mind and I approached my research with my mind already made up about what I wanted the outcome to be but on researching further, going back into political history in terms of educational reform, identifying a timeline of policy changes, looking at economic slumps and growth and taking into consideration the social changes and aspirations of young learners, I found my bias ebbing away and my mind being opened up to new arguments and viewpoints. While I have an 'insider perspective' working within the field both pre and post the changes, in a white middle class FEC and a large old FEC in a very poor large city in the North, I felt that my experience was a good starting point. From the beginning of my research I tried to ensure that I maintained a degree of objectivity in all selection processes and creation of data gathering, whether it was questionnaires or interviews.

Validity and reliability

The researchers' skill and methodological approach determines the validity and reliability coupled with their integrity. Minichiello et al (1995) state that "there are three types of error which are said to make research invalid. A type one error is, believing a principle to be true when it is not. A type two error is rejecting a principle when it is true. A type three error is, asking the wrong question" (Minichiello et al, 1995, p.177).

Addressing the first of the errors, my bias might have affected my ability to interpret the results with an open mind, in order to be objective I removed the element of bias wherever possible by openly discussing any issues with professional colleagues who did not necessary support my viewpoint. The interview participants were instructed to answer the questions honestly even if they thought the answer might offend or upset the researcher having been most of their tutor. Learners may have felt some kind of loyalty to me as their tutor, to their course or to the College and it was important to try and encourage honesty. The third error, asking the wrong questions was avoided by providing the interviewees a list of questions to read beforehand, fill in if desired and then were invited to discuss the questions should there be any element of doubt. Each of the

participants was offered the opportunity to have a copy of the transcribed interview and two responded requesting copies but had no edits.

Data collection came in two methods, a survey then the interviews. In the surveys the participants were asked binary questions about their experience of the course, skills transfer and progression. The data was then analysed and any ambiguities rectified prior to the interview stage. The interviews allowed the researcher to answer any points raised by the participants at that time.

Education Research – Legal & Ethical issues

> *Being clear about the nature of the agreement you have entered into with your research subjects or contracts …Ethical research involves getting the informed consent …it involves reaching agreement about the issues of the data and how it its analysis will be reported and disseminated. And it is about keeping to such agreements when they have reached"*
>
> *(Blaxter et al, 1996, -p.146)*

The British Education Research association (BERA, 2004) underpin the issues raised by Blaxter (1996) and define guidelines for questionnaires and interviews in terms of guidelines conforming to ethical standards. An example would be ensuring all candidates interviews content and data remain confidential and only used in direct data analysis for the case of the research project.

Adhering to the Data Protection Act 1998, all data in all formats will be retained and recorded anonymously whether it is written, videoed, vocal recordings or survey results.

Informed Consent

All participants were given the assurance of confidentiality and anonymity. An informed consent form requiring a signature was given to each interviewee prior to the interview and for the questionnaire participants, an informed consent clause was on the web site which required permission prior to commencement of the questions. While Bell (2006) endorsed writing to participants prior to the interview outlining scope and nature of the research, mine were done in person at the start of the interview or on line.

All interviews were transcribed for an accurate record. These transcripts were available to the participants should they request them.

Limitations

Generalisations cannot be made from a small sample of learners from the researchers' place of work in FECA. Extending this sample to like-for-like FECs to test the hypothesis enhances the integrity of the sample for study. Hodkinson and James (2003) suggest that the researcher is part of the research but also could be considered an object of that research (Hodkinson and James,2003, p.298), this might sway the answers from participants - knowing some of the students used for data sampling may influence the responses. Established relationships may mean that students may answer any questions in a way to please me (as teacher) out of some sense of loyalty. Contrarily, the fact that an established relationship has occurred, may encourage the student to either respond at all and give more information in a more open and trusting way than if the process is with a stranger. Former knowledge of the students may make is easier to access more information and lead to further insights. It may mean the learners would discuss as opposed to just answer questions. Thus there may be social aspects within the questioning process and interpretation that may be affected however, it is important that I do not use my experience with any learners to affect the methodological approach I am taking.

> *Personal and social forms of subjectivity are always present in research….on this view it follows that there are no methodological criteria for guaranteeing the absolute accuracy of research quantitative or qualitative.*
>
> *(Coolican 1999,p.467)*

Knowing some of the interviewees first name and some details about them may allow for a more personal and "inevitable locatedness" (Barr 1998, p.5). This may help in contextualising my research.

Data Analysis

The initial responses and interviews assisted me in identifying which areas to focus on. As Cohen et al (2011) identify, the process of data analysis could cause conflict between the detail focused on and the ability to maintain a broader overview to identify themes and any conclusions (see Chapters 6 &7).

Summary

An easy way to report on the findings data might be learners ideas of skills are X, employment in related field was Y, this suggests Z. However, once all the data is collected and a comparison

of themes undertaken, it may be possible to identify that my findings concurred with academic research findings or educational policy documents, However, they may also indicate, as with my initial ideas, the opposite.

My findings hope to summarise;

- What the participants understand of the term employability skills
- How these skills were delivered on their course if at all
- How did this transfer of skills affect their chances of related employment?

Chapter 3 Definition & understanding of skills in IT

This chapter explores the 'skills' and what it means to different bodies. Terms such as competences, practical skills, transferable skills, employability skills and skills are often used interchangeably. This research hopes to provide insight into a specific field of vocational education by offering reasons why there is a deficit of IT core skills through primary and secondary data analysis.

Leitch (2006) defined skills as 'capabilities and expertise in a particular occupation or activity' Leitch (2006, p.6) – but then failed to identify and specific skills set . Eddington & Eddington (2010) support the notion that 'qualification levels alone a not a sufficient indicator of the value of skills to an economy (Eddington & Eddington,2010,p.2) and further go on to state that a VET framework 'must be closely integrated with sectorial and regional responses to changing economic conditions (ibid, p.1). Aiming to educate and train a supply of workers with the skills to respond to local or national employment markets is still at the forefront of the shape of VET.

Employability skills are often termed as 'soft skills', differentiated from 'hard or core skills' which are the specific skills or qualifications to relate to a particular job or role. Heckman and Kautz (2012) claim that these soft skills can predict success later in life and in part are responsible for that success (Heckman and Kautz, 2012,p.2). Soft skills are generally classified as personal skills, goals, motivation, attitudes and approaches to work. Many researchers and organisations over the years have sought to define these soft skills more precisely, the Department of Education who attribute these soft skills as *'character': ' a set of personal traits or dispositions that produce specific moral emotions, inform motivation and guide conduct*' (Taylor, J.(2017),p.4). *Character is increasingly recognised as being a required soft skill in employment along with personal resilience and emotional wellbeing* (APPG, 2012, p28). City and Guilds state that 21st century competences would probably be described as transferable skills rather than performance character skills' (City & Guilds, 2016, p.4). In 2015, CBI and Pearsons undertook research by surveys on education and skills of around 300 employers and reported that the three main factors employers looks for when recruiting were attitudes to work / character, general aptitude for work and basic numeracy and literacy over academic results (CBI/Pearson, 2014-2015).

Hancock in his 2013 report discusses skills and the design of the new Tech levels, this discussion is in direct opposition in terms of skills to the later CBI/Pearson 2015 references to skills in their report, Hancock states;

> *Tech levels will recognise rigorous and responsive technical education. High-quality rigorous vocational education is essential to future prosperity, and the life chances of millions. Because technical education is so important, it is vital the qualifications young people take are stretching, high-quality and support their aspirations. These reforms are unashamedly aspirational and will ensure tech levels help people into apprenticeships and jobs*
>
> *(Hancock, 2013)*

Hillage and Pollard (1998) define the term 'employability skills' as 'having the capability to gain, maintain and obtain new employment if necessary' Hillage and Pollard (1998, p.1) , Lees, (2002) and Knight and Yorke (2003) add that the demonstration of an acquired skills relevant to gaining employment and carrying out the job effectively (Knight & Yorke, 2003). The researchers also point out that learners cannot assume that they are employable just because they have passed a course successfully.

The model of the new Tech levels is more reflective of the older NCF vocational models which allowed for much practical work and skills transfer although its newest manifestation also embeds high level knowledge and assessment.

Identifying the perception of skills from the different stakeholders is essential as the term is used interchangeably by all parties. IT skills are often viewed as a generic term for describing the ability to use a computer. In the field of IT, this is not necessarily the case and core skills are differentiated from these soft IT skills according to the qualification type.

An analysis of the data commenced as soon as I started examining the course unit material. Interrogating the documentation allowed me to identify useful data in terms of skills delivery, assessment and unit design. The analysis used primary and secondary data – primary is the survey and interviews and secondary is the material from the exam boards. This data was collated by me for the research. The approach thematic, identifying themes which linked all sources (see Chapter 6 – Interview Data Analysis), this link is the evaluation of skills on the IT level 3 vocational provision as perceived by the learners and the analysis has been conducted with this in mind.

Core / hard skills or soft skills?

The IT industries definition of skills both in terms of software and hardware are often ambiguous, more so than other areas of industry, but both would be classified as 'core' skills. The findings in table 2 provide an overview of the software or programming skills required in industry.

Software not soft skills

Software is largely referred to as both the actual coding and the software engineering (design) processes that come before writing the actual code. There are industry standards for the engineering process which learners are required to learn and apply. These are standard models used in HE and industry.

Table 2 lists the most sought after programming language skills required in industry 2012 - 2014:

2015 Rank		Change	2014 Rank	Change	2013 Rank	Change	2012 Rank
1	Python	0	1	0	1	0	1
2	Java	0	2	0	2	0	2
3	C++	0	3	0	3	0	3
5	Ruby	-1	4	0	4	0	4
4	C#	2	6	2	8	1	9
7	C	0	7	-1	6	4	10
6	JavaScript	-1	5	2	7	-1	6
8	PHP	0	8	-3	5	0	5
9	Go	1	10	-1	9	-2	7
10	Perl	-1	9				
11	Haskell	0	11				
12	Scala	0	12	-1	11	0	11
13	Objective-C	0	13	-1	12	1	13
14	Bash	1	15				
15	Lua	1	16				
16	Clojure	-2	14	-4	10	-2	8
17	R*						
18	Tcl	-1	17	-4	13	-1	12
19	Visual Basic.NET*						

(Alexandro, 2015)

Table 3 shows the percentage change over the 2012/14 period in demand for the skills.

2015 Rank		2014	% Change	2013	% Change	2012	% Change	2011
1	Python	31.24	3.10%	30.30	8.47%	28.8	-2.38%	32
2	Java	19.58	-11.80%	22.20	-24.11%	25.8	-21.68%	25
3	C++	9.79	-24.69%	13.00	-22.30%	12.6	-18.42%	12
4	C#	7.37	47.40%	5.00	194.80%	2.5	1374.00%	.5
5	Ruby	7.11	-32.92%	10.60	-25.94%	9.6	-25.16%	9.5
6	JavaScript	6.48	24.62%	5.20	66.15%	3.9	62.00%	4
7	C	6.07	48.05%	04.10	23.88%	4.9	1114.00%	.5
8	PHP	3.62	9.70%	3.30	-50.41%	7.3	-54.75%	8
9	Go	2.26	50.67%	1.50	13.00%	2	-9.60%	2.5
10	Perl	1.52	-5.00%	1.60				
11	Haskell	1.51	25.83%	1.20				
12	Scala	1.27	27.00%	1.00	111.67%	.6	154.00%	.5
13	Objective-C	1.00	150.00%	0.40	900.00%	.1	999900.00%	0.0001
14	Bash	0.43	330.00%	0.10				
15	Lua	0.35	775.00%	0.04				
16	Clojure	0.15	-25.00%	0.20	-81.25%	.8	-85.00%	1
17	R*	0.14						
18	Tcl	0.07	133.33%	0.03	250.00%	.02	3400.00%	.002
19	Visual Basic.NET*	0.04						

(Alexandro, 2015)

We can garner from the tables that there has been little change in the programming languages sought by industry between 2012-2014. Of note, at that time, only FECB delivered one language which was in the top ten. In the studied years both FECs' taught C, VB6 / VB.net and HTML, despite their academic counterparts on A level Computer Science being taught Python and C# as per syllabus. It is evident from the data provided in the tables that there was little change in terms of programming languages used by Industry over the 2012/14 period yet only the A level in Computer Science responded to the changes and demands of industry and introduced a new more technical format for the Computer Science A Level for 2016 and prior to the new format the exams boards encouraged FEC's to teach a more relevant language which was evidenced in their acceptable language coded submission project work equating to 20% of the overall grade. The vocational courses did not change. Despite FECs' abilities to respond 'on the fly' to new changes and policy changes, the IT vocational courses had no updates in terms of content from the exam boards.

Networking and hardware skills

In industry, a recent article lists the necessary skills identified as those supporting the changing technical landscape:

Table 4 – Employment skills

Top IT jobs recruited	%		%
Programming application development	35	Web Development	26
Helpdesk / tech support	35	Database Administration	25
Security compliance / governance	26	Project Management	25
Cloud / SaaS	26	Big Data	25
Business Intelligence analytics	26	Mobile apps / device management	21

(Computerworld, 2017)

All of the skills in the table above are classified as software skills although there is some grey area around 'tech support', the label for a role that generally infers that the support may be from going through a script over the phone to a customer in order to ascertain the problem to physically fixing the hardware.

Further evidence that in the field of IT there is room for more ambiguity over the classification of skills. A recent post for a Network Engineers for the National Careers Service lists the entry requirements for a Network Engineers post as 'qualifications and experience in related areas like IT support, service and repair…' and lists skills required as:

- Strong IT skills
- Excellent problem-solving skills
- the ability to explain technical issues clearly
- Organisational skills

(National Careers Service, 2017).

While the first two bullet points might appear as soft skills, IT skills in a tech-support or networking role are hands-on repair / build / diagnostic / network skills which are very much 'core' skills, plus a sound technical knowledge. The latter two bullet points could be considered as 'soft skills' but not 'software skills'.

The term 'engineer' in IT can also be ambiguous. A network or computer engineer is one whose skills lie in practical / problem solving activities and hardware whereas a software

engineer is very much software / keyboard / specialist knowledge based. The notion of engineering with software is to be able to design and build a coded product for a customer or project from a PC.

Skills for Employability

In order to establish what skills an employee required, the employer must have a process for identifying the skills for any role. Central policy makers such as Department of Education (DfE) and Department for Business, Innovation and skills (BIS), SFA aim to prepare the workforce with the new skills required to meet the demands of new technologies and work place practices. Employers need a workforce that has the relevant skills to match their needs both immediately and the long term. In a CBI/Pearsons 2016 skills survey it is stated that the demand for skills was rising and that 69% of businesses were not confident that they could fill demand for high skilled vacancies (CBI/Pearson, 2016, p.6). This imbalance between the skills that current work force have against those required for industry may be, in part, attributed to the lack of definition and ambiguity over what those skills are. Skills for employability are inevitably referred to as soft skills but we can see from the evidence in this chapter that in terms of the IT Industry, skills can mean a different set of attributes and there is further ambiguity over soft skills and software.

Chapter Four - Models of delivery & assessment of vocational IT courses & the inclusion of skills transfer pre-2010/11

This chapter examines the models of the various Level 3 IT Vocational Diploma provisions across the two colleges between 2010 and 2015 under the Coalition Government. Their model of delivery and assessment are used to determine how much of each unit was 'core skills' content. This analysis allows for scrutiny of each qualification thus addressing research question 1 in terms of delivering the mechanisms for 'skills' transfer and also research question 3, whether the courses are perceived to be 'strongly vocational'.

Level 3 vocational IT delivery before and during the Coalition Government rule

As discussed in the literature review, funding for NQF courses was withdrawn when the Coalition Government took over. Instead, funding was introduced for QCF courses, 16-19yr olds only and for a qualification credit system which was easily transferrable to HE and other educational pathways. This chapter looks at the models of delivery of the various vocational Level 3 IT Diploma provisions across the two FECs and their models of delivery and assessment under the Coalition Government. The chapter expands on the content and delivery models identifying the assessment methods and transfer of core / hard skills versus soft or general skills. This analysis allows for identifying how many guided learning hours were allotted to each unit and their associated learning outcome and how many of the assessment methods were practical, whether that was building / fixing a computer or programming / writing code versus theoretical.

The Diploma - OCR Level 3 Principal Learning in IT

Tomlinson's Diploma which he claimed "allowed for progression into relevant higher level study to vocational sectors" (Tomlinson, 2004, p.25) was a move to enhance the perception of the vocational qualification and attempt to put it on a level with AS levels. However, this Diploma, developed under the 1997-2010 Labour Government, was entirely academic and non-sector based. According to Marston-Smith et al (2010) the Diploma included the development of 'soft skills' such as communication, problem solving, social skills and young peoples' attitudes to education. Hodgson and Spours suggest that The Diploma was yet another qualification in a line of failed qualifications such as GNVQ's, AVCE's and mimicked

its predecessor's weak characteristics such as complex assessment methods and 'academic drift' (2007, 2008). In recent contrast to the Diploma, the creation of a further vocational IT model commenced in September 2016, the 'Tech level', a new vocational qualification leading to recognised occupations (in engineering, IT, accounting or hospitality, for example) (Hancock, 2013).

The 2010 Diploma model consisted of 7 units, each a mixture of 60 and 90 Guided Learning Hours (GLH). All the units were theory based but the Technology Systems unit allowed for 5% skills transfer as assessment evidence – this means that the evidence for that criteria or learning outcome was one practical activity or applied skill. This 5% skills transfer consisted of teaching learners to build a computer system, install software and configure to meet the end users' needs and the learners were assessed on this activity as part of their overall unit assessment. All the other units were theoretically assessed or required an exam, both internal and externally assessed. The units consisted of;

- The potential of technology
- Exploring Organisations
- Effective Communication
- Skills for Innovation
- Technology systems
- Multimedia
- Managing Projects

(Boardworks, 2008)

While this format may have been designed to rival the A levels in terms of theoretical content and allow for progression to HE, it certainly did not provide the opportunity for vocational core skills transfer of related industry in terms of practical skills within the Industry. As previously discussed these could comprise of programming languages, web design, hardware skills, networking, animation, video production, virtual platforms. Designed to bridge the gap between academic and vocational qualifications, its nearly 100% theory delivery meant it had more on common with the traditional ICT A Level, focusing on how to use applications and work on a computer.

City & Guilds Advanced Diploma in ICT and Systems Support (pre 2010)

City and Guilds previous manifestation of the IT Diplomas were entirely different models. Designed to train and assess practical skills with a small related amount of knowledge / theory assessed, the funding strategy allowed the unemployed learners to up-skill and re-skill ages 16-64. City and Guilds is a brand entrenched in vocational history and recognised in Industry. The qualification framework allowed for multiple retakes if a unit is not passed by a student therefore success rates in terms of achievement were always very high.

The C&G model rolled out at FECA was one core unit and 4 optional. Of this model, 3 pathways were available: 1 core and 4 optional C&G practical units, all assessed by activity. I core and 2 optional (Practical) and 2 Microsoft Professional qualifying the learner as MCDST – Microsoft Certified Desk Top Support Technician and finally the 3rd option, 1 core and four Professional qualifying the learner as MCSA – Microsoft Certified Systems Administrator.

Table 5 City & Guilds pathways

C& G strand	**MCDST**	**MCSA**
502 Customer Support Provision	502 Customer Support Provision	502 - Customer Support Provision
503 – Installing hardware and software	505 – Testing ICT systems	70-270 – Installing, Configuring and Administering Windows XP Professional
504 - Installing and upgrading systems	510 – Maintain ICT Equipment and Systems	70-290 – managing and Maintaining a Windows Server 2003 Environment
505 – Testing ICT systems	511 – Implement an ICT systems security policy	70-291 – Implementing, Managing and Maintaining a Windows Server 2003 Network Infrastructure
511 – Implement an ICT systems security policy	70-271 Supporting Users and Troubleshooting Microsoft XP Operating Systems	70-293 – Planning and Maintaining a Microsoft Server 2003 Network Infrastructure

	70-272 Supporting users and Troubleshooting Desktop Applications on Microsoft XP Operating systems	

This was a hardware engineer course that skilled the learners and qualified them to do a specific job. The professional elements of the course to take privately would cost in excess of £2000. Naturally, the course was full every year as the C&G course was funded by the Government at that time.

I-Pro (pre 2011) NQF

The Oxford and Cambridge Exam board (OCR) also offered the I-Pro qualification. This was a level 3 Diploma which allowed for strong skills transfer and development. The model was delivered as one core unit and 6 optional. Two of the optional units were professional units which contributed to the Cisco CCNA qualification. All 6 of the optional units were designed for maximum skills transfer and practise with practical assessments. Each unit awarded of 75GLH. The OCR units comprised of practical assessment and theory. The practical assessments criteria required an extensive knowledge through understanding through practised elements, such as configuring a router interface in a complex coding language.

The qualification aimed to:

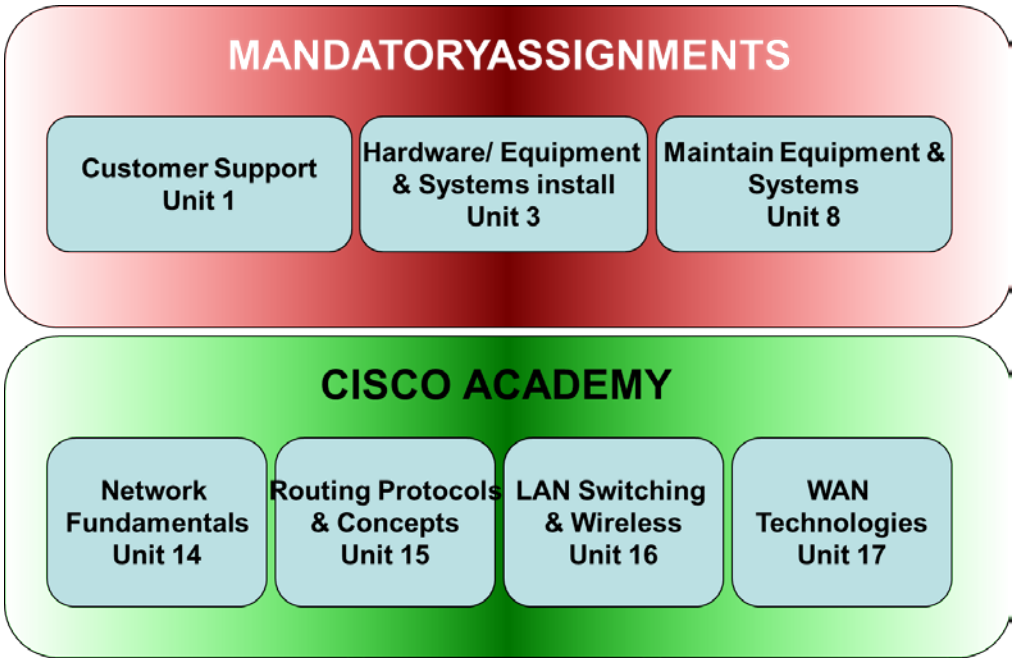
- develop understanding of the ICT industry and its environment
- develop understanding of the process of software creation from the point of investigation of customer requirements through to the testing of the completed product
- develop practical skills in creating and testing software
- develop the skills needed to manage an ICT system and network
- develop practical skills in installation, maintenance and testing of ICT systems
- develop generic, non-technical skills that will support personal effectiveness in the workplace
- encourage progression by assisting in the development of skills and knowledge which learners will need to undertake further study
- provide candidates with the knowledge, expertise and practical skills for the IT workplace.

- develop candidates broad understanding of the issues and importance surrounding customer support procedures and its symbiotic relationship for IT Professionals
- develop the professional competence of candidates for the maintenance, management, support and development of systems or databases/web and server applications

(*OCR Centre Handbook, 2006 p.6*)

It is evident that this qualification and model have a clear emphasis on developing trade skills in the associated field of employment and stress this development of skills in terms of practical as opposed to theoretical assessment.

Fig 2 – I-Pro Delivery model



BTEC (Extended) National Diploma in IT 2010 – 2016

The format discussed examines the model delivered from 2010-2016. The Extended Diploma model consisted of 9 units per year, 3 core on two of its pathways and 9 core on Networking & Systems Support. A one year 90 credit Diploma was offered to some on a one year pathway or the Extended Diploma of 180 credits over two years. The three pathways were IT, Software Development and Networking & Systems Support. All of these pathways are the basis of this study. Each unit is awarded 10 GLH thus offering learners a 90 credit or 180 credit Diploma. It is interesting that in their 2011 Course Specification Guide, Pearson Edexcel state;

> *These BTEC qualifications are designed to provide much of the underpinning knowledge and understanding for the National Occupational Standards (NOS), as well as developing practical skills in preparation for work and possible achievement of NVQs. NOS form the basis of National Vocational Qualifications (NVQs).* ***The qualifications in this specification do not purport to deliver occupational competence in the sector, which should be demonstrated in a work context***
>
> *(Course Specification Guide,2011.p.2)*

This suggests that the course formats are not planned or shaped to allow for the delivery of core or practical skills to a competent level. Further, it is evident from identifying the assessment criteria and content models that developing such 'practical skills' was not a great emphasis in the design of the units and allowed for a very small percentage of the practical or core skills assessment type.

The BTEC qualifications in the 2011 specification have been developed in the IT sector to:

- give education and training for IT employees
- give IT employees opportunities to achieve a nationally recognised level 3 vocationally-specific qualification
- give full-time learners the opportunity to enter employment in the IT sector or to progress to vocational qualifications such as the Edexcel BTEC Higher Nationals in Computing and Systems Development
- ***give learners the opportunity to develop a range of skills and techniques, personal skills and attributes essential for successful performance in working life.***

(Course Specification Guide ,2011.p.5)

The above two quotes are in direct contradiction of each other within the same published documentation, in one hand the exam board claim to meet National Occupational Standards (NOS), giving learners the skills and knowledge for work, yet they also claim that they do not claim to deliver the means for occupational competence within the sector. This chapter examines the tension between skills (or practical competences) and assessment types in order to support the statement '*….give learners the opportunity to develop a range of skills and techniques, personal skills and attributes essentials for successful performance in working life*.' The Learning outcomes (LO's) Pearsons' claim '*state exactly what a learner should know, understand or be able to do as a result of completing the unit*' (ibid, p.47). This research suggests that the delivery models allowed for very little scope for development of core practical skills and even less opportunity to practise them.

Table 6 presents statistics on the assessment methods used in the BTEC programme of the Level 3 Extended Diploma in IT, in its three pathways; General IT, Software Development and Networking & System Support. It is very clear that from the statistics that there is little scope for practical assessment, the exception being Networking & System support, and even then at the tutors discretion. Both FEC's had a hardware lab within the IT divisions (dedicated classrooms with servers and machines / systems built in for student and teaching use). At both FECs these labs were staffed by one main tutor who worked from that one room. At both FECs the tutors had open door policies so that any learner could come in on non-timetabled sessions, lab availability permitting, and practise skills and learn new ones.

Assessment methods / evidence types

The key to my secondary data analysis was to apply my knowledge of each course and its delivery models to help extract and identify data which would support the answering of my research questions. Creswell identifies that the research methods consist of how the researcher collects, analyses and interprets the data (Creswell, 2009). My research began with what was already known about a topic and what remains to be learned (Cresswell, 2009), thus utilising material that already existed supported my approach. I examined each unit of each course and identified structure, content and methods for each and tabulated this – see appendix 1. This was a fairly lengthy process but being familiar with the delivery model of many units meant that I was able to extract the data reasonably easily. I had the benefit of being part of an informal network – the exam boards, both FEC's, current and former learners thus access to data or answers to any queries was not too problematic.

EdExcel Pearson's BTEC (Extended) Diploma in IT identify 644 verbs (types of assessment method) for assessment (see appendix 1) in the two year course for all three pathways. However, Including the Networking and System Support, which one might assume would be extensively assessed via practical activity, a mere 23% of all assessment methods are practical, or involve a practical task being assessed. Over the two year program, non-practical, or rather soft skill assessed methods number 495, a total of 77%. Of these staggering 147 use 'explain' as an assessment method – see table 6.

Table 6 – Learning assessment outcomes

	LO's	Assessed via practical/ core skill	% core of whole unit	Theory assessed LO's	*Explain*	*% explain*
SDD	216	40	18	176	48	27
NTWK	194	62	32	132	50	37
IT	234	47	20	187	49	26

SDD – Software Development & Design
NTWK – Networking and Systems Support
IT – Information Technology

The 'verbs' as type of assessment methods were identified by examining each exam board assessment paperwork for every unit for each pathway (see appendix 1). All learning outcomes and assessment methods were identified and those which were practical by design or directly related to the practice of core skills were labelled as 'verbs'. Where there was a lack of clarity, the program leader for that unit was contacted for further clarification and detail. As the above table identifies, while the networking strand has the most amount of core skills assessed via practical activity, or trade skills taught / supported in activities, it also has 'explain' as a theory method assessment the most frequently. What is surprising is that on the SDD pathway, the opportunity to learn or practise or even be assessed on programming abilities (which is in fact the reason that the majority of learners select the pathway according to researchers experience in over a decade delivering vocational Level 3 pathways), only 40% of the assessment methods are practical on a course that directly relates to programming or applying programming methods which are considered core skills. The pathway 'Software Design and Development' suggests that the learners will study software design methods and skills. This strand is particularly popular due to the sheer number of young learners who are avid gamers and have dreams of becoming games programmers.

Each unit on the BTEC is awarded 10 GLH so over the two years that equates to 180 GLH. On the Networking course over 18 units contain 194 LO assessment methods / practicals, which equates to 0.93hrs per learning assessment type. This 93hrs must also include all the delivery for the learner in class time and practise or implement practical skills / program plus any time for assessment marking and feedback. This equates to 56 minutes for each learning outcome

assessment method including its delivery within each unit. While the learners may have had a somewhat limited opportunity on timetable to learn or become aware of a concept; a programming language, a wiring construction standard or a network configuration, the opportunity to practise these skills was not catered for adequately in the model. While many core programming skills can be practised outside of the classroom the hardware skills cannot as no student has the equipment to enable this.

The next two chapters give an account for the two data collection phases for the research, accordingly the chapters are divided; results of the survey; discussions from the interviews and finally the findings from the interviews.

Chapter Five - Learners experiences and views

Data Collection method - The Survey results

The previous chapters have highlighted the issues of identifying and delivering transferrable or core skills within the level 3 vocational frameworks in IT and the interpretation of those skills. This chapter is used to present the results of the student surveys across two colleges in the North East and relate them to the overarching research questions; RQ2) Have the impact of changes post Wolf under the Coalition devalued vocational delivery and status? And RQ3) Do these IT courses fit into the framework of being strongly vocational and what does that mean?

After my literature review which included many opinions from various researchers I was clearer about the types of questions that I wanted to ask in my survey. As my research was concerned with the skills development in various level 3 courses in IT and the experiences of the students, I was less guided by previous research which tended to be a wider approach to VET, Educational Policy and Skills definition.

Overall the survey was designed to ascertain the perception & understanding of the skills delivery and relevance for the learners along with related aspirations for progression The survey was designed to investigate whether learners felt they had gained more general / soft skills (communication skills, organisation, basic IT skills etc) and was based on;

- Which type of level 3 IT course they studied on

- Their understanding of the skills learned
- The opportunity for any skills learned to be practised within the framework & class
- Whether the adoption of any skills contributed to securing a related employment
- Whether the skills merely attributed to the confidence of the learner in applying for employment
- Recommendation for the course.
- Skills recognition by learners
- Success association with skills for learners

The questions were binary and by utilising Survey Monkey on line (see appendix 2), all students could have access and responses were kept anonymous. The surveys were accessible via the internet thus the respondees were able to use their smart phones to complete them.

The main phase of the research, the survey, was focused on Level 3 Vocational pathways in IT and its formats. The initial investigation began with the survey which elicited 106 students from Further Education College A (FECA). This survey explored the views and experiences of the level 3 learners on their IT course and their perception of skills gained. College B (FECB) elicited 35 responses thus 141 responses in total. The data was collected from students on level 3 IT courses (those being delivered under Coalition Government 2010-2015) in different guises and pathways and included from FECA; General IT, Software Design & Development, Networking and System Support and from FECB ;The Diploma, I-Pro, BTEC and 'other' (for those who were unsure of the title). The surveys were hosted on Survey Monkey (see appendix X)and the link distributed internal and externally using social media sites (see appendix 3)such as Facebook, Reddit and local information forums for both areas (see appendix 4). The Student Union at FECB was also contacted and hosted a link to the survey inviting learners fitting the criteria to take part in the survey.

Identification of external influences for participants was important. The duration of time since their course may lead to a changed view of their experience, the relevance of the survey for learners outside of the researchers FEC workplace. The uptake of related employment is also a factor as if any learner was unable to find work due to the economy, the course may have been unfairly blamed for the lack of employment. The element of bias had to be considered as the researcher taught at both College's and the participants may well have been taught by her, thus this may affect the way that the questions were answered.

The Responses were as follows for each course:

FECA

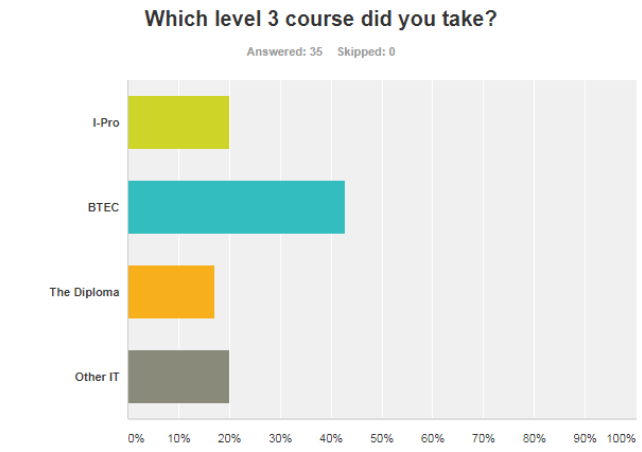
General IT	13
SDD	61
Networking	32
Total	106

FECB

The Diploma	6
Other	7
I-Pro	7
BTEC	15
Total	35

Combined total = 141

Figure 3 – responses to course



Answer Choices	Responses	
I-Pro	20.00%	7
BTEC	42.86%	15
The Diploma	17.14%	6
Other IT	20.00%	7

The first survey question for all groups was whether the learners felt that they acquired more general / soft skills as opposed to core or specialist skills. The learners were able to make the distinction having been on their course for a minimum of 6 months and were familiar with the format and content of their chosen pathway. Each student handbook listed the units for each year and the learners by this point, were well practised in report writing / presentation software writing submissions for assessment. Removing the Networking strand from this scenario (due to it being a more practical course model), 75% of the groups stated that this was the case, they felt that they were delivered or learned more generic soft skills that core e.g programming practise, multi-media creation. For the Networking strand, only 28% agreed that they learned more soft than core skills. It is evident that a clear distinction was made between the models for hardware versus software and this division was at the Exam board / funding level as opposed to the facilitator's level. This then supports the notion that the vocational IT courses were not in fact 'strongly vocational' and that it could be considered

that there was a distinct divide in what the exam board considered as core skills, they being a significant difference in the learning assessment types and GLH.

The split means that ¾ of the learners on the software pathways since 2010 did not feel that they learned the skills they required. While the survey did not allow for open ended questions, having taught at both FECs' on all the pathways examined, I was very aware that the desirable skills were programming, web development, video editing, robot control, game design. The Networking pathway is excluded from percentage counts in places as its delivery model is unlike the other pathways, it contains 9 core mandatory units, most of which are practical. While the Networking path learner's perspectives are important in the research, some of the questions differed slightly to the other pathways and some of the reported statistics are recorded separately.

While 74% responders stated that they did not have the opportunity to practise ALL skills (Programming languages, media skills, games design, animation), the Networking strands pathway was the only one with 81% agreeing that they DID learn ALL the skills and practise them. The term 'ALL' used as the software pathways encompassed units on Software Design, programming, control units, game maker, video creation, video editing, animation and graphics. This 74% percentage is a direct reflection of the GLH and learning outcomes awarded for each unit. Of the other pathways, 78% of learners did not feel that they were taught the full range of software skills / programming languages or given the opportunity to practise them.

We can also consider that the languages taught within the different pathways were limited and not the most desirable for industry (See table 1) Visual Basic6 (VB, VB.net) HTML (Hyper Text Mark-up Language) and variations of C (C++ or C#) were the languages delivered by both FECs' during the researched years. C++ only taught in the latter two years of the period, previously VB6 and then VB.net. As previously stated, other than the recent embedment of C++ / C#, none of the languages taught were sought or desirable in Industry (see table 1). We can assume that the learners had little perception of industry requirements in programming language skills but that getting taught two languages and getting the opportunity to practise them in class at times was how they measured their satisfaction, otherwise we should expect to see a different figure reported in terms of dissatisfaction. Only 26% of learners agreed that

they were allotted class time to practise either software or specialist skills (excluding networking) which is a reflection on the class time organisation as opposed to how many languages they learned.

67% of learners agreed that having learned skills, it gave them the confidence to apply for related employment. The perception of confidence may be a reflection on the implicit value of the course for the learners; social aspect, high achievement grades, college environment. It may be that they applied for related employment but the survey did not factor in whether their applications were successful, this was outside of the scope of the survey. It might be that the world-view held by many was limited and thus felt that the course qualified them for the employment sought. 45% of learners felt that their learned skills or experience had a positive effect on their employment prospectives. Again, this 'positive effect' might be a reflection on learners who achieved well, finished their course and got a good reference and not on specific skills learned. Further research would allow for further clarification.

Of the one cohort that was asked, 31% claimed that there were skills required on a related employment role which were not delivered on their course (skills such as programming languages, app development or fibre termination) adversely, only 23% of learners from FECB agreed that their course contributed to employment in a related role. This may be a reflection of local employment opportunities or personal attitudes towards a set of circumstances may have influenced their answers. Only 14% of learners agreed that they had applied for a related job that their course had directly qualified them for. Again, this may be a reflection of local and regional employment figures. Of note, this is not a figure which can be considered of use in research as the majority of the learners on the BTEC pathways progress on to HE. Further research might include a comparison of progression routes for BTEC IT learners and perhaps triangulate that with local employment opportunities at that time.

I was aware from the results of the survey about the misinterpretation of questions. The participants perception of 'skills' may differ from the type of skills that the question was referring to. Thus, the same question was worded in a different way to discover if it elicited the same response. An example of this is Q2 and Q3 which should elicit the same response but are worded in a different way.

The survey data

Table 7 – Survey Results

Question	**SD**		**IT**		**NW**		**FCB**	
	Y	N	Y	N	Y	N	Y	N
Did you gain more general (report writing, databasing, WP) or specialist skills (Programming languages Animation, graphics, video editing HW, networking, configurations)	46	15	11	2	7	25	25	10
How many programming languages did you learn? How many specialist skills did you learn?	34 – 1 25 – 2 2 - 3		3 – 1 1 – 2 3 – 3 6 – 5+					
Did you get the opportunity to practise your programming skills on the course? Specialist skills / trade / industry skills?	47	14	8	5	26	6	23	12
Do you feel you got the opportunity to learn and practise ALL of the skills – full range of languages?	28	33	10	3	24	8	20	15
Have you applied for a job that your course has qualified you for?	7	54	2	10	6	2	26	
Did your course directly contribute to related employment?	21	46	4	8	9	23	15	20
Were any of the programming skills that you learned on the required for any role you applied for? Specialist skills?	23	28	5	6	15	17	16	19
Do you feel that having learned the programming skills for an industry role that this has made you more confident in applying?	33	26	8	4	27	5	27	8
Were the job skills on a role that your course did not equip you with?					10	22		
Did your skills have a positive effect on your employment prospects?							16	19
Did your course contribute to success in a related work role?							8	27
Would you recommend the course to anyone else thinking of talking a vocational course it IT?	44	17	7	6	26	6	12	23

SD = Software Design & Development, NW = Networking & System Support, IT = General IT
FECB – Pathways : I-Pro, BTEC, The Diploma, Other

Significance testing on data

In the survey data the researcher was interested in investigating whether a course delivered more generic or soft skills than core skills as per question 1. Thus identifying if one side of the issue would receive more responses than the other and the statistical test investigates whether there are significantly more 'yes' than 'no' responses. I used the z-test for the difference between two proportions.

$$z = \frac{p - \pi}{\sqrt{\pi(1-\pi)/n}}$$

In the formula, *p* is the proportion of the sample choosing one of the options (75), in this case 'yes', π is the null hypothesis value (the proportion expected if there is no difference between yes and no – so 50% or 0.50) and *n* is the sample size (109)

Our survey received 109 responses and with the exception of the Networking pathway (32 responses) , 75% (or .82 as a proportion) of those stated that they learned more generic skills than core skills. If the responses were split evenly, 50% would be expected to select 'yes' or 'no' evenly. Thus the null hypothesis in this case, of the respondents would be (π) of .50

We subtract p-π or .75 -.25 = .5 next we subtract π from 1 = .5 which then is multiplied by π so .5 x .5 = .25. We then divide this total by the number of responses 109 giving 0.002293 and finally get the square root of this figure which results as 5.319.

$$z = 75 - \frac{\frac{.25}{.5(1-.5)/109}}{109.25} square\ route = 5.319$$

With the Z-test, the critical value is always 1.96 for two-tailed significance regardless of sample size. Because the computed value of 5.319 exceeds this cut-off value, we can state that there is significance difference between the proportion of learners that stated they learned more general skills than core skills.

While the number of responses was not huge, the data analysis is of great value in determining meaningful results, allowing for the separation of factors. The nature of the experiences of the learners and their views on their courses required some level of quantification and allowed for a degree of confidence.

The survey was issued to FECB, although the response level was much smaller than FECA due to the direct relationship with both staff and learners equating to higher accessibility to learners at FECA. In addition to the surveys an interview was undertaken with six students, all of which have been on a level 3 IT related vocational course at FECs' A & B before or in the early period of the Coalition. These participants were contacted via personal e-mail and 3rd party request. These participants consisted of those on their level 3 IT course in or before 2010 at the time of Coalition Government, and some the period of between 2010 and 2012, just prior to their course removed from funding.. The findings of the interviews will be discussed in the next chapter.

Chapter Six - The Findings (interviews)

Having collected a number of survey responses from both FECs which was quantitative, I then supplemented this with qualitative data in the form of interviews. These interviews were semi-structured and allowed for open ended questions plus informal talk. The aim of these interviews was to gain a more in-depth exploration of the views and experiences of the learners. The participants were contacted via e-mail or social networking platform.

The semi-structured interviews with former students were simple to conduct, record, transcribe and analyse. All interviews took place in a pub and also a coffee shop and in one of these occasions, three learners attended, this was requested to save time for them and also so that transport could be shared. The participants also were keen to meet for a catch up. Recording the interviews and transcribing was a simple process, Cohen et al. (2011) suggests that transcribing direct speech not only provides an accurate record of the interview but also provides additional data in terms of the language chosen by the interviewee. While this process was occurring I had to maintain my objectively but there is a possibility that this approach may have led to a more subjective and less objective view of the data.

In total I interviewed six participants, 5 male and one female. There was (and still is) a very small percentage of females on the IT related courses. I chose three former students from FECA (which included the female) and three from FECB. The former were the three who elected to have their interviews at a pub over soft drinks at the same time. All participants were given a consent form and a copy of the questions (see appendix 5 & 6) at the start of the session. None of the participants were reticent as all were known to the researcher. Again, an awareness of intent to please was recognised, learners who had been taught by the researcher and had a positive experience might be more likely to respond in a way that pleased the researcher.

Interview Data Analysis

Analysing interviews can be a complex process but was undertaken as I transcribed the interviews. Initial themes were identified which created focus for the researcher (see appendices 8 & 9). In this chapter I will include evidence from the interviews and organise them firstly by themes with supporting quotes. A simple version of coding was undertaken which consisted of grouping the participants responses into categories that allowed me to group ideas, concepts within the themes. I had considered the method as used by Wellington (2010) whereby the information is broken into small chunks and then linked to each research question. He claims that whilst you can identify themes, you can observe irregularities as these are as important as similarities (Wellington, 2000I considered the approach endorsed by Miles and Huberman (1994) whereby data reduction takes place, summarising themes and sorting into categories. The next stage was to draw conclusions from the data and tabulate this or put into a graph followed by the third stage, the interpretation of the data giving it its meaning. As my qualitative data consists of only 6 interviews a more thematic approach was adopted.

The interviews were carried out with a total of 6 learners, 3 from FECA and 3 from FECB. All 6 of them were face to face and responses were recorded via a digital voice recorder and then transcribed by me. The first three interviews took place in City A where FECA was located and the same for FECB, using candidates from before the 2010 changes and early years of Coalition Government, the 2010 – 2015 period. The number of initial interviewees was small and participant's names were replaced with PA1, PA2, PA3, PB1, PB2 and B3, thus ensuring their anonymity.

All six participants were in employment, mostly in a discipline related to the field of their qualification (s). All of the participants were known to the researcher but not necessarily taught by me. The notion of bias was challenging for me and attempts were made to avoid this by focusing on their experiences and views and presenting them with a list of questions that were in the survey prior to discussion (see appendices 4 & 5) so that they knew the area of focus and also were less anxious. These interviews generated data to add to the research.

Coding

After transcribing the interviews I was able to identify themes by coding the dialogue (see appendix 6), I used two sets of codes, A priori set (preceding set of ideas) and then emergent codes, those that follow or emerge post analysis of the data (Strauss and Carlin 1997). From this thematic analysis I was able to sketch or diagrammatically represent my ideas which aided for a more intensive analysis. (see appendices 7 & 8)

The major themes identified in the interviews were that the format of the vocational course the participants were on provided ample opportunity to learn and develop new core skills and this I could identify three main themes:

1. opportunity to learn and practise practical or core skills within unit
2. learning outside of the unit / practise
3. related progression opportunities

Theme 1 – opportunity to learn and practise practical or core skills

This is the first theme identified in the interviews. Students overall have expressed that their expectations were met and this impacted positively on their recollections and experiences and too, on their progress. They highlighted that the teaching was very good and were all given extra opportunities for learning and practise. The nature of the delivery of the courses was Expansive (Fuller & Unwin, 2003).The delivery models allowed for modelling work place practise and used actual mistakes, errors and real world problems as models for learning within its units. While this model may be restrictive in terms of the breadth of work place scenarios, learners developed strategies to overcome real world problems. This model allowed for a reflective approach from the learners. All of the participants regarded their experience of learning related skills positively.

PA1 was keen to link their skills practice opportunities to related employment and in particular their experience could be mapped to the Expansive model of delivery;

> *Yeah, I could not have applied for the job I did if I hadn't done the course. I needed to know the stuff I had learned for the job, and looking back, I am glad things went wrong as often as they did – we had only broken PC's or problems to fix, not computers that are working fine. What was that phrase you told us PICNIC? (problem in chair not in computer – yeah that was it) it's true.*

The inference from their response was that the ability to respond to issues and apply fixes increased their confidence and self-belief when applying for related employment.

PA3 made a particular reference the style of delivery on his course (C&G). Learners spent the majority of their time practising core skills:

> *The course was almost all practical, we worked on machines for the majority of lessons and quite often we learned more when something went wrong, it was just a further opportunity to practise*
>
> *Some lessons we had some instruction or theory to learn before we could do the practical but we didn't spend any whole day or lesson doing theory.*

PA1 echoed this and commented;

> *Apart from the customer skills unit which had some writing to do, all the units were doing stuff, I loved coming in, the days went so quickly.*

PA1 also responded when question on the core skills learned versus the generic skills;

> *Nah not really – [you] had to teach us some bits and pieces about professional documentation but most of the course was doing stuff and fixing stuff, if we couldn't explain it to you, we didn't know it – that's what you used to say.*

PB2, having studied at FECB was also very positive about the amount of class time spent undertaking practical activities:

> *Because our course was Cisco, we had to do all the exercises [on machines] in the lab. Mostly we could work at our own pace as long as we practised enough to sit the exams at the same time. We could take it again if we failed which made us feel less pressurised.*

This supports the Expansive lesson structure as previously discussed and it was apparent that all the participants gained not only confidence but also valuable skills outside of the course model.

PA3 went on to state:

I liked it, I got to work at my own pace, always had help and learned so much. Some things were quite hard but after a while I got the jist of it all. I am quite proud to be a female fixing PC's and messing about with networks.

PA3was reflective of her experience and related back his experience compared to that of her friends on other pathways at that time.

The teacher didn't like powerpoints but sometimes we had them as it was the best way to get across some learning, but it only really made sense once we applied it and practised it.

We were encouraged to go beyond the module limits, out tutor really wanted us to learn the skills of the trade to improve our chances at getting a job.

For me, it was a confidence thing. I was clueless at the start but by the end could do a lot of the activities blind fold. I got the chance to learn loads and loads of stuff.

On his (PB1 recollection of his experience compared to those of his friends also at FECA but on a BTEC IT course):

[they were]taught to pass a BTEC not do the job

My mates on the IT course were bored stupid and regretted taking that course, I think I learned loads more than them

They gave them a bit of code to copy off the board to get something to work, [he] had no idea what it meant or how it worked, just that he needed it for their assignment. It was rubbish.

From the analysis of the GLH for each unit on the BTEC the above experience is one echoed over the years. Tight deadlines for delivery and assessment, mixed ability classes and pressure on the tutors and managers for achievement are all culpable.

PB2 went on to discuss opportunities for skills practise at FECB

We got loads of hands-on but the equipment was really old so even though we set up physical networks and stuff, they were not very fast or powerful so we were quite limited in terms of how far we could go. [She] managed to get some faster PC's donated from a school in City B which were better and she gave sole responsibility to us for finding out about them and looking after them for the year, they got battered!

PB2's comments highlight the difficulties of trying to deliver up-to-the-minute skills with dated technologies or equipment. Lack of funding equates to lack of higher spec machines.

His experiences also shows that the learners were given much opportunity to practise and stretch but were, in this instance, compounded by the facilities

Theme 2 – learning outside of the unit / practise

Both FECs had a hardware lab, these labs contained specialist equipment for all of the general IT hardware units but also more specifically for the professional units in the courses at each FEC. Because the nature of the courses and number of learners each year dictated the provision of the facilities and tutoring, both FECs' had one designated member of staff who worked predominantly in each lab. Unlike other tutors who went from room to room, group to group, the lab tutors tended to be placed in their labs all day due to work load and time scales and accessibility of teaching tools. This then meant that there was always a tutor in the labs at all times and thus meant that learners could have access to the hardware and also the tutors when possible. Both FEC hardware tutors adopted an open-door policy. It may be interpreted that students were encouraged to come in outside of timetabled lessons to assist in the configuration of the hardware /machines. Once any group had finished their lessons, the hardware was more often than not in a non-working state making it very difficult for the tutor to fix them all ready for next class use. A system was adopted whereby once the learners had demonstrated a good level of understanding and skills, they could use the labs outside of lesson time, learn extra skills and theory but also assist in supporting the hardware for the tutor and classes. This gave the learners invaluable experience, not only in skills development and diversity of problems to solve, but also instilled a level of responsibility in the learners, strong communication skills and built their confidence immensely. The learners were also then permitted to add this extra skill set and experience to their CV's making them potentially more employable.

PB2 stated that much of the practise and applied knowledge was at the tutors' discretion

> *The Cisco lab was always open so even when we weren't supposed to be in there as long as [he] was in there, we could go in and practise. He was really good at explaining stuff and we had lots of opportunities to get it right and to pass.*

PB3 concurred with view in that he found the extra time the most beneficial;

> *To be perfectly honest, the undoubted benefit of being on that particular course was the access to resources that were not available to most. I have no*

doubt that the extra learning was at the discretion of the tutor and he appeared to be very enthusiastic about this stretching of the students. No wrote learning but real life solutions to real life problems. Invaluable experience.

These views on extra learning opportunities at FECB plus hands on experience affirm the opinion that they were a vital part of the learners' positive experience. Activities outside of the curriculum seem to have a huge impact on the learners at both FECs.

PA3 also commented on the open door policy at FECA

I think because she teaches all her lessons from that lab, she is in there all the time so we could go in as long as we weren't interfering with any classes had. To be honest, in our second year we often helped in class with the first years, it was helpful to us and them. They always asked questions about the course and what they were going to learn in year two.

PA3, when asked about opportunities to stretch and practise recalled a positive experience and frames his recollection in terms of confidence gained;

Because I didn't have anything else to do as I was on the dole and we weren't in 5 days a week, I would go in on the days that [she] ran the level 2 and sort of became her assistant. It was great experience and having to fix stuff and answer questions to new students meant that I had to really know what I was doing. I put this on my CV and reckon it helped me find work.

[you] had this great policy of stretching us, we did what we needed to do, what was needed for the assessment and then you would introduce us to much more exciting and complex stuff, because it wasn't in the course we would have missed out but all the virtual stuff I learned was really relevant to my job so I am always thankful.

Highlighting the positive relationship with their tutor PB2 stated;

We would deliberately look on the internet to find things we thought he was going to argue about, like only 10 connected PC's in a work group. We would ask, he would tell us why we or the source was wrong then he used to make us demonstrate the scenario to prove the point. It was great being able to argue the point having proved it. None of this was on the syllabus but we loved it.

This comment draws attention to the level of engagement of the learner. It is evident that the learners considered their class a safe environment to debate and investigate ideas or phenomena's;

A lot of it for me was being able to make mistakes and it be ok. Nobody laughs at you, we all made mistakes but we remembered stuff more if we got it wrong then had to find the fix. Because we were a small group most of us had different stuff that we were the best at. I was really good at scripting, [you] taught us this even though it wasn't part of the course but its been so useful and because we all were better at one thing than others, we made a good team.

The approachability of the tutor is obvious plus the comradely within the group no doubt increased the intrinsic value for the learners and also their later recollections of their time on the course.

Theme 3 -related progression opportunities

During the Coalition seat, 2010-2015, unemployment was high. Both cities are in the North East and city B had more unemployed claiming benefits than any other city in the UK, rising to 6.9% by 2015 (NOMIS, 2017). Opportunities for related employment were scarce and competition fierce.

PB1 stated that his level 3 course allowed him to progress and was aware of limited employment in the city at that time.

My level 3 was really good and it inspired me to go on to do the foundation degree. There was no chance of getting a decent job without a degree – especially in this city.

This view is supported by the thoughts of researchers such as Ainley & Allen (2012); Hesketh & Brown (2004) and Wolf (2011) who endorsed the idea that a degree was a minimum requirement for employment.

In contrast, PA2 stated when asked about employment prospectives after his course:

….I learnt loads, got two qualifications instead of one and it started my career off. I am now 3rd line support for the council and have my own specialist area.

PB1 went on to state that before he started his level 3 course, he never thought that he was academic so for him, being the first to University in his family, it was a great achievement.

To be honest, there wasn't any work around, I hated school and wasn't sure I wanted to go to college but it was that or nothing so I went. I started to do well pretty soon and loved the course. OK, the equipment was old and sometimes that limited us a bit but we were left to get on with it if we wanted

to practise on our own, it was great. I was worried at the time about what I was going to do next, there were no jobs and I didn't want to leave home then. The Foundation degree was suggested so I went for it, best thing I ever did. I would not have done that if I had not enjoyed the level 3 course as such or if I hadn't done so well. I went from not knowing what I wanted to do when I left school to having a clear idea and going for it. I work in IT now, I am always learning but wouldn't have had either the skills or the confidence to apply for my role if it wasn't for my courses.

PB1's experience in terms of self-belief and academic confidence are clearly evident, from starting as a reluctant learner to a sense of purpose and direction.

PA2 openly discussed his employment after his course and directly relates his role to his learning experience and environment, describing his experience he recalled;

God yeah – even when I started at my job it was front line support and we had to ask scripted questions, it made them feel better (and me actually ha ha) because I knew what I was talking about, and them most of the time. The Desktop Support stuff was really helpful and I think that on my CV is what swayed it. There were not that many jobs about especially for college leavers. I was really lucky to get in but I had more to offer I guess. They obviously like me 'cos I am still there!

PA2 took the C&G pathway with embedded Microsoft Desktop Support Units. He, along with other level 3 learners applied for a 1st line support role with their local council. The role entailed answering calls on a tech support basis. The standout factors which would have enabled him to secure the role was his level 3 with the Microsoft professional units. He discussed this openly in the interview.

PA2

Yeah like I said, I learnt loads, got two qualifications instead of one (referring to his C&G and MCDST Microsoft qualification) and it started my career off. I am now 3rd line support for the council and have my own specialist area.

Further endorsement for the level 3 encompassing professional units and qualifications was PB2;

Having a Cisco qualification put me ahead of others that just did a Diploma. I know it was only the entry one [Cisco cert] but it looked good on my CV.

PB2 was on the IPro course at FECB. He took the embedded CISCO professional units to qualify him as CCNA, Cisco Certified Network Administrator.

I couldn't find any work after I finished my course, there just weren't any jobs about. I borrowed the money off my mum and took more Cisco qualifications privately. It wasn't cheap but I figured it was the only way I was going to get a good job. Eventually, after temping, I got a job in a large organisation that have European offices. I help run the Network now but there was no way I would have stood a chance without the CCNA and CCNP. The course was my springboard and gave me the confidence to try for the higher level Cisco qual.

PB2 understood that in order to place himself in a favourable position in a lean employment market, he needed to make his profile as competitive as possible. He attributes his employment success to his level 3 course as the springboard for this.

PA3 also related his experience on his Level 3 course to his employability, not just because of the core skills practised but in the opportunity to communicate with others outside of his peer group and understand their needs;

Helping the first years [students] helped us really, we helped out on new student days and open days, I think that improved my confidence and gave me the idea of being able to work with customers and not be worried about it. We were allowed to put the extra stuff on our CV's and it meant we had something different or better to offer a job.

PA3 from FECA recalled that he took the level 3 C&G Diploma having successfully completed his Level 2. He saw the course advertised and despite being on the dole and having no prior experience in the field other than his Level 2 qualification, he was accepted at college:

I had no hardware experience before I went on the courses. I did my level 2 then my level 3. We spent so much time fixing problems that by the end of it I was fixing all my friends and families PC's and got some part time work as a hardware tech support. That did me a favour as there weren't a lot of jobs around the area in IT so after a couple of years I was able to find a full time job as a more senior support where I went from site to site. If it hadn't been for my course, there is no way I would have been able to do the job I do now. I was a painter and decorator.

The funding was cut for these courses and the interviewees were with the last cohorts to take the level 3 qualification in this former format. 19+ learners either had to pay for a less hands on course at level 3 or pay for an Access course to get into HE.

Ch 7 Interpretation and addressing the research questions

RQ1) What was the Coalition Governments definition of vocational (IT) skills transfer and did they deliver the mechanisms for it?

This research is concerned with the field of IT and in particular, its level 3 vocational provision. We have seen from evidence in the literature review that there I still much confusion as to what defines skills. There is much evidence regarding the views of the previous Government on skills at that time, but not a precise definition. In its 2012 Skills Review, *Learning to grow* the CBI claimed that 71% of employers would like to see schools and colleges prioritising the teaching of employability skills. They defined these as:

- A positive attitude
- Self-management
- Team working
- Business and Customer awareness
- Problem solving
- Communication and literacy
- Application of numeracy
- Application of IT

(CBI, 2012. P.32)

In direct contrast to this the CBI later concluded in its Education Report *First steps: a new approach for our schools*, that employability skills were not easily defined but a combined knowledge that is developed over a child's school career (p32). The CBI report discusses young people gaining a range of skills in their syllabus subjects but still failed to define exactly what skills are. In their more recent report *The Right Combination*, 2016, CBI / Pearson detail yet more discussion on skills and the skills shortage currently, with Pearson president, Bristow, stating;

> *By far the most important 'skills' factor centers on attitudes and aptitudes such as ability to present well. The majority of employers have concerns in these areas, whereas less than a quarter worry about formal qualifications. These soft skills have hard outcomes. Some say it is not the role of schools to provide these skills. So whose role is it? And to what extent should we shape our qualifications to reflect these skills? (p5)*

There is much discussion on the skills shortage, changing technologies and labour market demands rising the skills level (p12) but at no point are these skills documented to be anything other than in their previous Skills Survey of 2012. What is evident is a lack of definition and how the skills mis-match is going to be solved.

This research evidence suggest that the nature and focus of skills required for industry by the Government and exam boards were more centred on soft skills. The format of vocational education, specifically IT at level 3 was a reflection of this approach. The most common of vocational Diplomas, the BTEC, allowed a mere 23% GLH for practical assessment across all of its IT pathways. Previous models of Level 3 IT vocational delivery models allowed for a more generous and fitting assessment method and were more focussed on the delivery and development of core skills for IT career pathways (over 80% of GLH) and a clear focus on practical assessment methods and outcomes.

The Coalition Government was committed to widening participation in to HE, this move saw a change of learner profiles into HE via the vocational route. From 1995 to 2011 there was a dramatic rise in learners taking Level 3 vocational courses to entry, from 93,800 to 278,200 – a 197% increase (DfE 2011b). Despite this growth in vocational learners, the majority accepted to lower tariff universities as identified by Hoelscher (2008) and UCAS (2013). Despite stating the vocational qualification policy changes should "*Fund only the highest quality qualifications valued by employers*" and "*Ensure that qualifications and Apprenticeships (and the standards on which they are based) are relevant, rigorous and recognised as having value by business and learners*," (BIS,p.6) It is clear that this was not the case with the IT provision.

Evidence suggests that employers were still not being consulted despite recommendations from research such as The Wolf Report (2012) for this to be put in place. In a paper published in 2014 by the BIS, they state "*We* should *work with employers to encourage the development of career pathways*"(p.14) which is a clear indication that this was still not the case and the paper further identified;

> *Employers, alongside learners, are meant to be the customers of the system but in practice it is complex and difficult for them to understand, with little effective ownership from businesses, young people or adults. It has delivered*

> *too many qualifications which have little impact on learners' work or progression prospects. The system has also relied on qualifications as an indication of both competence and progression, when it is not clear whether current qualifications are capable of doing either job effectively.(BIS, 2014.p14)*

Having conducted a literature review I found much discussion on skills, termed as employability skills, key skills, soft skills, core skills and general skills but found little in the way of definitions for these terms. What is evident is that the format for the IT level 3 vocational delivery 2010 - 2015 certainly allowed for the development and practice of soft skills but lacked opportunity for transfer and practise (and at times assessment) on what learners perceived to - be core or practical skills.

In terms of learners experiences, 75% of survey responders claimed that they learned more general or soft skills than trade or core skills. Question 2 of the survey asked how many programming languages the students learned, 55% stated one language, 40% claiming two. There is room for misinterpretation here as some learners will consider HTML as a coding language and some will not hence the disparity. However if we look at these two totals, combined with the 75% claiming they had more soft skill transfer and the overall responses from the interviews which are in direct contrast to the surveys and were pre-Coalition, we can make a safe conclusion that the way the models were designed and delivered, there was not a provision for vocational skills transfer of core or trade skills.

RQ2) Has the impact of the changes post Wolf (2012) under the Coalition devalued vocational delivery and status?

Professor Wolf suggested around 350,000 16-19 year olds were working towards vocational qualifications which were of limited value to them and not recognised by employers (BIS 2014, p14). Despite radically reducing the number of vocational qualifications, the quality of vocational education in terms of progression was still an ongoing area of concern for the Coalition Government. The perception of quality of vocational education has been discussed by Ainley & Allen (2010); Brown and Hesketh (2004) and Wolf (2011) who purport that a degree was the minimum requirement for employment.

There was an agreement from all of the interviewees that they had sufficient opportunities to practise and develop their core skills whilst on their course. If we compare that to the % of

learners who have been on the BTEC or like since that time there is a big difference in the experience of the learners on the different course model.

Question 9 on the survey asked the learners if there were skills on a job role that the course did not equip them with, of the hardware co-hort 68% stated no, there were not, but only 41% of the other pathway learners said no, equating to 59% agreeing that they were not taught the skills for their job. We can see an emerging pattern, not only between the vocational courses pre-QCF but also a distinction in the perception of skills on the hardware profile to the software of the later courses. While programming is a very competitive field to gain entry into, the overwhelming consensus from the survey was that the learners did not perceive their course to have skills or vocational value with 75% claiming to have learned more soft skills and a further 74% claiming they did not get the opportunity to practised any skills learned. A necessity when applying for a software role (computer programming role) is evidencing your ability to design and write code (programming languages). Did the BTEC pathways give the opportunity for this to happen? According to the learners, no. According to the course specification, no.

If we were to consider the views of the learners as a measure for the impact of the changes, a resolute yes would be the view on whether the courses were devalued. The survey responses clearly indicate that the learners did not feel that they were given the opportunity to learn and to practise new skills or indeed, to have a broader range of core skills delivered. Of all the pathways excluding the Hardware on, only 41% of learners agreed that they would recommend the course to others, however on the more practical hardware course 81% claimed that they would recommend the course. Obviously other factors have to be taken into consideration when asking learners about their experience on a course. The social aspect, the holistic nature of the college experience, the relationships with peers and tutors and to some extent, loyalty to the course. It is worth noting that there is a big discrepancy of views between the hardware course learners and the software path learners. The views of the learners are their perception on the status of their course.

A conclusion may be made that the courses did not match the learners' expectations and this may have swayed their experiences and responses. Information and Guidance is crucial for these learners prior to starting the course in order to manage those expectations. If the

learners were initially better informed about the specific content and assessment methods they could make a more informed choice. With competition between FECs and 6th forms at an all-time high, it is more likely that courses are portrayed in a more positive light than discussed in detail. There is a distinct difference in learner experience for those learners on the older pre-2011 NQF courses and those on the 2010-2015 QCF BTEC Diplomas, the former being much more positive and upbeat about their experience.

RQ3 - Do these IT courses fit into the framework of being strongly vocational and what does that mean?

The survey asked 'Have you applied for a job that your course qualified you for?' elicited a response of 29% of respondents confirming that they had. On reflection this question was not representative of those applying for work for many reasons; they may be progressing to HE thus not looking for work; they may only be looking for part time work to support further learning, there may have been no job opportunities available. Further research might include a comparison to the progression of level 3 learners in order to establish a truer figure.

One of the questions addressed their perceived skills learned and applicability to employment. 34% of respondents agreed to this question, although the previous question garnered only 29% it may be possible that the learners misconstrued or misunderstood he question. They were being asked if the skills learned contributed to related employment not just employment which could have taken any shape. It may also be that they gained part time work and found that some of the skills learned on their course could relate directly in some way to their job or it may be that even though they could not relate the skills specifically, the completion of the course successfully was a determining factor for any employment. Again, further research would allow for a deeper investigation. This is interesting as in question 8, 67% believed that their course made them more confident when applying for work so half of that amount whilst gaining confidence did not attribute this to the course.

Question 8 produced much more positive responses 'Do you feel that having learned the [programming, hardware etc.] skills for an industry role that this has made you more confident in applying?. 67% agreed that they were more confident in applying for work. This question did not include the word 'related' so it can be interpreted that a more general

confidence level was achieved in terms of what the learners had to offer prospective employers despite in the earlier part of the question it discusses the core skills. If we compare this figure to the 75% of those who claimed to have acquired more general as opposed to core skills on their course, it would seem that while these learners did not feel they learned enough core skills or had the opportunity to practise them, the overall effect of the course was the confidence to apply for work, despite lacking the core skills. This may be a reflection on opportunities for employment, about the numbers of young adults who secure part-time employment whilst studying.

We might surmise that their course could fit into the category of being 'strongly vocational' if we took the response percentage for question 8 in isolation. In fact, what we are seeing is that having completed the course, there appeared to be an increase of confidence for the learners and that had a large part to play in seeking or procuring work. This does not support the viewpoint that the course had great vocational skills transfer or validity.

According to recent Government response to a skills paper examining the skills gap in digital skills,

> *In September 2014, we launched the new computing curriculum with a greater emphasis on the computational thinking skills needed by all young people to support the future digital economy…*
>
> *(Digital skills crisis: Government Response to the Committee's Second Report of Session 2016-17,2017, p.2)*

And further state that

> *"The Government has consistently sought the views of industry experts, specialists and leading organisations in the digital and tech sector to help shape action on digital skills, and we will continue to do this*".

These points are a direct contradiction to those raised in this research where it is evident that a lack of collaboration with employers with exam boards has resulted in few valuable skills being delivered within the technical & IT field. It is no wonder then that in 2016 yet another manifestation of the BTEC Diplomas (known as Technical Diplomas) are being introduced which include strong emphasis on programming and hardware skills transfer and have been developed and designed by the exam board, the FECs and industry.

In 2014, there were 1.4 million jobs in the digital sector and research from the Tech Partnership predicts that by 2023 the economy will require one million new people to fill digital roles. The rise in digital roles and vacancies across the labour market has opened significant doors for retraining opportunities, and has raised the importance of developing effective digital skills through the curriculum, education system, workforce and later life. The new Tech levels appear to seek to address this skills shortage, however, this is a cyclic press VET at FECs have been through many times.

Conclusion

The nature and scope of the research was limited to quite a small group of participants. All had experienced some form of level 3 vocational Diploma IT course. It is acknowledged that the opinions of participants might not be a true reflection of the course model but coupled with evidence in the literature review and document analysis, their views constitute significant information that might be considered meaningful and noteworthy. Where possible during the analysis process, quotes and survey results have been examined for supporting data.

The purpose of vocational education is to prepare the learner for HE or work (traditionally the latter). Courses should provide the opportunity for learners to receive training that allows them to perform a particular task to a pre-agreed level of proficiency, as opposed to explaining or discussing it. Currently the VET courses produce learners who can contribute with a number of soft skills allowing them for flexibility in any role in any general workplace. However, the design and delivery of the courses should emphasis skills required for employment needs in particular roles or trades.

Evaluating the transfer of ‘core’ skills was the main theme of the research thus analysis has been undertaken with this in mind to be cohesive with the research aims. The survey results were presented in table form. The interview responses were examined for common themes and supporting views.

The research questions that this work aimed to address provided findings that for the most part echoed other research in the field, the definition of skills, skills transfer and the skills

course models was still undefined and therefore not provisioned for adequately.. It is clear that students were given plenty of opportunity to practised generic or soft skills (communication skills, general IT skills, problem-solving, basic business skills, teamwork) but it is evident that more emphasis needs to be made on these soft skills importance to manage expectations.

This research shows that the learners' post-NCF change did not believe they were given the opportunity to learn or practise non generic skills. We can consider then that they were not give 'real-world' problems to learn from but that the pre-QCF learners received exactly that. We could argue that part of real world problems might be problem solving, deadlines and time management but stronger linkages need to be made between that and the classroom experience for the learners.

This research revealed there was an interesting unexpected distinction between the software pathways and the hardware path. This distinction is clearly made by the Exam board upwards. It is noteworthy that the academic qualification counterparts had changed format (to more relevant and technical content) and include embracing strong elements of coding / programming to respond to the technologically changing landscape.

One of the aims of the research was to find out if the learners felt that the skills delivered were of any value in terms of a requirement for related employment and whether the courses fit in to the strongly vocational category, according to the learners and what that meant for them. The majority of the learners were dissatisfied with the number or core skills delivered and developed. This argument is the highlight of this research and while existing research examines the definition of skills, widening participation, general model of vocational Diplomas, the data from this study indicate that that there was insufficient scope for core skills development within the IT field.

The hardware course learners at FECA surveyed stated that they learned more hardware / core skills than any other strand, including those taught previously at FECB. Overall of a response of 141, 63% of responders' stated they learned more soft or generic skills. However if we remove the FECA hardware / networking course out of this cohort it equates to 109 learners and a staggering 82% of responders' stating they learned or got delivered more generic soft skills than specialist ones. Does this equate to 'strongly vocational'? Not

according to the learners. Can we then conclude that the BTEC model is not truly vocational in its truest sense?

All of the six learners' interviewed strongly agreed that their education transformed their lives. Waller in Bathmaker and Harnet (2010) discusses the impact of educational success and how advantages are passed onto our children' (p.57) and that this 'further illustrates educations power to transform the lives of individuals, families and wider communities' (ibid). The creation of jobs and the ability to earn certainly are seen as transformations but this research has highlighted that perhaps another transformation is the increased self-confidence and self-belief.

The findings of this survey suggest that more needs to be done at policy level so that skills transfer can be structured into the learning outcomes and assessment measures. It was clear that the learners felt that they had been delivered more generic skills than specialist / core and while these soft skills are important for development it seems that the learners could not relate these to employment. The survey learners were clear that they did not feel there was enough opportunity to transfer or practise related core skills on their course.

The sample is too small to be statistically significant so a generalisation cannot be made for all Level 3 Vocational courses, however, the most recent model and its' content are reflective of the current BTEC qualification in IT. What is significant is that since the start of this research, the advent of the new Tech levels has ensued. The format of the new tech level course(s) in IT and its units are a significant move from the format of the BTEC 2010-2015. There is much emphasis on core skills; programming languages are heavily featured, multi-media skills such as animation, web design, app design, video creation and editing are embedded as well as the hardware and networking skills. The content reflects the changes in the technological landscape so units on 'The Internet of Things', 'cloud computing', 'virtual networking', 'computer forensics' and 'social media in Business'. Traditionally in Further Education, policy changes that affect course changes are barely given enough time to roll out, evolve and assess before a new set of policies are introduced.

In the recent CBI/Pearsons skills survey, much rhetoric is contained about 'skills shortage' and 'higher skills level' yet there is no definitive suggestion as to what these skills are. From 2016 the DfE criteria for inclusion of vocational qualifications into 16-19 performance tables will

see a new approach to the (BTEC) courses. External stakeholders from HE, employers and professional bodies were all consulted regarding the design of the new shape of BTECs. In their paper Plan for Growth the Coalition state ‘ we have to become more productive so we can be a leading high tech, highly skilled economy’. (2013)

Tech levels are level 3 (advanced) qualifications for students wishing to specialise in a technical occupation or occupational group. They are recognised by a relevant trade or professional body of at least 5 employers. Many HE institution have also pledged support (Pearson, 2016). The new Tech levels are an attempt to address how technical education is taught, with the intention to put the qualifications on a level footing with academic ones and improve Britain’s productivity (Hickey, 2017). This may be a reaction to the status of technical education in UK which currently resides near the bottom of the International League for Technical Education. The amount of vocational qualifications is once again going to be cut dramatically and new courses, more robust in nature are to replace them - much narrower in scope, but with more opportunity to specialise in a particular field. The GLH for each course will double in some cases and work placements will be mandatory for each learner. The AoC responded with concerns about funding cuts and concerns over a reduced curriculum. The tighter assessment models and external assessments,(despite their being a richer content of the new IT BTECs overall), league table pressure and cuts may well mean tutors may have to strictly teach to the syllabus to ensure success.

While no recommendations can be made, this research provides a sound basis for further study, perhaps fitting in with general vocational level 3 research, further skills research or research into moving towards a digital curriculum. Time restrictions imposed its own limitations, the researcher working full time in FE and initiating contact with aged students was time consuming.

Appendices

Appendix 1 – BTEC Unit Assessment table (2010-2015)

SDD	Unit title	LO's	Core skills / practical assessed LO's	Theory assessed Learning outcomes
Unit 1	Comms & employability	13	1 – use IT	12- explain4, discuss1 ,review1 ,evaluate, produce, demonstrate, communicate, review, follow
Unit 2	Computer Systems	13	4 – set up, configure, test, undertake	9 – compare, recommend,, explain[5], describe, evaluate, justify
Unit 3	Information Systems	12	1 - use	11 –vexplain3, discuss, describe, identify, select, illustrate, assess, generate, justify
Unit 6	Software design & dev	10	2 – use, develop	8 – describe2, explain3,outline, discuss, justify
Unit 7	Org System Security	11	0	11 – explain5, describe, review, discuss2, evaluate
Unit 8	e-Commerce	10	0	10 – explain2, describe, review, examine, plan, recommend, discuss, design, evaluate, compare
Unit 11	Systems Analysis & Design	11	0	11 - Outline, illustrate, explain2, produce,2, discuss, suggest, analyse, generate, carry out
Unit 14	Event driven programming	12	4 – demonstrate, design, implement, test, create	8 – explain, discuss, evaluate, give reasons, analyse[2]

Unit 17	IT project planning	12	1 - produce	11 – illustrate, explain2, discuss, plan, follow, review, assess, monitor, demonstrate, evaluate
Unit 18	Database Design	13	0	13 – explain, design, create2, [perform, include, test, import, export, implement, discuss, evaluate
Unit 20	Client side customisation	11	3 – design, create, test	8 – explain3,assess, discuss, employ, explore, evaluate
Unit 22	Devel Computer games	13	6 – produce2, develop, test, use2	7 – explain2, describe, determine, suggest, examine
Unit 23	HCI	11	3 – design, create, test	8 – describe, document, explain3, evaluate2
Unit 24	Controlling sys with IT	13	5 - illustrate operating , design2, implement	8 – explain5, describe, compare, suggest, evaluate
Unit 27	Web Server Scripting	13	5 – use, upload, implement, test, create	8 – explain2, compare, evaluate, recommend
Unit 28	Website Production	11	2 – create, improve	9 – explain5, outline, design, discuss, demonstrate
Unit 40	Computer Games design	12	0	12 - Describe, generate3, present3, prepare3, explain, evaluate,
Unit 42	Spreadsheet modelling	15	6 – develop, use3, customise, test,	9 – explain, export, produce, refine, analyse, compare, produce, discuss, evaluate
IT	title	LO's	Core skills / practical assessed LO's	Theory assessed Learning outcomes
Unit 1	Comms & employability	13	1 – use IT	12- explain4, discuss1 ,review1 ,evaluate, produce, demonstrate, communicate, review, follow

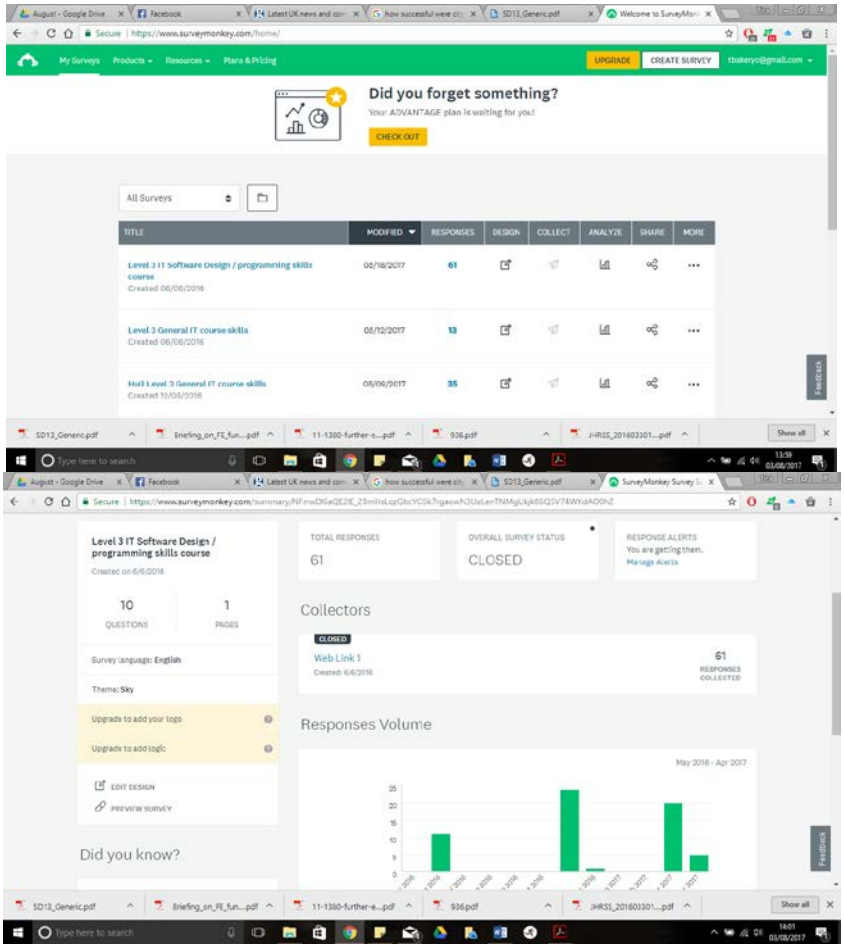
Unit 2	Computer Systems	13	4 – set up, configure, test, undertake	9 – compare, recommend,, explain[5], describe, evaluate, justify
Unit 3	Information Systems	12	1 - use	11 –vexplain3, discuss, describe, identify, select, illustrate, assess, generate, justify
Unit 6	Software Design & Dev	10	2 – use, develop	8 – describe2, explain3,outline, discuss, justify
Unit 7	Org systems security	11	0	11 – explain5, describe, review, discuss2, evaluate
Unit 8	e-Commerce	10	0	10 – explain2, describe, review, examine, plan, recommend, discuss, design, evaluate, compare
Unit 17	IT project planning	12	1 - produce	11 – illustrate, explain2, discuss, plan, follow, review, assess, monitor, demonstrate, evaluate
Unit 18	Database design	13	0	13 – explain, design, create2, [perform, include, test, import, export, implement, discuss, evaluate
Unit 20	Client side customisation	11	3 – design, create, test	8 – explain3,assess, discuss, employ, explore, evaluate
Unit 21	Website mngmt & production	13	5 – design, build, upload, produce, adapt	8 - Describe, identify, explain, compare, define, use, review, demonstrate, compare
Unit 23	HCI	11	3 – design, create, test	8 – describe, document, explain3, evaluate2
Unit 24	Controlling systems using IT	13	5 - illustrate operating , design2, implement	8 – explain5, describe, compare, suggest, evaluate
Unit 28	Website Production	11	2 – create, improve	9 – explain5, outline, design, discuss, demonstrate
Unit 30	Digital graphics	10	3 – use, create, modify	7 – describe, explain2,demonstrate, compare, justify, evaluate, discuss

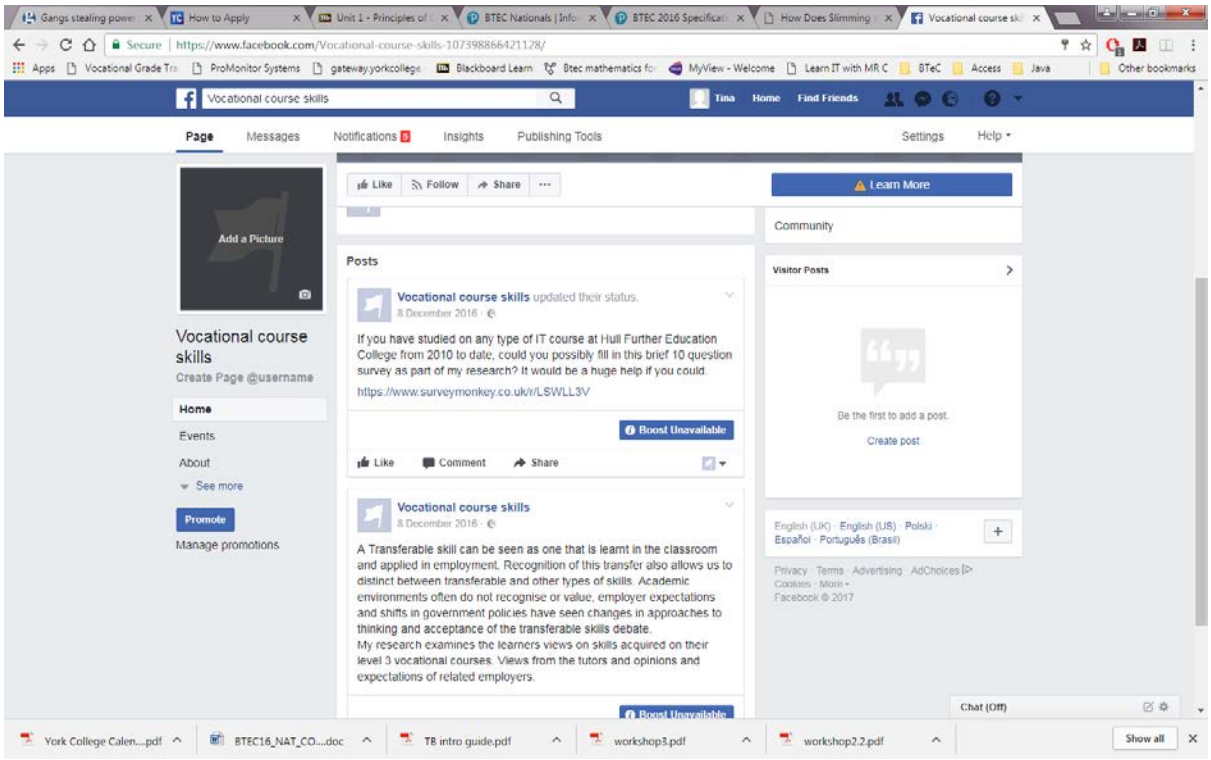
Unit 31	Computer Animation	9	3- create	6 - explain, discuss
Unit 35	Digital Graphics for Interactive Media	12	2- generate3,create3, design, implement	10 – explain2, describe, evaluate, compare
Unit 42	Spreadsheet modelling	15	6 – develop, use3, customise, test,	9 – explain, export, produce, refine, analyse, compare, produce, discuss, evaluate
Unit 43	Multimedia Design	11	6 – design2, develop, set up, demonstrate skills2, produce, adapt	5 – identify, explain, compare, evaluate, reflect, review
NTWK	title	LO's	Core skills / practical assessed LO's	Theory assessed Learning outcomes
Unit 1	Comms & employability	13	1 – use IT	12- explain4, discuss1 ,review1 ,evaluate, produce, demonstrate, communicate, review, follow
Unit 2	Computer Systems	13	4 – set up, configure, test, undertake	9 – compare, recommend,, explain[5], describe, evaluate, justify
Unit 3	Information Systems	12	1 - use	11 –vexplain3, discuss, describe, identify, select, illustrate, assess, generate, justify
Unit 5	Managing Networks	11	2 – interrogate, undertake	9 – describe, outline, explain, keep records, justify
Unit 9	Computer Networks	11	1 - make	10 - describe3, explain2, compare, design, report, justify, evaluate

Unit 10	Communications Technology	13	2 – create, set up	11 – explain, describe, assess, compare
Unit 12	IT Tech Support	13	4 – identify, use, respond, demonstrate	9 – explain3, source, check, discuss, judge, provide, review
Unit 14	Event driven programming	12	5 - Demonstrate, design, implement, test, create	7 – explain, discuss, reason, analyse, create, evluate2
Unit 19	Systems Architecture	14	4 – convert, carry out, illustrate, create	10 – explain7, compare, compare, illustrate
Unit 20	Client side customisation	11	3 – design, create, test	8 – explain3,assess, discuss, employ, explore, evaluate
Unit 25	Maintain computer systems	11	4 – perform, use, improve, test	7- explain2, assess, describe,recommend,evlauate2
Unit 26	Maths for IT practitioners	17	10 – demonstrate, perform, multiply, apply, apply, carry out2, apply, design	7 – explain2, find, discuss, plan, recognise, reflect
Unit 28	Website Production	11	2 – create, improve	9 – explain5, outline, design, discuss, demonstrate
Unit 29	Install & upgrade software	12	3– complete2, implement	9 – explain3, describe2, design2, justify, evaluate
Unit 30	Digital graphics	10	3 – use, create, modify	7 – describe, explain2,demonstrate, compare, justify, evaluate, discuss
Unit 32	Network System Security	10	1 - configure	9 – describe2, explain2, plan, suggest, report, discuss, compare
Unit 33	Supporting business activ	11	0	11 – describe2, outline, explain, plan, adopt, compare, review, analyse, evaluate, justify

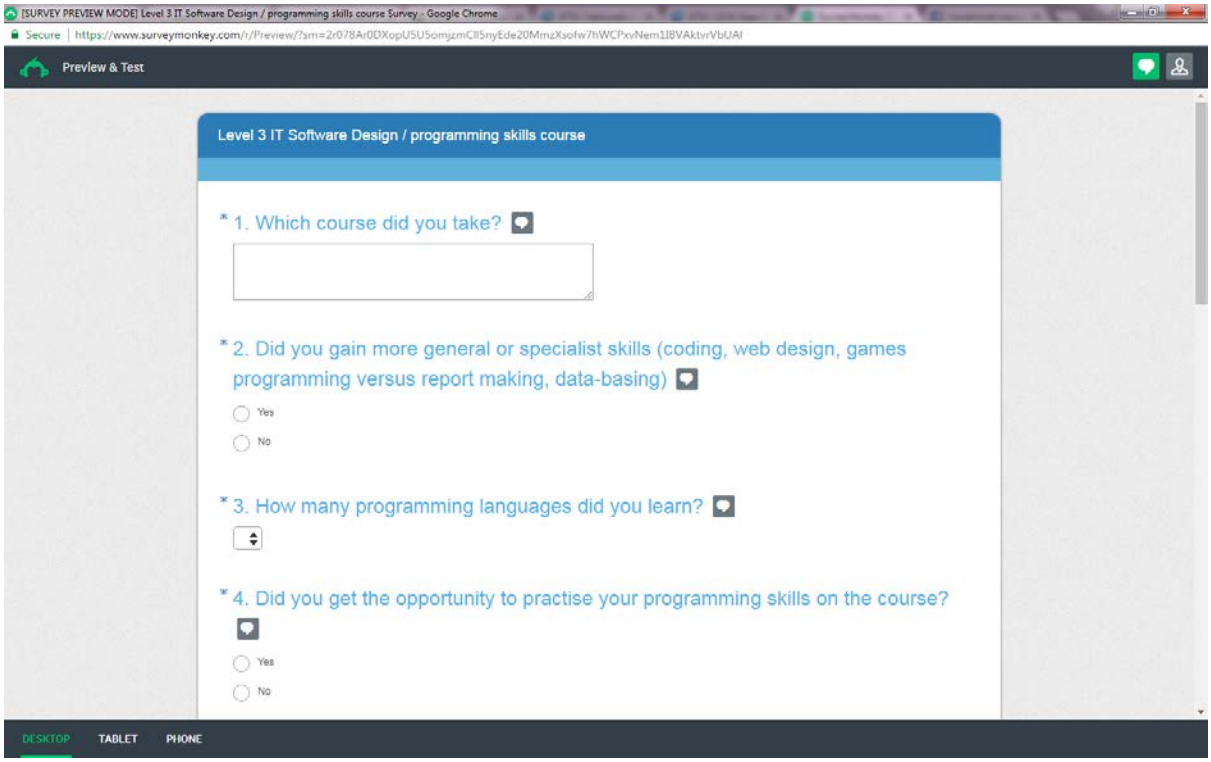
Unit 35	Digital Graphics for Interactive Media	12	2- generate3,create3, design, implement	10 – explain2, describe, evaluate, compare

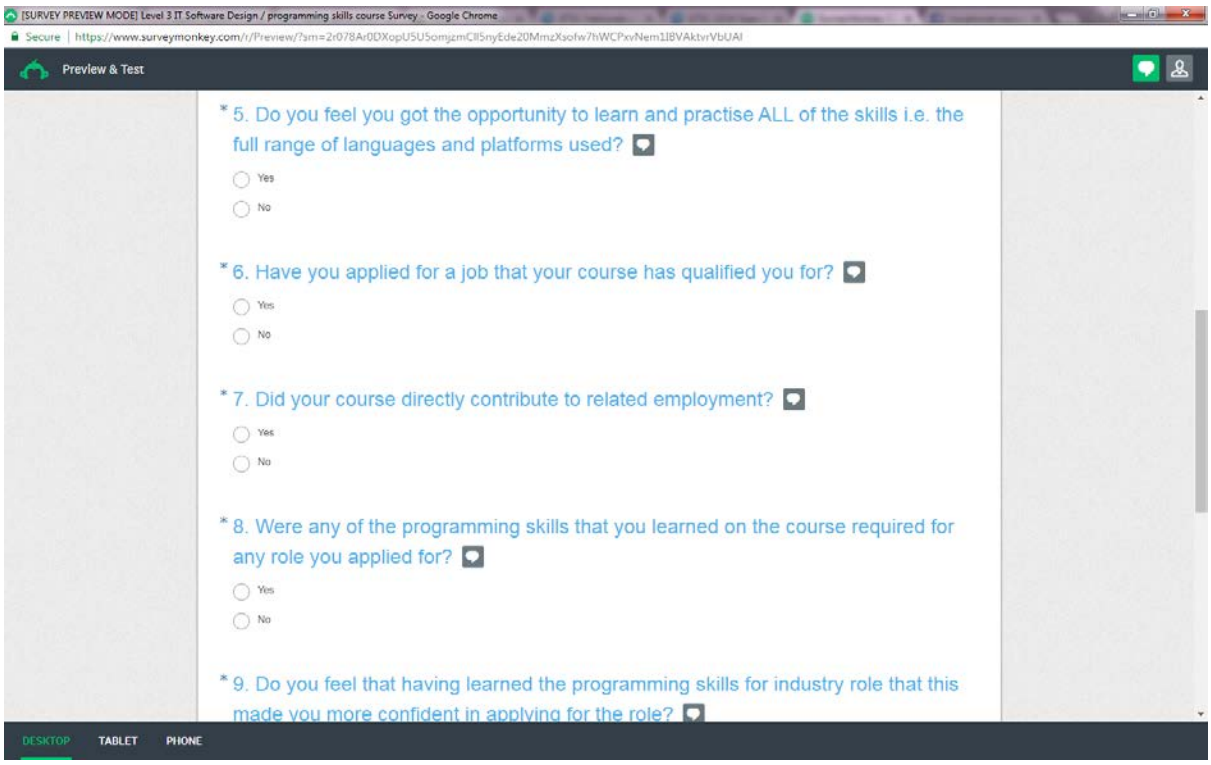
Appendix 2 – Survey Monkey entries & facebook

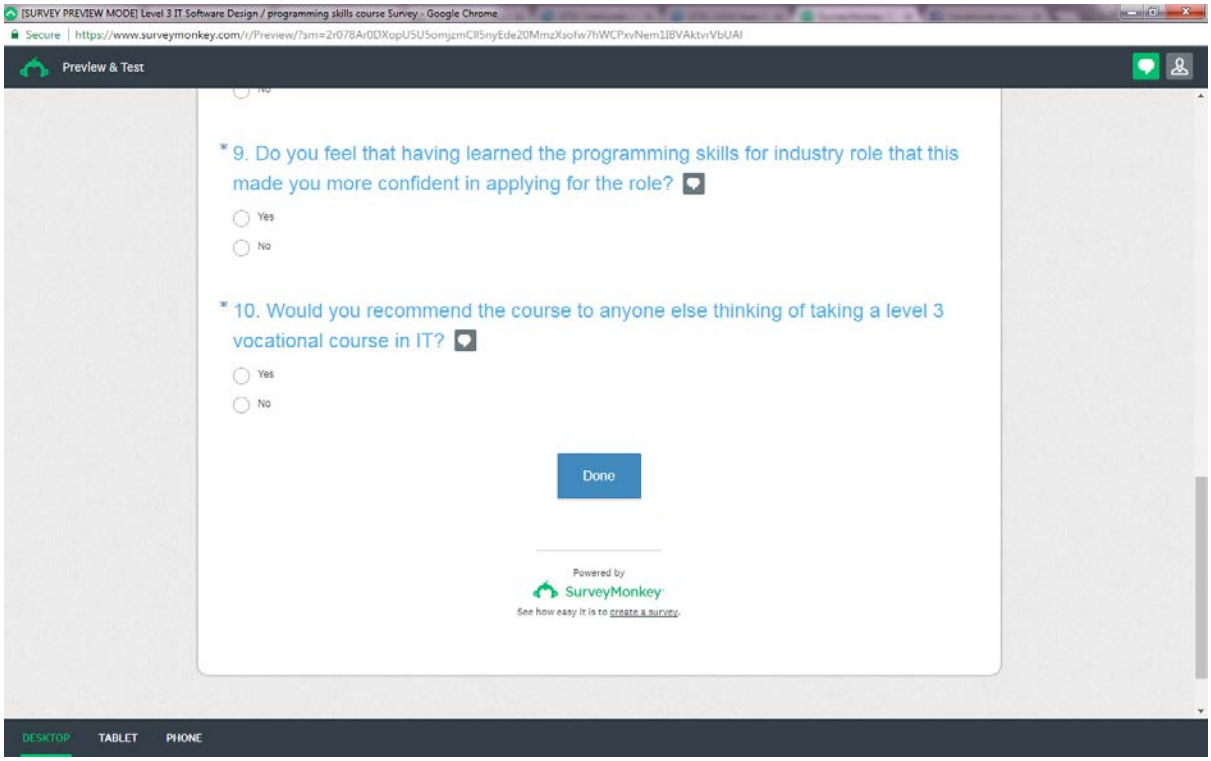




Appendix 3 – Software & Design Survey






[SURVEY PREVIEW MODE] Level 3 IT Software Design / programming skills course Survey - Google Chrome
Secure | https://www.surveymonkey.com/r/Preview/?sm=2r078Ar0DXopU5U5omjzmCll5nyEde20MmzXsofw7hWCPxvNem1IBVAktvrVbUAI
Preview & Test
* 9. Do you feel that having learned the programming skills for industry role that this made you more confident in applying for the role?
Yes
No
* 10. Would you recommend the course to anyone else thinking of taking a level 3 vocational course in IT?
Yes
No
Done
Powered by SurveyMonkey
See how easy it is to create a survey.
DESKTOP
TABLET
PHONE

Appendix 5 – Consent form

Consent form

Name …….. Date ……..

Has the purpose of the research been explained to you? Yes / No

Have you been given the opportunity to ask questions about this research? Yes / No

Do you understand that you are going to be recorded and you have the right to ask for the recorder to be switched off at any point and that you do not have to answer any questions that you do not wish to? Yes / No

Interview recordings will be for the researcher's purpose only and access to this will be limited to the researcher and a supervisor alone and will not be included in the final document. You identity will be kept hidden at all times and you will not be able to be identified through answers submitted.

I agree to take part in this research

Signed…… Date ……..

Appendix 5 – interview initial questionnaire

1. Did your vocational course directly contribute to your related employment success?

2. Did you obtain valuable related skills on your course?

3. Did you obtain other more general skills as opposed to trade skills?

4. Did your course offer the opportunity to learn and practise new skills?

5. Did your course relate to the required skills in a job role?

6. Did your course have a positive affect on your employment prospectives?

7. Did the skills learnt on your course give you the confidence to apply for related job roles?

8. Did the course contribute to your success in a work role?

9. Would you recommend your course to other people wanting the same career?

Did your vocational course directly contribute to your related employment success?

Yeah, I could not have applied for the job I did if I hadn't done the course. I needed to know the stuff I had learned for the job, and looking back, I am glad things went wrong as often as they did – we had only broken PC's or problems to fix, not computers that are working fine.What was that phrase you told us PICNIC? (problem in chair not in computer – yeah that was it) its true.

Did you obtain valuable related skills on your course?

Skills as in on computers? God yeah, I thought I knew a bit about computers when I started but all the stuff we have learned was really helpful. I loved the bit about overclocking too, [you] told us it was not part of the course but was right when you said we would know what we were talking about once we done it – I've used that loads of times with customers.

Did you obtain other more general skills as opposed to core skills?

Nah not really – [you] had to teach us some bits and pieces about professional documentation but most of the course was doing stuff and fixing stuff, if we couldn't explain it to you, we didn't know it – that's what you used to say.

Did our course offer the opportunity to learn and practised these core skills?

Yeah – [you] always let us in. helping the new starters was brill too – we had to know what we were talking about in case they were smarter than us [laughs], really made me feel like I knew my stuff and I think that's what gave me the courage to go for the IT support job I got.

Apart from the customer skills unit which had some writing to do, all the units were doing stuff, I loved coming in, the days went o quickly.

Did you course relate to the required skills in a job role?

God yeah – even when I started at my job it was front line support and we had to ask scripted questions, it made them feel better (and me actually ha ha) because I knew what I was talking about, and them most of the time. The Desktop Support stuff was really helpful and I think that on my CV is what swayed it. There were that many jobs about especially for college leavers.I was really lucky to get in but I had more to offer I guess. They obviously like me 'cos I am still there!

Did your course have a positive effect on your employment prospectives?

Yeah like I said, I learnt loads got two qualifications instead of one and it started my career off. I am now 3rd line support for the council and have my own specialist area.

Did the skills learnt on your course give you the confidence to apply for related job roles?

It did. I wouldn't have applied for an IT job if I hadn't gone on the course but [you] gave us the confidence to try more and deal with customers face to face. How many times was the door going in the lab with students bringing in broken USB sticks, laptops or pc's, it was great experience. I think as well as having the older machines to practise on and it not mattering if we went wrong really helped, we weren't frightened to break stuff – do you remember the spark and bang that time {laughs}…

Did your course contribute to your success in a work role

Yea, like I said. I don't really remember the units but I remember starting at the beinning about learning the parts inside, building the breaking then troubleshooting then sixing before we moved on to ntworks. I remember beign allowed to come in on break times, being allowd to practise as much as we wanted.

Would you recommend your course to other people wanting the same career?

God yeah, but we know it doesn't run any more. My brother did a BTEC after me and it was sh*t (can I say Sh*t?) he didn't learn a thing and barely could code at the end of it.

I used to love it when one of use had got into an argument online about something technical, we would come in and tell [you] and you would always say, lets see if we can prove it. Some of the stuff we did was mental, like connecting all those old Dells into that one server and pushing the network till it fell over (ha ha) god I am surprised they even worked they were so basic and old.

Could you give me your name for the recording please?

PA1

Did your vocational course directly contribute to your related employment success?

Yeah, I could not have applied for the job I did if I hadn't done the course. I needed to know the stuff I had learned for the job, and looking back, I am glad things went wrong as often as they did – we had only broken PC's or problems to fix, not computers that are working fine. What was that phrase you told us PICNIC? (problem in chair not in computer – yeah that was it) its true.

Commented [TB1]: Impact of extra skills practise / learning

Commented [TB2]: Impact of tutor statements

Did you obtain valuable related skills on your course?

Skills as in on computers? God yeah, I thought I knew a bit about computers when I started but all the stuff we have learned was really helpful. I loved the bit about overclocking too, [you] told us it was not part of the course but was right when you said we would know what we were talking about once we done it – I've used that loads of times with customers.

Commented [TB3]: Vocational knowledge & experience

Commented [TB4]: Extra skills learning

Commented [TB5]: Mapped learning to real employment

Did you obtain other more general skills as opposed to core skills?

Nah not really – [you] had to teach us some bits and pieces about professional documentation but most of the course was doing stuff and fixing stuff, if we couldn't explain it to you, we didn't know it – that's what you used to say.

Commented [TB6]: Skills knowledge

Did our course offer the opportunity to learn and practised these core skills?

Yeah – [you] always let us in, helping the new starters was brill too – we had to know what we were talking about in case they were smarter than us [laughs], really made me feel like I knew my stuff and I think that's what gave me the courage to go for the IT support job I got.

Commented [TB7]: Tutor relationship

Commented [TB8]: Impact of extra skills practise / learning

Commented [TB9]: Mapped learning to real employment

Apart from the customer skills unit which had some writing to do, all the units were doing stuff, I loved coming in, the days went o quickly.

Commented [TB10]: Reluctance to learn?

Did you course relate to the required skills in a job role?

God yeah – even when I started at my job it was front line support and we had to ask scripted questions, it made them feel better (and me actually ha ha) because I knew what I was talking about, and them most of the time. The Desktop Support stuff was really helpful and I think that on my CV is what swayed it. There were that many jobs about especially for college leavers. I was really lucky to get in but I had more to offer I guess. They obviously like me 'cos I am still there!

Commented [TB11]: Confidence from skills practise

Commented [TB12]: Bonus for employment progression

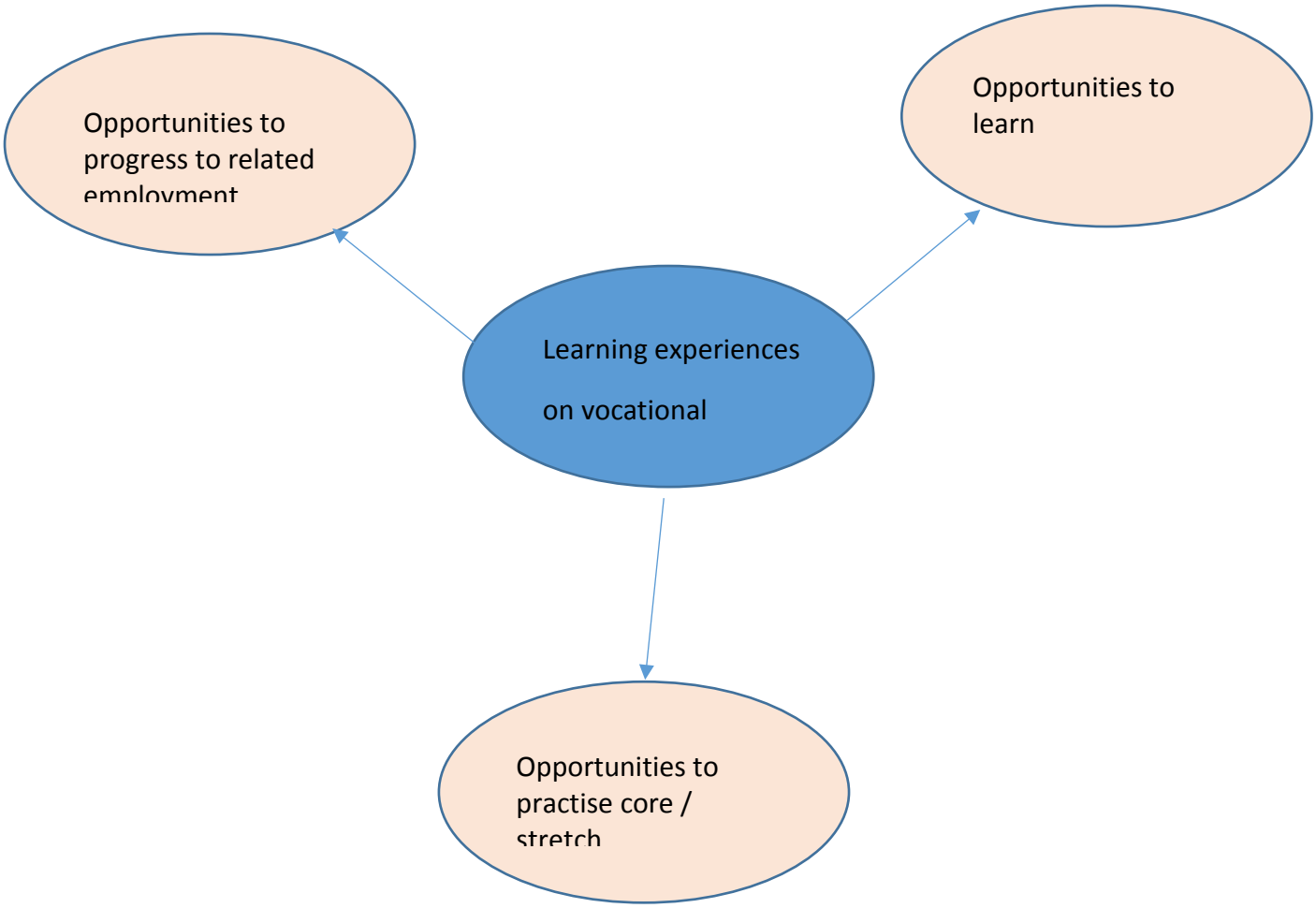
Did your course have a positive effect on your employment prospectives?

Yeah like I said, I learnt loads got two qualifications instead of one and it started my career off. I am now 3rd line support for the council and have my own specialist area.

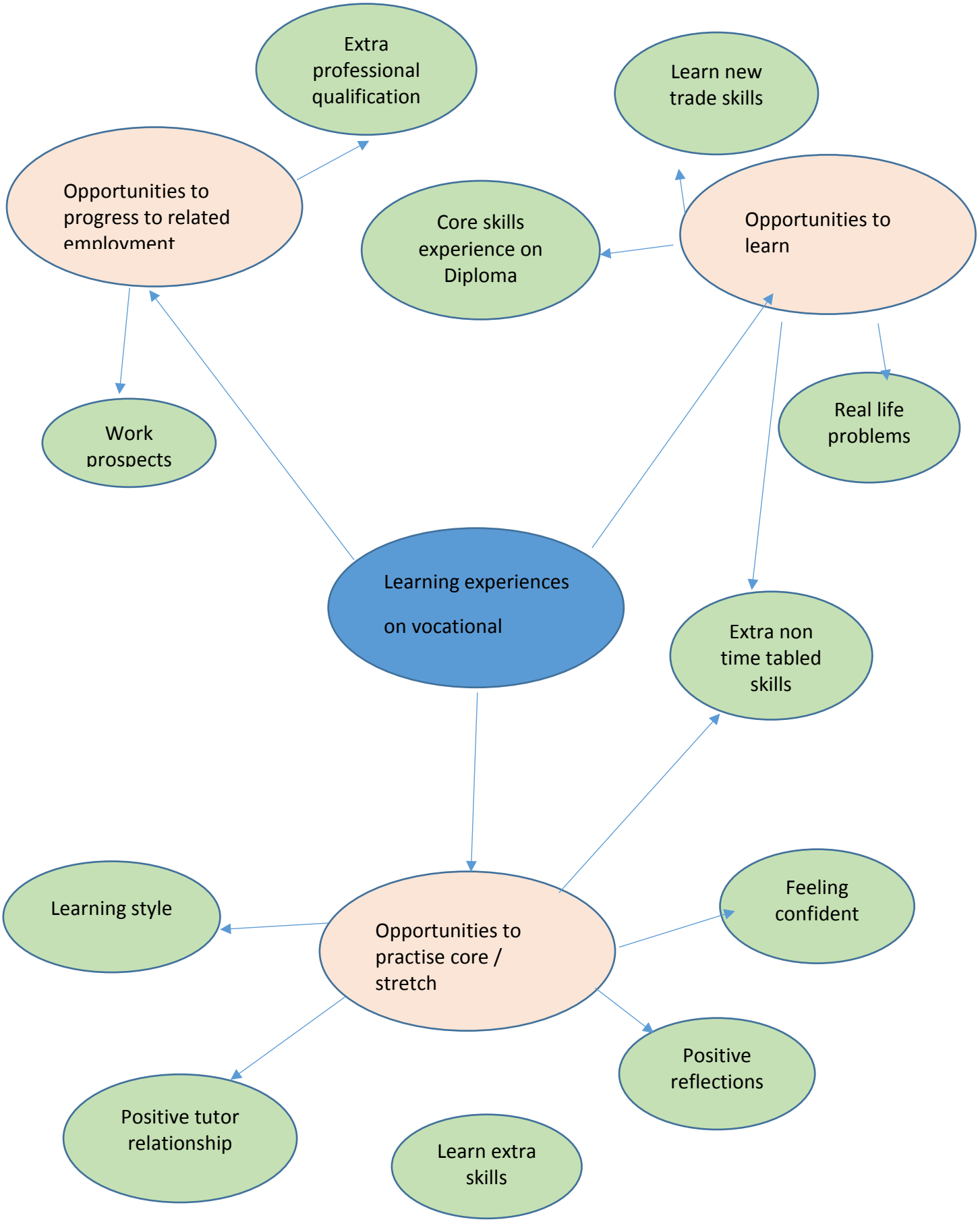
Commented [TB13]: Bonus for employment progression

Did the skills learnt on your course give you the confidence to apply for related job roles?

Appendix 8 – initial theme



Appendix 9 – diagrammatical theme representation



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