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Abstract

This paper describes and evaluates an approach to online supported, work-focused learning where undergraduate students operate as action-researchers; planning and implementing action for improvement in their workplace as a basis for award-bearing credit in higher education. A model is proposed for a meaningful, ongoing tripartite relationship between the Higher Education Institution, learner and small and medium enterprises that is viable. The way the design enables the learner to develop their "higher level skills that embody the essence of higher education" (Willis, 2008) is an important issue if the ideas and approach are to be widely adopted. The paper outlines the curriculum design and the nature of the students work-focused inquiries. Data from final year research reports was analysed to identify the characteristics of the projects undertaken by students uncovering 'who they have become'. Challenges and issues of the approach are discussed.

Introduction & background

This paper draws upon the authors' experience of the Ultraversity Project (Millwood, Powell and Tindal, 2008) at Anglia Ruskin University where an approach for undergraduate studies was developed that operates at the nexus of models of work-based learning and student as researcher or critical inquirer (Stenhouse 1981). The approach in place is distance-learning supported through online communities of inquiry and produced 325 honours graduates between 2006-2008.

For many years HEIs have attempted to become more agile at providing work-based learning and the Leitch Report (2006) has contributed to the development of a rhetoric around employer-led learning and increasingly employer funding of the cost of Higher Education for students in the workforce.

General criticisms of work-based learning include the complexity of demands placed on university systems and the labour intensive nature of support required; these issues can be seen as resulting in a model for provision of HE that is not cost effective, although in identifying these criticisms, Costley and Armsby (2008) call on universities to think again about the way they do things. A significant challenge experienced by the authors is how to develop programmes that engage with employers and at the same time are cost effective to initiate and deliver meeting the needs of the learner and the employer. The model of undergraduate student as action-researcher is presented as a viable contribution to meeting this challenge particularly for HEIs seeking to increase their engagement with Small and Medium Enterprises (SMEs).

The Willis (2008) report into Workforce Development highlights a potential difficulty for higher educational institutions (HEIs) when working on employer-led learning initiatives by drawing a distinction between professional training and professional education where*:*

> *"There will be an emphasis upon higher level skills that embody the essence of higher education - for example, reflection, analysis, problem solving, creativity, evaluation, and an open-endedness about what emerges from the learning"* (HEA, 2008).

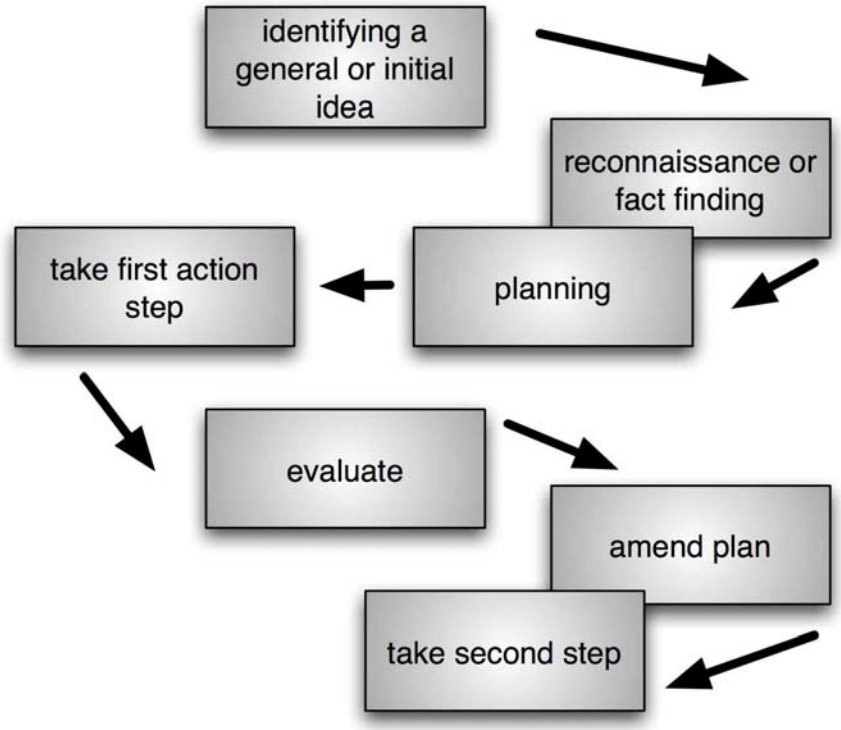
The authors propose that the undergraduate student as action-researcher encapsulates this ideal. Individuals are required to negotiate their curriculum in response to issues and opportunities in the work-place. This approach is designed to develop 'critical thinking skills' unlike professional training where the emphasis is on functional skills and learning information.

The authors present a report of the approach developed ,explaining the curriculum design, identifying the characteristics of the projects undertaken by students uncovering 'who they have become' and the nature of the contributions they have made to their workplaces. Challenges and issues of the approach are discussed.

Work-focused learning

Action-research is based upon the central tenet of making an intervention in a situation to improve it. Described by Kurt Lewin (1946) and subsequently revised and adapted many times over in different contexts, action-research can be characterised as a cyclical process (Figure 1) of informed and intentional actions designed to address an identified issue or opportunity.

Figure 1: The Action Research Process (after Lewin 1946)



The many traditions of action-research hold different assumptions about the nature of inquiry (Denzin and Lincoln, 2005). For example, approaches may emphasise the practice of the individual or collaborative acts of inquiry. Some action-researchers chose a critical stance encompassing the power and organisational relationships of a particular context, whilst others align themselves with the organisational goals with the aim of removing barriers to help better achieve them; other interpretations are also made.

For our purpose, the emphasis is on the development of the individual as described by Kemmis and McTaggart (2005):

> *"The criterion of success is not whether participants have followed the stages faithfully but rather whether they have strong and authentic sense of development and evolution in their practices, and the situations in which they practice."*

Learners undertake systematic inquiries with the explicit intention to improve their work-practice as a "practitioner-researcher" (Robson, 2002). To draw a distinction between this and other approaches to work-based learning, we have chosen to use the term work-focused learning.

The potential of the action-research approach for learners in the workplace is supported by the observation from Brew (2007):

> *"For the students who are the professionals of the future, developing the ability to investigate problems, make judgments on the basis of sound evidence, take decisions on a rational basis, and understand what they are doing and why is vital. Research and inquiry is not just for those who choose to pursue an academic career. It is central to professional life in the twenty-first century."*

In the context of work-focused learning many learners are already relatively mature in the way that they make sense of the world. The interdisciplinary nature of their inquiries exposes them to different epistemological viewpoints as they mature as learners. The desire of learners undertaking inquiry based courses to have a 'supportive framework' for their independent study is reported by Millwood, Powell and Tindal (2008) and described as "bounded independence" by Levy (2008).

Methodology

The approach taken is one of case study. The authors have drawn upon their experience of developing the model of learning for the Ultraversity project to provide an interpretative evaluation of the work undertaken. A qualitative data analysis provided further evidence of the learners' experiences of the implementation of the model. The central data for this study was a random selection of 20 submissions created by successful final year students to complete their major project. The authors examined 'statements' within the work to identify the characteristics of the inquiries undertaken by learners. This approach was intended to seek theoretical ideas arising from using the data together to test the premise of undergraduate student as action-researcher. At this stage there was a transition from theory-seeking through theory-creation to theory-testing, as described by Bassey:

> *"Theory-seeking and theory-testing case studies: particular studies of general issues - [aim] to lead to fuzzy propositions (more tentative) or fuzzy generalisations (less tentative) and conveying these, their context and the evidence leading to them, to interested audiences."* (Bassey 1999).

Curriculum design

Module learning outcomes, learning activities and assessment criteria were designed to enable the concept of student as action-researcher to be applied to, and achieved in, diverse work contexts where there is an opportunity for undertaking inquiries of substance. Learners are required to act together to support each other in an online community of inquiry exhibiting the characteristics of a Community of Practice (Wenger, 1999) in that they share a common set of research practices, form groups with common research themes or domains and are bound together in a community with the purpose of studying for a degree.

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High level aims

The programme aims describe a coherent set of intended outcomes for the learner as a critically reflective problem solver who is able to take effective action for improvement within their work-context as a part of their ongoing studies:

Table 1: Module Outline: Analysing the Professional Context (HE Level 7)

Description and Purpose of Module In this module you will critically examine your work-role within the wider context of your organisation, the professions that impact on your work and the subject disciplines that provide conceptual understanding. You will identify significant incidents of change that have contributed to the current position of your chosen field of practice within your organisation. This approach to learning also has collaboration at its heart. To his end, you will be required to actively participate in an online community of inquiry where you will be required to regularly share plans, ideas and findings for receiving and offering critical feedback. You will develop a historical perspective of your chosen field of practice and 'future gaze' to identify how new and emerging ideas will affect your organisation and work-role and articulate this perspective in debate. You will reflect upon and evaluate your own professional practice to identify current opportunities for innovation around professional or technical issues and develop a professional development plan.	
Intended Learning Outcomes. When you have successfully completed this module you will:	**Assessment criteria**. To demonstrate that you have achieved the learning outcome you will:
Locate your chosen field of practice relative to professional domains, specialisms, subject disciplines	Show the inter-professional and inter-disciplinary connections of your work and identify bodies of knowledge that extend these and contribute to your professional development
Analyse key issues of professional argument, debate or controversy within your chosen field of practice in debate with other student researchers with historical perspective and foresight	Produce a critical account of consensual and competing ideas in your professional context using illustrative examples to support your interpretation, drawing from your contributions to debate with other student researchers
Critically evaluate professional requirements for your chosen field of practice in relation to your skills set and experience and your organisation's priorities for development	Synthesise different sources of information and carry out a gap analysis to identify in systematic way foci for your professional development
Identify and critically evaluate opportunities for professional development within your work-context. Recommend future action informed by findings and conclusions.	Produce a personal development plan that integrates work-based opportunities for learning with future module requirements.

Learning outcomes, assessment criteria and the individual learning plan

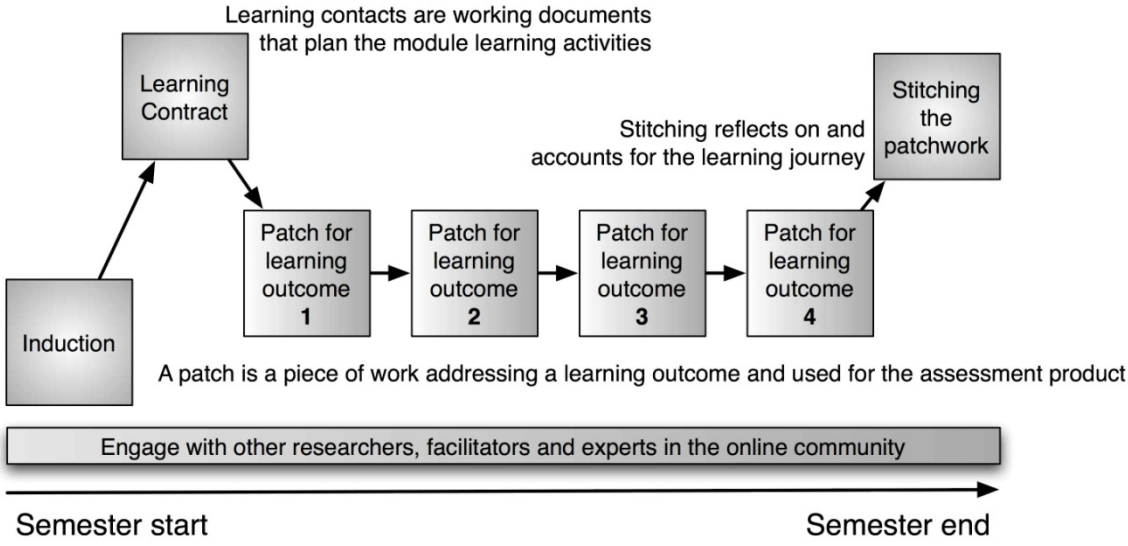
The concept of variety used in Cybernetics analysis is useful in illuminating the challenge of responding to curriculum design for different contexts. In writing about organisational structure, Beer (1979) describes variety as "the total number of possible states of a system, and offers a useful tool for dealing with variety in this short phrase "Variety absorbs variety". One interpretation of the mainstream approaches to work based learning is that variety of students and work-contexts is being 'absorbed' by increases in the numbers of courses, modules and routes being developed and offered.

The approach developed by the authors seeks to absorb variety through a limited number of generic modules where learning outcomes and assessment criteria enable learners in different work-places and contexts to personalise their learning through negotiation within each module. Rather than specifying a syllabus of discipline knowledge the curriculum describes processes that lead to the development of student capabilities.

The modules offer a high degree of flexibility enabling the individual to direct their studies within the workplace. Two approaches are used to support this, the agreement of an individual learning plan, or in some cases research proposal, these are working documents that set out what the student-researcher intends to do for a learning activity against each learning outcome and is agreed as a 'contract' between the university and the learner. This process is supported through the online community with discussions between students and in individual negotiations and final sign-off by the learning facilitator. This 'flexibility through negotiation' is a viable and valuable component of our personalised learning pedagogy.

Assessment is based on a development of Winter's (2003) Patchwork Text. For each learning outcome students design a learning activity and produce a 'patch'. These accumulate, building an ongoing collection that forms an overall inquiry as specified by the module learning outcomes. Individual patches may be authored in different styles including the creative, imaginative and academic. For final submission, they stitch their patches together to create a retrospective commentary on their own learning in relation to intended learning outcomes forming an holistic approach to learning, teaching, and assessment Bigg's (2003) "Constructive Alignment".

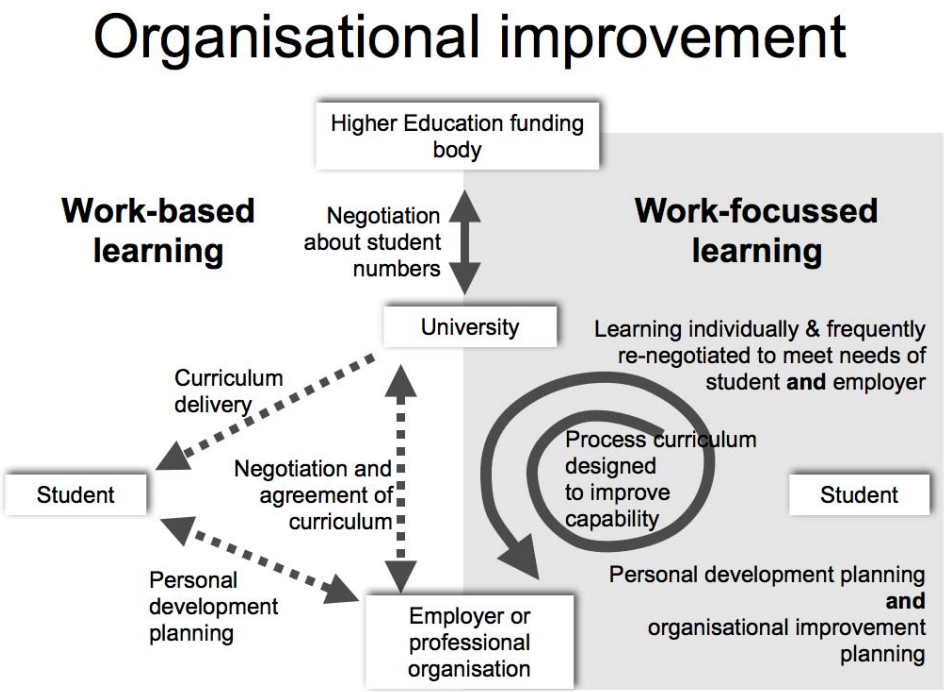
Figure 2: Patchwork Text Process



Stakeholder relationships

The work-focused approach has significant implications for the expectations, roles and responsibilities of the stakeholders involved; it offers an alternative model for arranging the tripartite relationships between employer, learner, and the educational institution. This new relationship is illustrated by Figure 3 below.

Figure 3: Contextualising the work-focused approach



Work-based learning curricula are commonly developed through a negotiation between the university and the employer and then delivered to the learner as shown on the left hand side of the diagram. In the work-focused learning approach a process of needs analysis defines the focus of the inquiry. This process is led by the the learner and requires them to identify relevant standards, professional and other requirements pertinent to their workplace and role within it. This identification process is facilitated by the university but also requires the learner to identify a workplace advocate who will offer support and guidance. Rather than a contractual agreement between the employer and the university on the precise nature of a syllabus that will be delivered, there is the need to trust that the facilitators of the learning process can guide the learners in selecting, planning, and executing their inquiries and that this approach will have the dual purpose of improving the 'business' of the employer as well as developing the learner in line with the learning outcomes described by the programme.

Characteristics of projects undertaken

Table 2 illustrates some typical contexts and foci of action-research projects undertaken.

Table 2: Student researcher inquiry foci

Workplace and role	Action-research focus in the words of the student researcher
Third sector – Project leader in New Media Design and Development Unit	I wanted to carry out an enquiry that would have some impact and benefit on the work that I do, and also involve my blind and partially sighted colleagues...it was designed to investigate how I could improve the product evaluation process for blind and partially sighted colleagues.
Nursery School - Manager	My aim was to look into how I could implement a better system of working with parents, using accessible homemade activities, which would not only help and reinforce their role as the baby's prime educator but also create working links between home and Nursery
FE College - Teacher	My research utilised action research methods, through which three phases in the development of a learning object were examined using three data collection methods.
School - Office Manager	The aim of the project centred on finding out whether the process of two-way communication flow between classroom-based staff and office staff is efficient, and if not, to investigate ways and means to effect an improvement.
Primary School - Administrator	...existing culture in school for Teaching Assistants seemed to me to be that of the underdog... there was an underlying theme of being undervalued. As a consequence morale was low... from previous research I found that Teaching Assistants on the whole felt undervalued and not part of the 'team'. Lack of communication seemed to be a recurring gripe, almost a feeling of being excluded.

Analysis of assessment products led the authors to draw distinctions and identify four characteristics of the action-research undertaken:

1. Application of action research methodology and research methods - students were able to design and apply a rigorous approach to their inquiries.

> *"I used the cyclical process of action research (Kemmis and Wilkinson 1998) plan – do – review. This provided me with scope to conduct my research over 3 cycles…Improvement and involvement are central to action research. Collaboration between researchers and those who*

are the focus of the research, and their participation in the process, are seen as central to action research. This relationship fits well with the approach of flexible, qualitative design.

"The data acquired was then analysed to examine changes in the effectiveness of the (Digital Learning Object) DLO. The formal defence of my research will address the critique given by a number of parties (exhibition audience, fellow students, learning facilitators and myself the researcher) resulting in a validation of my research showing evidence of both its short and long term impact upon the main stakeholders. The methodological approach used in my research was designed to produce data that could undergo a trend analysis of the perceived improvement in the effectiveness of the DLO."

2. Improvement to personal practice - students demonstrated critical awareness and ability to improve their working practices:

"Improvements to working practice as a direct result of Action Inquiries undertaken throughout the three years of study continue to benefit my reputation as a innovative and creative practitioner. Adoption of episodic lesson planning that allows for the non-linear progression of SEN Students is one example of the application of Action Research to improve practice.

"My efforts so far have changed procedures, developed communication, raised morale and formed a cohesive group which offers support to each other. My research area has developed my school role beyond what was first perceived as my role as school administrator. The research activity has also resulted in new responsibilities being offered and professional recognition by the workplace."

3. Significant contribution to relevant professional knowledge - students develop new contextual understanding contributing to the overall understanding of the business of the enterprise as a learning organisation:

"As a consequence of my research the headteacher has asked me to look into co-ordinating the Investors in People project for our school this year. He has seen the value of my research and how successfully and professionally I have approached it and I think that this has had an impact on him in that he feels I will be able to successfully steer the school through the Investors in People programme.

"I honestly do contribute this success down to what I learnt during my degree programme. I led some whole school action research on the implementation of the VLE and recently on a programme called PASS which evaluates pupils attitudes towards themselves and school.... Our authority really bought into the SIG school improvement Model, which is effectively Action Research based, and what I learnt from this degree really put me at the front in my school for leading whole school change..."

4. Wider impact across the work-place - organisations recognise and value the growing capability of students to provoke others in the workplace to improve their practice:

"*Disseminating the exhibition to an audience of teachers and Governors has opened up the possibility of developing AR for staff development and made other people in the school community more aware of the potential of the VLE. As the VLE coordinator I can now speak from first hand knowledge about study via a VLE.*

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"An action inquiry into personal safety in the workplace made people more aware of the dangers of lone working. I am now regularly consulted and also remind people of issues surrounding this. I am still issuing personal alarms to members of staff in my department and have been called on outside of my department to issue alarms and demonstrate their use.

"To top it all off, I was on secondment to my HR department as staffside lead for the KSF, following major changes in the Health and Social Care in Northern Ireland. , I under went a 40 minute interview and was given a HR post in Learning and Development with responsibility for widening participation across the whole of the South Eastern Health and Social Care Trust covering over 10,000 staff; working with local further education providers with the result that I have doubled my pay from what I had earned as a nursing auxiliary."

Discussion

Levy (2008) identifies two broad 'conceptual frames' in seeking to better understand undergraduates' experience of 'inquiry and research' based upon a study of first year undergraduates from the Faculties of Arts and Social Sciences at Sheffield University. Based upon these students' accounts, Levy identified the frames "exploring and acquiring existing disciplinary knowledge" and "participating in building disciplinary knowledge" that offered characterisations of their experiences.

Levy's frames focus on contribution to "disciplinary knowledge" this is a term that does not sit easily with work-focused learning. Professional development in the workplace can often be inter-disciplinary. Authentic learning of this nature often draws on a range of disciplines, the learning is highly contextualised, inquiries are small scale. Our analysis shows that in the context of work-focused learning there are significant differences to the conceptual framework developed by Levy. For example; rather than contributing to disciplinary knowledge, work-focused learners contribute to 'relevant professional knowledge'; the authors believe this contribution to be of significant value and indicates that undergraduates following this kind of curriculum are able to operate as effective researchers.

Demonstrating the real benefits of SMEs funding students through higher education is a significant challenge for HEI. For larger employers, developing bespoke courses by negotiating and agreeing a syllabus in collaboration with HEI providers is a practical and viable approach as the initial resource required to set-up a course can be justified by the numbers of students. For SMEs this may not be a financially viable approach; the development of the student as researcher approach is one solution to providing courses that are suited to diverse employment contexts and accessible to SMEs without large resource requirements at set-up. It is likely that engaging with employers will continue to be a significant challenge for employer-facing institutions as government priorities increasingly encourage this approach. The recent merging of the Department for Innovation, Universities and Skills with the business department being an example of this.

Since the inception of the degree, engagement with public sector institutions has been significant and feedback from these organisations has indicated that the approach is valued as a viable means of improving staff effectiveness and disseminating improved practice across the workplace and beyond. Although we have had some take-up from SMEs in the private sector, it has proved much harder to recruit students. The authors suggest that work-place cultures, budget constraints, and perceived value of developing an existing workforce towards a graduate one may not be seen as a priority. Alternatively, it may simply be a reflection of the orientation of marketting.

Another set of practical challenges revolve around making a success of 'mainstreaming' innovations in higher education. As outlined by Costley and Armsby (2008) if HEIs are to develop new ways of

delivering provision then their processes and systems will need to change to reflect a diverse student body, not simply based around a model that serves UCAS recruited undergraduates. The curriculum design described is significantly different from that which most potential students, university teaching staff, and employers are familiar with and as a result a significant effort is required to explain and 'justify' it in terms of being a valid approach to gain a higher qualification. Practices, processes and systems can be inflexible in accommodating approaches that are unfamiliar and not designed to align with the requirements of traditional undergraduate students who study full-time at university from 18 years of age. The challenge of 'normalisation' of new approaches and initiatives is an ever present one.

Conclusions

The tripartite model proposed provides an effective approach for addressing the needs of the learner and employers and has delivered work-focused learning that has lead to improvement in the workplace. Arguably the real value is not what the undergraduate students operating as action-researchers learn or contribute to their workplace whilst studying but rather it is 'who they have become' and what they are able to offer their workplaces as graduate level employees with a potential lifelong habit of action for improvement. Graduates who have experienced this approach acquire research and inquiry skills that provokes significant recognition by the workplace, positioning them with the capability to be at the front line of leading improvement initiatives in their organisations.

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