Developing vocational practice in the jewelry sector through the incubation of a new 'project-object'

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Abstract

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1. Introduction

The creative industries, which encompass art and design, performing arts, film, television etc, have moved from the fringe to the mainstream of national economies in the last decade, because they are widely perceived as a major trigger for the further transformation of post-industrial economies (Bilton, 2006; Florida, 2002). All industries in the UK face, according to a recent Department of Trade and Industry (DtI) paper *UK competitiveness: moving to the next stage* (Porter & Ketels, 2003), the economic challenge of moving from an economic model based on increasing the level of labour force utilisation to an 'Innovation-Driven' model based on the upgrading of productivity by competing on 'more unique and more innovative products and services'. This model requires new management behaviour, targeted investments and the strengthening of and the creation of 'new ties between educational institutions and industry' (Porter & Ketels, 2003, p. 44).

The recommendations contained in the Treasury commissioned review of the future skill needs of the UK economy from Lord Leitch (2007) falls, however, firmly between the labour utilization and innovation economic models. The report argues that productivity should be increased and skill levels raised, however, it only prioritises funding basic skills (i.e. literacy and numeracy) and at UK Level 2 qualifications. There are a number of problems with this strategy: first, these qualifications, as (Delorenzi, 2007, p. vi) points out, 'are often used as a way to certify existing skills rather than helping people to acquire new ones'; and, second, increases in productivity are best achieved either by managing the labour force more effectively (Keep, 2007) or by supporting adults who already hold Level 3 qualifications to broaden the base of their expertise (Delorenzi, 2007, p. ix). Unfortunately, neither work organisation, job design nor funding for horizontal skill formation is centre-stage in the post-Leitch policy debate in the UK.

This suggests that if the government is to realize its vision of an innovation-driven economy it faces an additional challenge, namely to supplement its skills agenda by

developing strategies that explicitly integrates product and service innovation and education and training. One way to achieve this goal is to support the extension of schemes that offer companies a combination of human and financial resources to develop a more innovative approach to product and service development, and offer adult entrants to or adult 'switchers' in the labour market opportunities to develop the forms of vocational practice that will support both their employability in the global economy (Guile, forthcoming). Such schemes are, therefore, paradigmatic examples of the interface between individual and organizational contributions to workplace learning.

Drawing on research undertaken through the auspices of the European Union EQUAL Programme *The Last Mile* Project (TLM)[1]. The paper analyses a work placement scheme that has been established to create the conditions to incubate new designs in the jewelry sector in Birmingham. The paper begins with a discussion of the theoretical framework it has employed to analyse individual and organizational contributions to workplace learning in this scheme. It then moves on to identify the specific strategies and tactics used by: (i) the different organisations involved with the scheme to facilitate the incubation of the new designs; (ii) an aspiring jewelry designer to create a new product range for the company. The paper concludes with a discussion of the implications of this conceptual framework for the field of workplace learning.

2. Learning, work and work placements

2.1. From workplace learning to learning to create new products and services

The field of workplace learning has developed exponentially over the last two decades as writers have either reformulated existing concepts or generated new concepts to analyse learning at work in a wide variety of different settings. Broadly speaking, a number of different theoretical approaches can be identified. One is the post-Lave and Wenger socio-cultural and social practice tradition, represented by writers such as Billett and Fuller and Unwin. Billett (2003) has developed the notion of 'participation' in Lave and Wenger's work by formulating the concepts 'agentic activity', 'participatory practices' and 'invitational qualities' to analyse the way in which individuals' continually 'remake' aspects of vocational practice. In contrast, Fuller and Unwin (2003b) have broadened the concept of participation by formulating the concepts 'expansive' and 'restrictive' environments in order to differentiate carefully between the way in which different types of organizational environments do or do not facilitate individuals to learn in apprenticeship schemes in modern work settings. Another approach is the social-cognitive tradition represented by Eraut. He has drawn on Reber's ideas about the structure of 'memory' and Polanyi's ideas

[1] TLM looks at inclusion in the creative industries in the following regions in the UK: Cumbria, London, Birmingham, Manchester, Sheffield, Slough, with special reference to the black and minority ethnic population. TLM focuses on aspirant and recent entrants' experiences of access and learning and development in the creative industries, as well as on the experience of intermediary agencies such as City Councils, who coordinate programmes for those entrants.

about ‘tacit knowledge’ to identify the cognitive processes and organizational factors which facilitate the transfer of knowledge from education to workplaces (Eraut, 2003; 2004). A further approach is Engeström’s (1987; 2001) work in the field of Cultural-Historical Activity Theory (CHAT). He has formulated a continuous stream of new concepts over the last few years such as ‘activity system’, ‘boundary crossing’ and the ‘cycle of expansive learning’ to analyse the transformation of work and learning in different settings.

Work placements have a long history as a strategy to facilitate the development of vocational practice in most European countries and for that matter elsewhere in the world (Griffith & Guile, 2004). This is because the forms of knowledge, skill and judgement characteristic of vocational practice are best developed in the workplace as people mediate the general principles, which they have learnt in education, in relation to the specifics of actual practice-based situations (Guile & Okumoto, forthcoming). It is widely accepted therefore that the field of workplace learning, with its focus on the processes that facilitate learning at work, is ideally suited to the analysis of vocational practice (Evans et al, 2002; Evans et al, 2006; Rainbird et al, 2004). The aim of a work placement is usually to provide a novice with an opportunity to develop their vocational practice by participating in the well established procedures, protocols associated with a specific field. The type of work placement described in this paper, however, is rather different in two senses: it has to be specially designed and embedded in a company; and, it had to develop newly qualified designer’s vocational practice and participating companies’ product and/or service range.

We acknowledge the significant contributions that the aforementioned writers have made to the analysis of workplace learning. Nevertheless, given that Billett, Eraut, Fuller and Unwin’s concepts are primarily concerned with the analysis of existing processes and environments, which enable individuals to acquire or modify known forms of knowledge and skill rather than on the introduction of new working and learning arrangements in work placements, they did not appear to be completely compatible with the focus of our research. Neither did Engeström’s (2001) theory of expansive learning because the methodology associated with his theory presupposes the establishment of a ‘boundary crossing laboratory’ inside an organisation, where a cross-section of the workforce collaboratively re-think the ‘object of activity’ (i.e. that which is to be realized) and re-design the organisation’s community, rules and division of labour so as to realize the new object, and this requirement fell outside the remit for both the work placement and the research.

We are nevertheless interested in using the concept of the object of activity, which lies at the heart of Engeström’s work, as a way of analyzing the way in which the participating parties agree the focus of, the process of, and the outcome from learning through work placements for companies and individuals. This has led us to turn to other recent work in CHAT specifically, the work of Hyysalo (2005) who has elaborated the concept of the object of activity with his notion of the ‘project-object’. The project-object serves as a bridge between the motive for the overarching goal of an activity and the actions required to realize that goal, thus, it allows Hyyaslo to provide a multifaceted analysis of the

formulation (i.e. figuring out) and the instantiation (i.e. the steps to realize) of a new product or service. In the case of the work placement scheme discussed in this paper, we use the notion of the project-object to consider the relation between the contribution of individuals and organizations to the creation of a new range of jewelry.

What remains relatively underdeveloped in Hyysalo's work, however, are any concepts to define the nature of workplace expertise or to explain how the various kinds of material entities, skills, and social functions are built into the project-object in such a way that they are aligned and coordinated so as to make it functionally coherent and representative of all parties' desires and interests. For this reason, we have turned to the concepts of 'vocational practice' (Guile, forthcoming), that is, the mix of knowledge, skill and judgement, and 'workplace pedagogic practice' (Guile, 2007), that is, the ability to make what is implicit in a practice explicit to others. The gist of our argument is that it is only when people can infer what follows from advice, suggestions and so forth, that they are unable to incorporate others' ideas into a unified learning and working and process. Taken together, these concepts enable us to offer a different angle on the individual and organizational activities that facilitated the production of a new range of jewelry compared with the current dominant theoretical and methodological approaches in the field of workplace learning.

3. The development of a work placement scheme in the jewelry industry

3*.1. The role of intermediary agencies*

The idea that greater education/industry links are required to improve economic performance and support recently qualified graduates to supplement their qualifications by developing the forms of vocational expertise firms require is not entirely new in the UK. In recognition of this dual need, the Teaching Company Scheme (TCS) was set up in 1975 (Senker & Senker, 1994). The TCS was intended to counteract shortcomings in engineering formation at post-graduate level by providing opportunities for academics in universities to work with companies to:

1 facilitate the transfer of technology and the spread of technical and management skills, and to encourage industrial investment in training, research and development;
2 provide industry based training, supervised jointly by academic and industrial staff, for young graduates intending to pursue careers in industry;
3 enhance the levels of academic research and training relevant to business by stimulating collaborative research and development projects and forging lasting partnerships between academia and business.

The focus of the TCS has subsequently been broadened to reflect the Government's desire to support UK companies in all industrial sectors to compete successfully in the global knowledge economy, and it was renamed the Knowledge Transfer Partnerships (KTPs) scheme in 2003 to reflect this broader goal (Momenta, 2007).

It is much easier to establish national schemes like the KTS in industrial sectors such as engineering, finance, pharmaceuticals which are characterised by, on the one hand, a mix of multinational and large-scale national companies; and, on the other hand, the 'traditional value chain' of partnerships and strategic alliances within firms (Porter, 1990). The long-standing relationship between higher education and the engineering, finance and pharmaceutical industries makes it relatively easy to persuade companies to participate in such schemes.

The jewelry industry, which is part of the creative and cultural sector, presents a very different kind of challenge. Much of this sector depends upon a value network of 'horizontal' collaboration between small and medium size enterprises (SMEs) and freelancers who create new products and services and 'vertical' collaboration between large firms who act as suppliers and distributors (Bilton, 2006, p. 54). This generates a very different pattern of economic activity based on 'local ties' where SMEs and freelancers are committed to the creation of new jewelry products and the larger firms are concerned with their manufacture and distribution. Government intervention in such contexts, if it occurs, is difficult because policy measures rarely articulate with the actual needs of the relatively invisible SMEs and/or local agencies that serve the needs of jewelry industry.

One of the most effective strategies for fostering education-industry collaboration in the creative and cultural sector is to work through 'intermediary agencies' (Guile & Okumoto, forthcoming). They are the range of local private and/or public sector organizations that act as catalysts to bring SMEs, freelancers and networks together to forge partnerships. They can include amongst others: local council's departments of economic development and social regeneration, sector-specific-funded agencies with a remit for brokering cross-sectoral partnerships, and SMEs who specialize in project development. The next section describes the work of a number of intermediary agencies and the work placement scheme that they established.

3.2. Birmingham City Council's Design Work Placement Project

Birmingham City Council (2007) has identified 'inclusive economic regeneration' as one of city's key agendas. Particular emphasis has been placed on increasing the number of the 'under-represented' sections of the community in the labour market. In order to engage with the invisible infrastructure of the creative and cultural sector in the city, the City Council established a Creative Team (CT) within the Department of Economic Development. The CT's role was to broker partnerships within the sector to test and promote new means of combating discrimination and fostering economic development, and to identify sources of funding to realize such partnerships aims and ambitions (BCC, 2007).

Birmingham's Jewelry Quarter was one of the priority areas identified in BCC's *Creative City Report* (BCC, 2003) because although the jewelry industry had historically been a mainstay of the local economy, it was for a number of reasons now in decline. They can be summarised as follows:

- many companies are struggling to compete with Asian manufacturers who are able to produce similar range of jewellery products at a cheaper price (Gay Penford, Manager, JIIC, interview, 4-11-05);
- the split structure of UK's jewelry industry – firms specialising in purchasing or retailing jewelry – obstructs growth because the former are inclined to buy vast quantities of standardized products, with the result that shops tend to have the same line (Gay Penford, interview, 4-11-05);
- jewelry companies are suspicious of graduates because they feel that they 'are not yet suitable for the workplace because they lack experience', while many graduates feel that 'manufacturing is second to designing' (Gay Penford, interview, 4-11-05).

To support Birmingham's jewelry industry to reposition itself in the domestic and overseas marketplace and young jewelers to develop their vocational practice, the CT worked in partnership with the Jewelry Industry Innovation Centre (JIIC) - part of the University of Central England, Birmingham, with a remit to provide support in research and development in the UK jewelry industry - and with whom the CT had a close working relationship. The JIIC had extensive experience of designing placement schemes, consequently, the CT felt confident about delegating responsibility for designing and managing the new scheme – the Design Work Placement Project – which was funded via the EU Programme EQUAL, trusting the JIIC to involve appropriate companies and graduate jewelers in the scheme.

One of the attractions of this source of funding is that it is unencumbered by UK government targets for education and training, therefore, it enables partners to co-configure work placement schemes according to their needs, rather than as a means to realize externally imposed targets (Gay Penford, interview, 4-11-05; Sylvia Broadley, Project Director, CT, interview, 28-11-06). The Design Work Placement Project was based on a 'three-way partnership' where manufacturers were prepared to give recently qualified jewelers an opportunity to develop a new range of commercial products based on their research because they had faith in the JIIC's track record in identifying new talent, recently qualified jewelers were prepared to work for a small bursary in order to learn how to incubate (i.e. create, cost and monitor the fabrication of their designs) because they appreciated that this would provide an invaluable opportunity to develop their vocational practice and to develop a profile within the sector, and the JIIC were prepared to act as mentors for the jewelers and as project managers because they understand that working and learning are a single integrated strand of activity rather than two separate and disconnected activities (Gay Penford, interview, 4-11-05). The scheme ran for six months and involved 10 companies and 10 designers (Kate Thorley, Project Manager, JIIC, interview, 10-5-07). The CT and JIIC felt that this provided sufficient time for the design (i.e. formulation of the project-object) and production (i.e. instantiation of the project-object) phases to occur.

The scheme was explicitly designed in the following way to integrate individual and

organizational workplace learning. The conventional business model that had been a feature of the jewelry industry for years based on leading manufacturers identifying trends and products on the basis of intuition, for example, 'I think pearls will be the trend this year' and expecting the remainder of the industry to follow, was replaced with a 'research-based model' (Gay Penford, interview, 4-11-05). This model was predicated on the idea that the designers participating in the scheme, supported by the JIIC, should try to foresee trends by identifying creative and cultural preferences that were emerging across the entire sector, and then to incubate these preferences into new jewelry designs, by work closely with manufacturers to feed their research findings into their design and production process, so as to help companies to move their product range up-market.

To achieve this goal, newly qualified designers were offered: (i) access to a programme of support to undertake and apply their research. The JIIC Project Managers guided the jewelers through the research process, assisted them to translate their ideas for designs into commercially viable designs, and convened monthly three-way meeting between the designer, the company and the JIIC to iron out any problems (Kate Thorley & Zoe Youngman, Project Managers, JIIC, interview, 4-11-05); (ii) in-company mentoring to ensure that emerging designs combined creativity and practicality. Directors of the participating companies acted as on on-site mentors for each designer by giving support and advice as regards the advantages and disadvantages of fabricating different designs and liaising with retailers to ensure that the designs were purchased; and (iii) an opportunity to showcase their new designs to the local industry at the end of the project. Participating companies were offered a way to foster a new designer-manufacturer-buyer relationship so as to enable fresh British research-based designs to set new domestic and global jewelry trends (Gay Penford, Kate Thorley & Zoe Youngman, interview, 4-11-05).

4. Methodology

Data for this study was collected primarily through semi-structured interviews and attendance at Mentoring Sessions, supplemented by phonecalls and emails whenever clarification was required. During the research period between November 2005 and May 2007, with an intermediary agency, the Jewelry Industry Innovation Centre (JIIC), three interviews were undertaken at the beginning, middle and final stages of the project. Three Mentoring Sessions in which the new jewellery designer, the Director of the jewelry company that hosted the designer and the Project Manager of JIIC attended were attended. After each session, interviews with the designer and also with the Project Manager were conducted separately. For triangulation purposes, two interviews were undertaken with the Project Director, Birmingham CT, the other intermediary agency. The role of these intermediary agencies will be discussed in the later section. All interviews were recorded, summarised and analysed thematically. One workplace observation was undertaken after the first Mentoring Session.

5. The development of vocational practice in the jewelry industry

5.1. Incubation as a strategy to formulate and instantiate new jewelry designs

One of the work placements negotiated by the JIIC was between M&M and a recently qualified jewelry graduate, Shona Marsh. M&M were keen to participate because the Director, Matthew Twigge, wanted to reposition the company at the 'high-end' of the UK and global jewelry marketplace. Shona was selected by the JIIC because she had a first degree in Tapestry from Edinburgh College of Art, a High National Diploma (HND) in Jewelry and Silversmithing from Birmingham School of Jewelry (University of Central England) and had also undertaken a work placement whilst at college. Consequently, the JIIC felt that Shona had the right balance between theoretical knowledge, practical skill and some experience of the challenge of working in a commercial environment to benefit from the placement.

The aim of the work placement was two-fold: to design a new range of female and male wedding rings (hereafter project object) to reposition M&M at the high-end of UK and global jewelry marketplace, and to assist Shona to develop her vocational practice so as to make the transition from unemployed to employed status (i.e. full-time employment or part-time/contract-based employment) in the jewelry industry. The work placement was, according to Kate Thorley (Interview, 10-5-07), 'unique' because, there were very few companies that were prepared to offer an inexperienced designer the opportunity to 'experiment with new designs based on diamond setting for wedding rings'. M&M were prepared to do so because the company was committed to increasing its profitability by offering an enhanced product range to appeal to the 'middle to the upper end of the market' (Matthew Twigge, 4th Mentoring Session, 7-2-06).

This work placement was also, according to Kate (Interview, 10-5-07), very 'focused'. The JIIC, Matthew Twigge and Shona were all collectively involved from the outset in agreeing a brief for the project-object, a written plan that outlined the timeframe, the expected number of designs and the forms of support, that is, regular meetings between Shona and Matthew to discuss ideas for designs and mentor meetings between Shona and Kate to discuss progress. Based on their previous experiences, the JIIC was acutely aware that this degree of clarity and transparency about the project's outcomes created a context where all parties were all collectively involved in the realization of the project-object and, as a result, more prepared to listen and learn from one another.

During the formulation phase**,** Kate suggested to Shona that she should change her working methods. Up to now, Shona had 'researched' new ideas by collecting images, almost randomly, in scrapbooks. This method of working was, however, rather insular because it did not allow her to identify general design trends in fields other than jewelry or to consider their implications for new jewelry designs. This is increasingly important aspect of modern

jewelry design because designs are expected to anticipate and complement rather than clash with fashion trends across the age range. Kate introduced Shona to the idea of 'moodboards' based on themes such as 'monotone' and 'Victorian' that reflect emerging fashion trends. Shona collated the sources of inspiration gleaned from shop displays, films and magazines during the research process on moodboards, and used them as a backdrop for the formulation of her initial designs for the wedding rings' designs, colours and shapes. Once Shona had produced a sufficient range of moodboards to stimulate a discussion, Matthew was invited to look at them and to select the themes and images that would like to see developed further. At this stage, feedback was still fairly provisional. Matthew identified promising ideas worthy of further development.

The transition from the formulation to the instantiation phase took an iterative path. Following the discussion with Matthew, Shona produced the initial rough hand-sketching of between thirty and forty rings to allow Matthew to exercise his judgement as regards which sketches were realistic in terms of their design (e.g. shape, size, complexity), appropriate as a commercial product, and most importantly, deemed to be 'new' in the market. Having received Matthew's subsequent feedback on the commercial potential and practical feasibility and of the themes and ideas for designs, Shona then made detailed sketches of the designs, including their measurement and scale.

This proved to be very demanding because whereas at college Shona had six months to come up with one design, at M&M she had to produce a total of forty-two designs within the same period. As Shona remarked:

> the learning curve is to design at a much quicker pace. . . . I didn't feel pressure but felt it was a different way of working (Interview, 5-4-06).

In the past, Shona pondered over ideas for hours, however, given her new production schedule this was totally un-realistic way of proceeding. The key challenge that she now faced was to produce a far greater quantity of designs in a very short timeframe. At college, whereas Kate introduced Shona to a new approach to design based on the principle of 'pinning ideas down' quickly, in other words, drafting them from different angles and perspectives and producing slightly different versions of each design. This process allowed her to not only clearly explain the idea behind a design to Matthew so that she and Mathew could consider their aesthetic originality, but also to explain the design's idea to Tuwet Baht, the model-maker, to enable him to swiftly consider the technical implications of each design and offer Matthew and Shona immediate feedback on their practicality and cost implications (Shona Marsh, interview, 5-4-06). Once all three parties had agreed which designs would be instantiated, Shona produced very detailed final drawings for each design so that Tuwet and his team could easily fabricate them.

The fabrication process also proved to be another particularly demanding challenge. Shona

had acquired some knowledge of production methods and learnt a number of casting techniques at college. These proved to be particularly valuable during the work placement at M&M because, in conjunction with the new methods of working that Kate had introduced her to and listening to Tuwet's feedback, Shona began to ascertain for herself, at an increasingly early stage in the design process, the practical difficulties and cost implications of realizing particular designs. This allowed Shona to develop her own judgement and to eliminate, at the drafting stage, designs that would be difficult to make 'downstairs' in the factory or that were too expensive, even though she might be deeply attached to them, without having to consult Tuwet (Shona Marsh, interview, 8-3-06). Once the models had been completed and fine-tuned to reflect further aesthetic considerations that emerged in her meetings with Matthew and potential technical difficulties identified by Tuwet, Shona could confidently send them to be fabricated in the knowledge that she was not wasting precious time and resources in the factory (Shona Marsh, interview, 10-5-07).

5.2. Outcomes of incubation

The Design Work Placement Project was deemed by all partners to be a great success. Shona felt that she has considerably improved her vocational practice as a result of undertaking the work placement.

> I've learnt how to monitor the production process so as to ascertain at the model making stage whether designs are being realised so they're consistent with my original intentions……, to correct any deviations from the original design in the models and …. to monitor the final stages of fabrication (Shona Marsh, interview, 8-3-06).

Moreover, the opportunity to work with a number of precious materials was not only an invaluable experience, but also a stepping-stone for her to progress to the next stage as a designer because as, Kate explains, a jeweler's perception of the actual working materials is 'a really big thing' in the design process since it is a major stepping stone to a designer developing their own style:

> If Shona is to do a bespoke design now, she knows what kind of questions she should ask – e.g. what kind of rings the client wears with – to identify the client's needs. She is much more aware of how things have to be made (Kate Thorley, interview, 5-4-06).

Furthermore, because 'M&M allowed me to work more freely', Shona not only significantly broaden her experience and increased her confidence, but also began to rethink her career trajectory as a jewelry designer. Instead of searching for security and seeking a permanent position with a jewelry manufacturer, she was now keen to develop a professional identity and profile as a freelance designer by consecrating a reputation in the industry as someone who has 'developed their own style' (Shona Marsh, 6th Mentoring

Session, 5-4-06)[2].

M&M were also enormously pleased with the work placement scheme. Before participating, Matthew was responsible for designing all the products as well as running the business as a result the quantity and quality of his design work was variable. The scheme, nevertheless, was a real challenge for M&M. It entailed the company re-configuring aspects of their work processes so that Matthew, Tuwet and the front-line workers in the factory worked collaboratively with Shona to formulate and instantiate the new range of designs. Fortunately, Matthew was very relaxed about the project appreciating that:

> You have to try a new thing and if you do something new, sometimes it goes well and sometimes it doesn't. . . . the trick is not to take it so seriously. . . . I can be like this because it is my company and my money (Interview, 5-4-06).

He recognized that the introduction of the new work processes had significantly developed the capability and capacity of his staff to fabricate new designs, and anticipated there would be a number of spin-offs from the new designs over the next six to twelve months which would also benefit the company. This led him to offer Shona a freelance contract after the project had ended so that they could mutually benefit from their new working relationship (Interview, 5-4-06).

5. Vocational practice, pedagogic expertise and workplace learning

5.1. The epistemic basis of vocational and pedagogic practice in workplaces

Some years ago Engeström (1987, p. 1) argued that psychological theories of learning such as cognitivism and constructivism had little to offer as regard supporting people to learn to create new artefacts and practices because they were essentially 'reactive forms of learning'. Their roots in formal education meant that they presupposed a given context and a pre-set learning task; as such, they were predicated on a view of learning that assumes we 'cope with tasks *given* to us'. He argued that his theory of expansive learning offered people a way escape from this trap by positioning them to rethink the purpose of their activity and to envisage and implement those new forms of activity.

He has subsequently applied the gist of his original critique of mainstream theories of learning to the field of workplace learning by arguing that 'situated' and 'practice-based' theories of learning, which as we saw earlier has been a significant influence in this field, are more suited to analysing incremental change in artifacts and practice, rather than analyzing the radical changes that are frequently required in modern workplaces (Engeström et al, 1999; Engeström, 2004). In contrast to Engeström's polarization, we have

[2] After finishing this scheme, Shona took part in a new scheme 'Design Space' for a year. This scheme is run by the BCC to promote freelance designers to the local jewelry industry, as Kate pointed out, 'this funded project will help her to further build up her confidence (Interview, 5-4-06)'.

sought to develop an intermediate position between the 'gradualistic' and 'radical' perspectives on workplace learning. The cornerstone of our approach is the way in which we have used the notion of the project-object as a unit of analysis to identify the individual and organizational contribution to workplace learning.

This has allowed us to first, reveal the epistemic basis of vocational practices. The conventional conception of epistemic is the production of foundational knowledge within a disciplinary field in science or in the humanities, thus, restricting epistemic practice to those fields (Toulmin, 1972). The idea that the formulation and instantiation of a new artifact is a knowledge-based process introduces a rather different sense of epistemic compared with the traditional conception. One way of understanding this new conception is to turn to Knorr Cetina's (1999; 2001) argument about the spread of 'epistemic cultures' in advanced industrial societies. Knorr Cetina maintains that scientists' knowledge generating practices, for example, the accumulation, verification and distribution of knowledge to remediate practice are becoming a constitutive feature of other professions. Thus, from her perspective, in those occupations and organizations which have a significant knowledge base:

> one would expect practitioners to have to keep learning, and the specialists who develop the knowledge base to continually reinvent their own practices of acquiring knowledge, Practice, in this case, would seem to take on a wholly different set of meanings and raise a different set off questions from the ones raised by habitual activities (Knorr Cetina, 2001, p. 175).

Thus in this new context, the concept looses its strong teleological and foundational connotations, yet retains many of the features of knowledge-generation that have traditionally been associated with science, for example, a concern for the development of practice based on the spread of research-based methods of inquiry and research-based partnerships. In a nutshell, her argument is that those vocational practices which have an explicit knowledge base and are a part of a well defined field have a stronger epistemic root compared with those practices which are not characterized by such features and, moreover, that this root constitutes a key resource for their continuing development[3].

This conception of epistemic has allowed us to reveal the way in which the practices that Kate introduced Shona provided her with a resource that enabled her to not only formulate ideas and designs more effectively for a new range of jewelry for M&M, but also to appreciate the changing position of the jewelry industry within the creative and cultural sector. In the case of the former, Shona used the moodboards to reposition her in relation to the project-object. Instead of trying to self-generate designs by relying on her imagination, Shona injected a more explicit research-based dimension into her working methods so as to identify emerging fashion trends and to consider their implications for jewelry designs. The

[3] I would like to thank Reijo Miettinen, my discussant at a symposium on 'epistemic practice' at the Vth Nordic Socio-Cultural Activity Theory Conference, Oslo, 2007, for pointing out the problems of not fully clarifying the way in which the term epistemic practice was being deployed in a paper that I gave at the conference.

research process provided Shona with a space to consider the way in which her ideas for designs might be received in their context-of-consumption (i.e. the way in which customers would perceive them) as well as in their context-of-production (i.e. to anticipate how Mathew might respond to the ideas that lay behind different designs before she presented them to him).

In the case of the latter, the introduction of the research-based dimension led Shona to appreciate that the creative and cultural sector is increasingly less and less a series of separate and fragmented industries, and increasingly an interconnected field where aesthetic notions are shaped 'relationally' by the way in which people can creatively juxtapose ideas, artifacts and lifestyles (Bourriard, 2002). This alerted her to the dual challenge of consecrating a reputation as a jewelry designer in an era of economic innovation: it is imperative to not only search for inspiration for jewelry designs outside of the immediate field of practice, but also to consider the way in which those sources of influence might anticipate and, thus position companies such as M&M, to be at the forefront of fashion trends.

The second issue is to reveal the crucial role of pedagogic practice in developing the epistemic dimension of vocational practice in workplaces. Most discussions of workplace pedagogy have focused on: (i) the transition from novice-to-expert (Fuller & Unwin, 2003a); (ii) the enculturation into preset work processes (Billett, 2003; Eraut, 2004) and habitus (Casey, 1997); and, (iii) the conditions to facilitate interaction between different activity systems (Tuomi-Gröhn & Engeström, 2003). Once we focus on how various kinds of knowledge, material entities, skills, and social functions are built into a new project-object so that they are aligned and coordinated to make it functionally coherent and representative of all parties' desires and interests, we introduce a new dimension into workplace pedagogy that the gradualistic and radical positions have never addressed: how to support people to learn to infer what follows from other people's ideas and practices.

The traditional 'front-loaded' argument about the vocational educational curriculum stresses that such techniques and the theories that underpin their use should be taught to learners prior to encountering practical situations in the workplace where they may be relevant (Winch & Clarke, 2003; Winch, 2006). While the more recent 'practice-based' argument in vocational education has stressed that modern work is characterized by a need for 'hot actions' and that vocational curricula cannot possibly anticipate and prepare people for such situations (Beckett & Hager, 2002). The problem with this polarised view of the vocational curriculum is that both positions gloss over, albeit in slightly different way, that concepts and working practices are neither context-free nor purely situated achievements; they dwell in their own normative domain which is underpinned by culturally and historically constituted reasons. Thus it follows that in order to grasp the implications of any suggestion (i.e. to know that something either is the case or might be relevant to the case-in-hand), learners have to be able to discern what is or is not a reason for different suggestions, and to use their emerging knowledge of those reasons to infer what does or does not follow for their vocational practice.

The approach adopted in the Design Work Placement Project by the JIIC and M&M followed, even though it was not consciously based on, the above principles. The JIIC achieved this goal through a combination of, what can be referred to as, 'orientation' and 'laterally-branching' pedagogic strategies. The former consisted of workshops that were delivered prior to the jewelers participating in the scheme to alert them to the changing industrial context. The latter involved the introduction of new techniques in relation to the task-in-hand faced by each jeweler. Kate introduced the moodboard and pinning down strategies to Shona as heuristic devises, rather than maxims, and invited her to consider how and/or whether to incorporate those techniques into her own practice. Shona progressively recontextualised her use of those techniques so she was able formulate and instantiate a new range of wedding rings that exhibited some continuity with traditional designs whilst simultaneously introducing new design elements into what is a fairly staid artefact.

M&M achieved the above goal through the creation of, what can be referred to as, 'workflow' pedagogic process. Matthew accepted responsibility for the creation of a context in the meetings between Shona, Tuget and himself whereby aesthetic, commercial and fabrication issues associated with different designs could be discussed so that all parties were able to infer from one another's comments what followed for their practice, and use this growing knowledge to anticipate potential problems with the next round of designs.

7. Conclusion

The paper has made a number of inter-related arguments. The first argument is that qualifications are not the magic bullet that facilitates access to the creative and cultural sector because the industry is under pressure to innovate, and newly qualified graduates in any field have not yet developed the forms of vocational practice to contribute meaningfully to the process of innovation. The second argument is that intermediary agencies play a vital role in supporting newly qualified graduates to develop the forms of vocational practice that will assist them to gain access to the creative and cultural sector and firms in the sector to transform their product and service strategy, by creating the conditions for both parties to incubate new products and services. The third argument is that the link between access and innovation present a particular challenge to existing gradualisitic and radical approaches to workplace learning because neither are geared to the analysis of the formulation and instantiation of new products and services.

The paper has approached this task conceptually by drawing on the concepts of the project-object, vocational practice and pedagogic practice, and substantively by focusing on the formulation and instantiation of a new range of jewelry. This conceptual framework has allowed us to not only identify the way in which the interplay between the epistemic dimension of vocational practice and the pedagogic strategies and tactics enable individuals and organisations to build knowledge, material entities, skills, and social functions into a new artefact, but also to shed new light on individual and organisational contributions to workplace learning. In the case of the latter issue, our analysis of the formulation and instantiation of the project-object reveals that individuals and organisations are only able to

successfully work and learn together as they grasp the system of mediating connections that inform one another's concepts, practices and judgements. We have shown that in order to accomplishing this goal there has to be a collective determination on behalf of all contributing parties to make explicit to one another what is implicit in their beliefs and actions. It is only as all contributors involved with the creation of the new artefact begin to grasp the inferential connections that inform one another's utterances, symbolic representation or actions that those utterances etc become intelligible in two senses: first, their meaning becomes clearer thereby enabling all parties to infer what follows from them; and second, they are able to use their understanding of these inferences as a resource to create new practices to instantiate the new artefact. In doing so, the paper has highlighted a new issue that requires further consideration and exploration.

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