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Making Sense of Education: Sensory Ethnography and Visual Impairment¹

Education involves the engagement of the full range of the senses in the accomplishment of tasks and the learning of knowledge and skills. However both in pedagogical practices and in the process of educational research, there has been a tendency to privilege the visual. To explore these issues, detailed sensory ethnographic fieldwork was conducted in further education colleges, investigating the experiences of visually impaired students who use their non-visual senses and embodied actions to achieve their learning. The study found that the full sensory schemas of the students were not always appreciated or accessed by tutors, resulting in lost learning opportunities. Whilst particularly relevant for visually impaired students, these findings have implications for pedagogy for all students. Further the study highlighted the significance of sensory ethnography as a tool to explore the processes of teaching and learning.

Keywords: visual impairment; further education; sensory ethnography; senses; pedagogy

Introduction

There is a growing emphasis on sensory ethnography, and the sociology and anthropology of the senses have developed significantly in recent years. There remains, however, a need for ethnographers to more fully explore the sensory aspects of culture and organisation, and the impact of the full range of the senses on interactions between people, spaces and places. In addition, the processes of teaching and learning require the engagement of the full range of the senses in the accomplishment of tasks. This paper will explore both the value of sensory ethnography in educational research, and the significance of the senses to the processes of teaching and learning.

In terms of research, too much of what passes for sensory ethnography in practice privileges visual methods and visual phenomena. Many of the studies proposing sensory ethnography utilise the dominant visual model, which actually inhibits sensory analysis (see, for example Pink 2011a; 2011b and Pink and Macklay 2012). This ocularcentrism denies the significance of other sensory modes, whether auditory, tactile, olfactory or kinaesthetic, for

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example. Further, the synaesthesia of the senses and the 'unique sensory schemas' of individuals have failed to be adequately explored, which is particularly relevant to any analysis of the life-worlds of people with a sensory impairment. The purpose of any ethnography is to understand how people accomplish their everyday lives. In paying attention to the senses, we are acknowledging that mind-body dualisms fail to capture the complex realities of embodied human everyday experience, and the interactions of the self with the social world (Williams and Bendelow 1998). We experience the world through 'the whole body at once' (Merleau-Ponty 1962, 225), and sensation is more than a biological process; it is also a social process. (Vannini et al. 2012, 4).

In terms of the process of education, the exploration of sensory cultures and practices can provide a depth of understanding of the processes of teaching and learning. Schools and other educational institutions are involved in bodily control and have particular cultures with 'specific techniques of the body' (Shilling 2003, 23). In recent years visually-orientated teaching techniques have been increasingly emphasised, through PowerPoint and other forms of technology-enhanced learning. These methods fail to recognise the embodied multi-sensory nature of the learning experience. An investigation into non-visual teaching and learning is thus long overdue. The experience of visually impaired students was thus of particular relevance to an exploration of these issues.

Detailed sensory ethnographic fieldwork was completed as six case studies of visually impaired students, aged between 16-25 years, in three further education institutions in Wales. Further education colleges in the UK provide academic qualifications and vocational training for students at post-compulsory age, that is, above sixteen years. In considering education, it was evident that for the discrete set of learners who are visually impaired, teaching and learning present a distinct set of challenges in terms of sensory inclusion. Conversely, for the post-compulsory education sector, visually impaired learners present a range of unique needs relating to pedagogy, organisation, management and environmental factors. These arise in relation to communication of information, learning processes and safe and successful negotiation of the learning environment. There are two primary models for the education of visually impaired students in further education in the UK. Firstly students may attend a specialist college for visually impaired people, which is usually residential and provides tailored teaching and learning, often with additional skills teaching in learning to live independently. Secondly students may attend a local mainstream college, where they receive an assessment of needs, and are then provided with equipment (such as suitable adaptive

technology) and/or human support in the form of support workers, who may sit in lessons to take notes or support with practical tasks.

Sensory ethnographic observation of actions and interactions in learning and social contexts was conducted in each location. Interviews were also completed with visually impaired students, which focussed on their sensory constructs, educational 'life histories' and their perceptions of barriers to learning and good practice in educational settings. These were supplemented with interviews with others involved in the learning process, including managers, teachers and peers, and with documentary analysis.

In a 'call to arms' to ethnographers, Atkinson et al. (2008, 203) argued that consideration of the sensory nature of the social world is under-developed in ethnographic research:

There is, in other words, an abiding need for the sensual exploration of social worlds... Visual and sensory cultures are themselves among the most important *forms* of culture and *modes* of social action.

In order to address this gap in the literature, in this paper I will firstly discuss the significance of our increasingly visually-orientated society, what Ede (2009) terms 'the hegemony of the eye'. I will then argue for, and exemplify, a developed ethnography of the senses which explores the unique perceptual schemas of individuals, and the socially emplaced nature of sensory perception. I will also illuminate how sensory ethnography can be utilised in educational research, giving attention to the full range of senses of the participants, and the sensory affordances of social spaces; in this case, the classrooms of further education colleges. Finally I will turn my attention to the value of attending to sensory pedagogy, examining how an attention to the senses yielded valuable data on the sensorial practices of teaching and learning, disability support and social relationships.

The 'Hegemony of the Eye'

From an early age, children are taught about the five senses; sight, hearing, touch, smell and taste. This 'common sense' and rather basic understanding of the mechanisms of sensory perception informs the cultural conceptualisations of our embodied interactions with the social and physical world. Notions of sensory perception have been challenged by scholars in a number of disciplines, who question 'empiricist understandings' (Millar 1994,18) of the senses.

Sociological and anthropological approaches have increasingly elaborated upon theories of sensory perception. In 1991 Howes, working in the field of the anthropology of the senses, was the first to propose anthropological comparison of the varying hierarchies of the senses in a range of different cultures (Howes and Classen 1991). A number of studies have examined the social, cultural and identity roles of the individual senses. Smell, for example, is related to 'every aspect of culture, from the construction of personal identity and the defining of social status to the confirming of group affiliation and the transmission of tradition' (Drobnick 2006, 1). Similarly tactile interactions are integral to social life, and touch and movement are closely integrated, as 'touch in motion' (Classen 2005: 1). In addition, authors such as Ball and Back (2003) suggested that hearing and sound have been neglected in the social sciences, and that it is essential to interrogate the role of sound in the everyday. It has been found that in a range of cultures across the world, senses other than vision can be culturally more significant (Howes 2003). Thus the 'common sense' notion of visual primacy and the modern Western state of 'hypervisualism' and occularcentrism have been challenged by anthropological studies of sensory culture. The visual focus of society is thus a result of cultural conditioning rather than a biological fact of visual dominance.

However, whilst appreciation of the range of cultural uses of each the senses may have dawned in anthropology and ethnography, the 'hegemony of the eye' (Ede 2009, 62) is still privileged in post-Enlightenment Western culture, and in ethnographic research. Since the Age of Enlightenment, science has privileged the visual, as measurement of 'the seen' is believed by scientists to reduce subjectivity. Ede stated that this 'European intellectual sensory model' (2009, 64) has a distinct hierarchy of the senses with vision at its pinnacle; an occularcentrism which creates and reinforces social hierarchy.

A more integrated approach to the senses is required. Millar (1994) drew on psychological studies undertaken with two groups of children, one group blind from birth and one group sighted. She found that a congenital lack of sight results in more body-centred and movement processes than those measured for sighted children. Most importantly, Millar discovered that whilst the overlap of information from available sensory sources was differently formulated, it resulted in a comprehensive alternative schema of sensory information absorption. This supports the phenomenological perspective of scholars from other disciplines. Merleau-Ponty is a well-known example, arguing powerfully some fifty years ago that 'we encounter the world through the whole body at once' (1962, 225). This

approach was expanded some years later by a visually impaired researcher, Saerberg (2010), who asserted that each individual, whether sighted or visually impaired, has a 'particular style of perception' (2010, 370). Similarly Ingold (2000) challenged the early anthropological cross-cultural approaches to the separate senses, suggesting that the separation of sensory modalities did not sufficiently acknowledge the fully integrated and embodied experiences and knowledges of individuals in the social world. There is a need to further explore the significance of individual perceptual schema in a range of social spaces. Whilst authors such as Pink (2009; 2011) have argued for a sensory anthropology which informs ethnographic practice, much of the primary research work in this field privileges visual methods.

It is evident that although viewpoints may vary, social scientific conceptualisations of sensation and perception, and their role in social life have significance for a study of visual impairment, particularly when contentions of visual primacy in modern culture are explored. The cultural predominance of vision obviously has significant implications for visually impaired people, in terms of hierarchical placement, social understanding and power. Within education, the predominance of vision and visual representation as a mode for the transmission of information has significant repercussions for visually impaired students. Pedagogical practices which privilege the visual, whether through PowerPoint presentation, physical demonstration, or diagrammatic representation, disadvantage the visually impaired learner. The Western emphasis on the visual, as a form of 'sensory socialisation' (Vannini et al. 2012, 49) may also have an increasingly significant impact on *all* learners, if the full range of sensory schemas (as modes for learning) are not acknowledged.

An Ethnography of the Senses and Sensory Ethnography

The fieldwork in further education colleges resulted in an ethnography of the senses, in that it was an exploration of the role of the senses in everyday practices in educational settings. It also utilised sensory ethnography by privileging attention to the 'sense-making' of students in the processes of learning with their unique sensory schemas. With Altheide and Johnson (2013), I see the research as positioned within a framework of 'analytical realism', informed by the basic assumption that 'the social world is an interpreted world, always under symbolic construction' (Altheide and Johnson 2013: 390). The validity of my analysis and interpretation is thus located within the reflexive accounting process. Consideration of the

experiences of people labelled as having a ‘sensory impairment’ necessitated an epistemological position and research method which interrogated perceptual interactions and ways of knowing of visually impaired people, and it was necessary to put sighted, culturally-derived meanings aside. It was essential to acknowledge the alternative sensory frameworks of the students, and to attempt to interrogate actions and interactions from the perspectives of the participants themselves. Critique of visually-orientated taken-for-granted meanings affords the researcher an opportunity to re-evaluate phenomena from an alternative perceptual framework, informed by the meaning-making of participants.

The use of sensory ethnography enabled a study of the impact of each individual’s style of perception on learning, interactions, and embodied performance in educational and social contexts. The attention to the senses in fieldwork observations and interviews necessitated a significant level of attention to the multi-sensorial nature of the environment and interactions, which this extract from field notes illustrates:

From the moment of arriving I became conscious of the change in pavement etiquette and the increased concentration needed when I was moving around. Many students with guide dogs and canes were negotiating walkways. The tactile paving was lumpy under my feet, and I became aware of these textured landmarks acting as way-finding for the key buildings of the college. Walking became self-conscious and significant, and I became aware I was scanning for eye contact as I approached each person, to assess their level of vision and the amount of movement I was likely to need to make to avoid collision. Long cane users were all heading for the smoking shelters as I arrived, during a break in lectures. The pungent odour reminded my body of its addiction, whilst I fought the urges, in my bid to maintain my professional demeanour. There was the resounding noise of white canes clashing as students made contact, with a ‘sorry mate’ or a ‘who’s that?’ before they relocated their tactile landmarks and continued on their routes, some jogging as the hour passed and lessons recommenced.

The sensorial nature of the fieldnotes thus enabled a depth analysis of how students experienced the college environment and interactions with others. Pink (2009) put forward an argument that is worth quoting in full:

By attending to the sensorality and materiality of other people’s ways of being in the world, we cannot directly access or share their personal, individual, biographical, shared or “collective” memories, experiences or imaginations...However we can by aligning our bodies, rhythms, tastes, ways of seeing and more with theirs, thus feel that we are similarly emplaced.

(Pink 2009, 40)

The extent to which this is achievable is open to debate, and whether a sighted researcher can feel ‘similarly emplaced’ to a visually impaired person could be questioned. Reflexive awareness of the interpretation of sensation and perception was particularly significant with

this form of ethnography. As such, we must be ‘open about...limitations and partiality’ in our ethnographic accounts (Spencer 2001, 450). Any attempt to provide an account of another’s ‘life-world’ must be honest in acknowledging its constructed nature, as ‘the simplest cultural accounts are intentional creations’ (Clifford and Marcus 1986, 10). In the case of the interpretation and representation of another’s perceptual schema, this is particularly relevant. However the intensive observations, coupled with explorations of each individual’s sensory constructs in interview and during daily practices, created a ‘bricolage’ (Denzin and Lincoln 1994, 3) of data from which aspects of sensory embodiment and practices could be explored. These interpretations were revisited with participants following the observations, and corrections made to the interpretations, where necessary. The level of depth also had an unexpected impact on my experience of research:

The concentration involved is immense - a constant attention to sounds, objects (and the students tactile interactions with them), smells, sights (both those perceived and not perceived by the students), how they use wind, and light, and sonic perception to negotiate the environment... it is sensory overload, and a new form of being in the world, Zen-like, paying attention to the minute wonders of everyday life.

An inductive, constructivist, comparative grounded theory approach to analysis was adopted (Charmaz 2002: 678). While some scholars, such as Miles et al. have suggested that ‘coding *is* the analysis’ (2014: 72), I favoured the proposition that this phase of analysis enables researchers ‘to use our codings and categories to think with’ (Coffey and Atkinson 1996: 49). The development of analytical memos during the coding process became the foundation of later, comparative analysis. Following this, comparative analysis between key codes was completed, across student, professional and institutional dimensions, and with a focus on codes which had suggested patterns, regularities or exceptions (Delamont 1992). A number of significant themes emerged which draw attention to both the pedagogical requirements of visually impaired students, and the role of the full range of senses in teaching and learning for *all* students.

Sensory Pedagogy

The use of sensory ethnography, outlined above, resulted in intensive investigation of the role of the senses in the processes of teaching and learning. In the following two sections,

‘pedagogic moments’ (van Manen 1991) from two topics, of sport and preparing food, will be utilised to explore the use of the senses in teaching and learning, and the relationships between the individual students and the contextualised practices of the colleges they attended. In sport, the particular affordances of auditory learning, embodied experiences and movement are considered. Food preparation lessons enabled an exploration of the significance of the senses, in particular tactility and touch, and the individual’s particular sensory schema, to the experience of teaching and learning.

Sport

Sports lessons present a range of challenges for visually impaired students. Verbal description and auditory learning, sensation, embodiment, movement and orientation are particularly relevant. Drawing on and illustrated by extracts from fieldnotes from sports lessons in two colleges, one specialist college for the visually impaired, (Ospley), and one mainstream college (Brinton) the following paragraphs will illustrate the intersection between verbal description and auditory learning, physical embodiment and movement, and the sensory needs of visually impaired people, such as John and Steven. John had recently had a significant reduction in his vision, aged fifteen, and as a result had begun to attend a specialist residential further education college for students with a visual impairment. Steven had a stable eye condition since birth, which resulted in reduced vision and attended a mainstream further education college.

In terms of tutor differentiation, a number of significant differences were noted between the two colleges, and also between the delivery of individual tutors within colleges. Firstly, as discussed above, there was a variety of understandings of the significance of precise verbal instruction and language, which had particular implications for the embodied actions of students in sports lessons. The Royal National Institute for the Blind, a national charitable organisation providing services, research and advice regarding visual impairment, provides simple guidance for the teaching of PE, including recommending ‘precise language with clear verbal descriptions and explanations’ (RNIB 2014, 6). However not all of the tutors in both colleges appeared to be aware of the necessity for this, or to have the skills to carry it out. In Ospley, the experienced coach, Mark, explained the significance of verbalisation, and typified it during lessons, as these fieldnotes from 16/4/13 suggested:

Mark: ‘It is all in the description, you have to really think about it, how you describe the moves in such a way as they follow and repeat what you are doing. I worry about what they

learn, what they are doing in mainstream. Are they actually following what is being demonstrated, if people are assuming you can see the demonstration?’

Mark described the calf stretch in depth: ‘Right foot in front of the other, touching, bend your back leg, straight front leg, bring your front toe up’ and repeated the same level of detail for the other side. During this there was very little discussion, or back chat, as students listened carefully to the instructions.

However his less experienced colleague, Max, frequently made sighted assumptions during descriptions, which were corrected by Mark:

The tutor next discussed tactical positioning during football play. Using a magnetic tactile board with players as movable pieces, Max explained: ‘He passes to him, he moves back there’. Mark corrected him: ‘The back player runs diagonally to the centre of the pitch to pick up the ball’

In Brinton, no alterations to language or description was made in order to include Steven in sports activities, and directions or advice for tutors on this aspect of pedagogy was absent from his personal development plan and from the instructions for tutors, which read ‘needs large print’ (Fieldnotes 22/2/13). The teaching was predominantly through visual demonstration, with inconsistent verbal descriptions occasionally used to support the activities:

As the tutor began to demonstrate the netball pass, Steven first turned his left ear towards the talker, and then as the noise increased, stepped backwards with his head down. He could not see or hear the presentation. When the other students began to mimic the move, Steven passed the ball to his partner, and then watched closely as his partner demonstrated the pass. His first pass didn’t follow the instructions given, and his friend corrected him, but he subsequently passed as had been instructed.

Steven compensated by watching his friends, or asking one of two close friends to demonstrate moves at close quarters after whole-class demonstrations had been completed. This use of peer support for learning was a risky strategy, as there could be misinterpretation of ‘teacher talk’ by peers, or peers could be unable to pass on information accurately in a format useful to the visually impaired student. However some tutors in Brinton *did* appear to be aware of the need for sufficient variation in language and description to meet Steven’s needs. Alison, a senior tutor in the department, supplemented most of her visual aids with verbal description during her theory lessons, although she seemed unaware that Steven could not access videos. This may have been due to Steven’s unwillingness to discuss his adaptations with tutors (Steven interview 5/3/13).

‘Tactile modelling’ (as it is known in the US: O’Connell et al. 2006) or ‘kinaesthesia’ as it is described by the RNIB (2014) was largely absent from all the observed lessons, apart

from during the blind football session in Ospley. Kinaesthesia is ‘manual guidance and movement of the body parts administered by an instructor’ (RNIB 2014, 5), which aids understanding of spatial concepts such as location, position, direction and distance.

O’Connell et al. (2006) found that kinaesthetic instructions are ‘effective methods of improving the motor skills and physical activities of students who are blind’ (O’Connell et al. 2006, 475). For the ‘blind football’ students, physical posture and movement, verbal communication, tactile contact, and orientation were all essential to sport, and to any independent motion. The combination of these non-visual teaching methods therefore addressed the full perceptual schemas of the students involved. In this session, the students were learning essential life skills, in terms of movement, and sensory orientation, in addition to sports techniques.

The tutor guided Jak to the end of the room, and tapped the end boardings to indicate to Jak his location. He then physically guided each student to their starting positions in turn, located them, and positioned their arms and legs for the starting pose. When the students had finished their kick they had to find their place at the back of the line, using sound echoes from the nearby wall to orientate. At times the line-up disintegrated, with all three students standing in different positions: ‘Now lads, you know the score, what’s important in blind football?’ Jak: ‘communication, orientation and positioning’. The tutor prompted ‘OK, we ready? Remember orientation – where are you? Where is the ball? Where is your partner? It’s one of the very most important aspects of the game’. The students called to one another constantly to assist location: ‘ready Jak?’ ‘yes, here’ ‘yes, Kyle’ ‘Bill’.

Embodiment and movement can be viewed in terms of its educational, spatial and sensory dimensions. For the sports students in this study there was a strongly defined difference between ‘moving’ times and ‘stationary’ times (Delamont and Galton 1986, 90), due to the particular affordances of the topic being taught, the students present and the power and control of the tutors and students. The theoretical sessions had an expectation of stasis, and these elements were realised in a variety of ways in different lessons across both colleges. The example of one anatomy and physiology lesson with the sports tutor, Dave (16/4/13, below) can serve to illustrate the intersection between movement and sensation for visually impaired students.

The anatomy and physiology lesson focussed on the nervous system, and was timetabled for an hour. There were eight students present, three with no vision, three with highly restricted vision, including John, and two who were able to read large print. The entirety of the teaching was completed through verbal explanation and questioning, without any forms of visual or tactile teaching aids. The students remained seated and still throughout, as any movement or discussion would have interrupted the other students’ ability to hear. In terms of positioning, movement and posture, the unique nature of the student group was realised through the embodiment of the visually impaired learners: none eye-contacted the tutor

during teaching; some listened with their heads down on the desk, and others turned away, with their ears towards the tutor, Dave.

Preparing Food

Pedagogic moments in cooking lessons provide useful illustrations of the sensory schemas employed by visually impaired students when learning (in particular in the use of tactility, touch, and odour) and the significance of an attention to the senses in teaching. The sensory affordances of food preparation can illustrate the learning of social and carnal practices. The practical accomplishment of food preparation tasks is achieved through sensory, embodied learning, rather than as a mental process (Perez 2011). The social nature of food practices are produced through the sharing of ‘tastes, smells and embodied culinary techniques’ (Walmsley 2005, 55), and, as Pink suggested, ‘ethnographic knowledge is produced through food practices’ (2008, 181). The cooking lessons with Ffion and Tom, illustrated below, enabled an analysis of the significance of the senses in a pedagogic environment suffused with sensory significance. Touch and texture, smell, and sound (including verbal descriptions by tutors) were of particular value in these contexts, as Ffion and Tom had particular restrictions in their ability to attend to the visual in learning food preparation techniques. Ffion attended Ospley, a specialist further education college for visually impaired students. She had been visually impaired since birth, and had a significant, deteriorating sight loss. Tom attended Weatherwell, a mainstream college, and had a recently acquired visual impairment resulting in some restrictions to his distance vision and perception of detail.

The sensory nature of the cooking environments was evident throughout all observations:

In one large room there were four full-sized kitchens. One student, Joel, was cooking chips, one was being introduced to the kitchen for the first time, and Ffion was making a chicken casserole in a slow cooker. The overlapping voices, bubbling and sizzling noises, and robotic chimes and instructions made for cacophony of sound. Across the room Ed was sat at the table, exploring an unplugged iron with his hands. The tutor said, ‘Find the hole at the top? You blub blub blub, put the water in here. Now, you’ve reached the dial there with your index finger, it is ridged, and its flat but it turns. On the flat turning dial you’ve got bump-ons, can you feel them? That’s it, you’ve got the one bump-on’ ‘what’s that for then?’ ‘one for warm, two is hotter, and three is for hard clothes, you know like jeans’. Ed: ‘you’re supposed to iron jeans?’

The morning session was ‘Kitchen Skills’ and the purpose was to prepare and weigh ingredients ready for an assessment the following day. The room was a large training kitchen, with six workstations, each with a chrome cooker, sink and equipment. These were highly polished and reflected the bright sunlight from the large windows, leaving light

bouncing across the surfaces. The students all wore whites; overcoats, aprons and hats, increasing the brightness of the room. As the assessment was for desserts, the sickly sweet aroma of flour, cocoa powder, butter and sugar filled the space. Tom was with Seth, using large print scales and large paper bags of flour and other ingredients to measure into slippery see-through plastic bags. They worked together for many of the items, for example, as they measured a spoon of baking powder, one held the spoon and the other sliced the top with a butter knife. Tom sniffed each large bag to identify the contents, and did not attempt to read the indistinct labels.

The sessions described above have different purposes: Ffion is learning 'Independent Living Skills' for her future domestic life, which addresses the range of skills needed to live as an independent person, and may include cooking, cleaning, and household and financial management. Tom is learning industrial-scale food production, for a future career in catering. However it is evident that in each case the senses are central to any consideration of food preparation. Ffion had significantly reduced vision, while Tom, with his recently acquired visual condition, had the ability to use aspects of his sight to read and perceive the environment visually. However each relied upon their complete perceptual schema and embodied performances (crouching and stirring, for example) while learning to prepare food. Nonetheless differences were apparent in the extent of their reliance on alternatives to visual perception. When chopping vegetables, for example, Ffion relied on tactile methods, sifting chopped onions through her fingers to ensure evenness. Tom, on the other hand, tended to crouch to the work-surface to check his preparations visually. When frying her meat, Ffion used a combination of texture and smell to monitor cooking, scraping the surface of the chicken with her spoon to check its density: 'oh no, still slippery here' and sniffing 'that's getting good'. Ffion's access to the tactility of her environment was enhanced in other lessons, such as Braille, where touch is the dominant sense. Braille is a tactile form of communication comprising a series of raised dots which represent letters, or words, read by the finger.

Ffion firstly read the Braille aloud. Both fingers moved simultaneously across the page as her finger pads picked up the raised dots and she translated the tactile shapes into verbal letters and words. The tutor, who had explained she had no vision, touch-read the sentences in her own book concurrently. Ffion hesitated. The tutor said, 'If you are stuck, scan your whole word, and see what you can pick out' (although she used visual language, she was referring to tactile scanning and seeing, rather than visual). 'It's the troublesome 'T', if it is giving you trouble, it's a 'T'. Always go with your first thought, because your fingers are probably right'.

Tom was observed occasionally to employ tactile or olfactory methods, when checking the surface of toast, for example, or checking the ingredients as described above. However he still appeared to privilege 'seeing' in most of his food preparation techniques, which at times

resulted in lower achievement. For example, when he prepared vegetables in a later session, his visual levels were such that he did not perceive unevenly chopped products, which could be a disadvantage in a catering workplace in the future.

The variations in the students' sensory schemas and their employment of a range of senses were therefore evident in their approaches to learning. Similar variations in approach were apparent in the pedagogical approaches of the tutors, and their willingness or ability to encourage the use of the full range of sensory perception to prepare the food, and to adapt methods for the visually impaired student. Cooking demands a series of linked embodied actions, and the interaction of the perceiving body with tools and food items. The tasks of cooking, on a minute level, require an understanding of the moment of contact between the self and the products. Where presumed forms of visual perception are absent (for example in the presumptions inherent in instructions such as 'brown the meat' or 'cut the vegetables to a uniform size') alternative descriptions, such as the verbalisation of tactile, auditory or olfactory cues, are required to ensure accurate performance of the task. As in the example of Sport, above, demonstrations of embodied actions require precise verbal explanations of the performance required. However in addition, for cooking, there is a need for the tutor to understand the sensory affordances of the task, the sensory schemas of the student, and the possible alternatives to visual demonstration and visual conceptualisation of the activity.

During Ffion's cookery lesson, the tutor demonstrated her ability to conceptualise these sensory affordances from the viewpoint of Ffion's sensory schema:

Ffion was peeling and chopping vegetables. As she peeled the potato, she appeared to be attempting to use her vision to check the peel had been removed. Her eyes were two inches from the potato, head tilted sideways. The tutor said 'Now feel for it, instead, Ffion, systematically remember, top to bottom, swizzle it round, is it slippery all over?' She turned to me: 'Ffion is a whizz at peeling and chopping now'. Ffion tilted her head back and closed her eyes, as her hands explored the potato, top to bottom, twist, top to bottom. 'Yep, that's done'. Tutor 'Now the herbs, remember how?' Ffion sprinkled the oregano onto her palm, sniffed it, and felt it with her other hand, before sprinkling it into the slow cooker. Ffion then felt for the size of the chicken, rather than using her vision ('hate raw meat on me nose'), and began cutting it.

For Tom, however, it appeared that some of the tutors did not appear to understand the need for precise verbal explanations, or the potential for alternatives to a visually-orientated approach to the demonstration or performance of food-related tasks:

In the next session, Tom was practicing chopping and peeling techniques in the industrial kitchen. Pete came in and explained he wanted Tom to complete a series of tasks - chopping an onion, preparing a cabbage and performing three different cuts on carrots (roundel,

julienne and baton). He very rapidly demonstrated the techniques: 'see, like this, you chop down this way for baton'. He then left, and Tom said 'Did you get that? I've forgotten half of what he said'. He chopped the cabbage, leaving large chunks, and began on the onion, using a very large knife to slice towards his open palm. He crouched close to the board, appearing to have more difficulty with the onion as it was white on a white board. Ava, the kitchen tutor came over: 'That's no good, far too chunky, just do it like this'. She chopped the onion rapidly without verbal description, and then moved off. Tom: 'sometimes they don't explain it properly, and I have to ask them to see it again, or try to copy someone else, and get them to show me instead'.

Thus for Tom, the demands of the intersection between his individual sensory schema and the requirements of the task were such that the tutors needed the ability to adapt the teaching methods to Tom's sensory needs. Pink (2011) suggests that while it is impossible to fully appreciate another's perceptual schema, 'there are certain forms of knowledge that cannot be understood simply through observation', but require tutors to become 'apprentices in those sensory embodied skills' (Pink 2011, 271). Where alternatives to visual approaches to pedagogy were required, it was evident that while Tom was the learner in terms of catering skill development, the tutors required teaching in the conceptualisation of non-visual forms of task completion. As Tom was newly-diagnosed and had not received formal training from others with these pedagogical skills, he was unable to verbalise his needs in terms of pedagogical strategies, and very little learning appeared to have taken place.

Classrooms act as communities of practice, which 'call forth' disability as a result of the need for 'teachers and students to act in particular ways that are disabling' (Gaffney 2014, 359). In the case of cooking, for Tom, disability was 'called forth' through the visual teaching practices of the tutors, and the socio-cultural expectations of visual involvement in cooking. For Ffion, her socio-cultural environment privileged a range of sensory forms, and her disability was absent from the pedagogical process.

Discussion

In considering the findings, it became evident that there are theoretical, as well as research and pedagogical implications. There is a need to challenge 'traditional models for how we think about how we perceive' (Geurts 2002, 196). The use of sensory ethnography in this study paid close attention to the range of sensory schemas and their relevance to teaching and learning. It revealed the extent of visual dominance in teaching, and explored the alternative approaches, which privilege the full range of senses to facilitate access to learning.

Furthering Thomas' (1999) suggestion that disability can be viewed as the intersection between the self and society, the findings suggested that individual aspects of impairment, such as the sensory schemas of individuals, cannot be ignored in conceptualisations of disability. Given the levels of 'visual hegemony' (Ede 2009, 62) in modern society, and the lack of understanding of the varieties in vision and perception, visually impaired students are at particular risk of social oppression and discrimination as a result of their unique 'alternative sensory schemas'. While early conceptualisations of disability in the UK made by associations such as Union of the Physically Impaired Against Segregation focussed on physical barriers to inclusion in society (UPIAS 1976), a more complex understanding of disability and forms of oppression is now required for people with a sensory impairment. For visually impaired people in particular, disability is formulated in the intersection between the aspects of their sensory impairment and the social world. Theorists need to consider the dynamic and varied nature of vision and perception, and the intersection of the sensory schemas of learners and embodied perception, movement, language and social interaction.

There are significant implications of the use of sensory ethnography for the research community. Sensory ethnography enabled an exploration of the 'complex sensory practices' of everyday routines in the classroom (Hockey and Allen-Collinson 2009, 220), and the elaboration of an ethnography of the senses. This study seeks in part to begin to redress the underdeveloped systematic analysis of sensory phenomena (Atkinson et al. 2008, 203) in ethnographic texts. The fieldwork privileged attention to the sensory cultures and modes of embodied action of the visually impaired students in the college contexts. In the specialist college in particular, alternative forms of social interaction and actions were apparent, which demonstrated the mobilisation of a range of sensory fields in the accomplishment of learning and everyday tasks.

While sensory ethnography could be viewed as an obvious step for an investigation of the experiences of sensory impaired people, the methods employed have broader implications for the research community. Such attention to the affordances of the senses requires the researcher to appreciate the range of perceptual schemas and their application in the social environment. 'It requires an open mind, as well as the courage and will to turn one's own body into a research tool. This step outside the outlined methodologies of western science is necessary if we really seek to understand the Other' (Ede 2009, 70). Further, the research led to an appreciation of the synaesthesia of the senses, and an awareness of the short-comings of Western definitions of knowledge of the sensory, perceived world. The dominance of 'the

Eye' in much social science research fails to represent the complexity of sensory codes, modalities and orders in social organisation.

In terms of pedagogy, the most striking finding was the significance of the intersection between the perceptual and sensory schemas of visually impaired students, and the demands of the learning task. This was particularly evident for those engaged in physical, diagrammatic or practical courses and tasks. For visually impaired students, their alternative sensory schemas created particular needs in the learning process, and were addressed and understood in a variety of ways by teaching staff.

Two significant themes emerged in terms of teaching and learning. It was apparent that auditory learning, language and interaction were highly significant themes in teaching and learning with visually impaired students. There is a long tradition of scholars highlighting the significance of language and discourse in the classroom (Bourdieu and Passeron 1977; Barnes and Todd 1977; Britton 1970; Bernstein 1971, 1973; Flood, Jensen, Lapp, and Squire, 1990). However for this particular group, of visually impaired students, language has increased significance, as 'language acts as a substitute for missing visual input' (Webster and Roe 1998, 163). Language, as a means of auditory learning, is central to visually impaired students' conceptualisations of information. Verbal communication impacts upon interactions and relationships between tutors, students and their peers, due to the reduction in visual communication available through body language and gesture. Thus, the requirement for precise elaborate verbal explanations and descriptions to facilitate access to teaching and learning tasks was paramount in all of the classrooms observed. The success (or failure) of the tutor in relating and explaining tasks and concepts was related to their ability to conceptualise and effectively communicate a task or concept in a verbal form, or to 'translate' a visual concept into an auditory one. Within sport, for example, the ability of the tutor to verbalise effectively was essential to the successful employment of embodied actions and movement in sites of learning. The body itself thus becomes a place of learning and experience (Perry and Medina 2011, 62; Pineau 2002), guided by the verbalisations or physical manipulations of the tutor. The student is 'a learning self that is in motion' (Ellsworth 2005, 7). Some scholars have asserted that, in an educational setting, 'embodiment is a learning phenomenon' (Powell 2006, 152). Analysis of the embodied performances of students within the classroom context in sport and food preparation lessons thus enabled exploration of the significance of the body and movement to the learning experience.

This relates to the second, sensory theme, that of tactility, texture and odour in the classroom. Touch, texture, and smell, as social products, have been largely neglected in ethnographic studies in education, with a ‘bias towards the visual’ (Blake 2011). For visually impaired students, tactility has increased significance, both as a ‘way of knowing’ the world, and as a teaching tool and construct. Whether through the kinaesthetic teaching of blind football through touch, or through the tactile methods of food production, fieldwork confirmed the centrality of touch to the pedagogic processes.

In terms of pedagogical practices, attention to the sensory affordances of the classroom thus yielded valuable data on the sensorial practices of teaching and learning. The research design enabled me to pay close attention to the perceptual elements of tasks and interactions, and to the relationships between sensory and embodied modalities, whether visual, auditory, tactile, olfactory, or kinaesthetic. The study supports Shilling’s assertion that schools and other educational institutions are involved in bodily control, and that educational ‘cultures have specific “techniques of the body”’ (2003, 23) which may result in exclusionary practices for certain sectors of the student population, such as those with a visual impairment. In some of the pedagogical moments encountered in this study, particularly those in mainstream colleges ‘shared vocabularies of body idiom’ (Goffman 1963, 35) were found to be missing, due to contextual and conceptual differences in perception. This resulted in social disjuncture and lost learning opportunities.

However, sensory ethnography has more to offer than just attention to the senses in those cases where one sense is culturally perceived to have been missing: sensory ethnography is a valid method which can enhance both research practice and understandings of pedagogy in all settings. *All* learners have unique perceptual schemas, and pedagogy which pays attention to the full range of senses enables and enriches the embodied, sensorial learning experience. For example it was noted during fieldwork that tutors in mainstream college classrooms followed the Visual-Auditory-Kinaesthetic (VAK) learning styles model (Dunn et al. 1984) adopted in many further education classrooms, identifying pupils as either visual, auditory or kinaesthetic learners, and simply addressing these three elements in their teaching delivery. In some cases this simplistic approach, critiqued thoroughly by researchers (Coffield et al. 2004), resulted in a systematic failure to address the complex nuances of the learners’ perceptual schemas, and the intersection of these with the sensory demands of the learning task. In addition, visual methods were seen to be prioritised in the majority of lessons, even those in subjects such as cooking, where the sensory nature of the task could

yield valuable variation. Although the teaching and learning of non-visually impaired students was not the focus for this project, future sensory ethnographic research focussing on the use of the senses in education could provide valuable depth to understandings of the processes of sensory pedagogy.

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