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## Language teachers making sense of Exploratory Practice

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## Abstract

This article critically examines the implementation of Exploratory Practice in an English for Academic Purposes (EAP) context in a British university. The innovation involved challenges as well as opportunities for uniting learning, teaching and research. Particular emphasis is given to two teachers, who are the focus of this article: the story of one, 'Jenny', illustrates the processes of doing Exploratory Practice with learners of EAP, while the story of the other, 'Bella', provides insight into the notion of puzzlement, a central feature of the Exploratory Practice framework. For these practitioners, it was clear that the integration of pedagogy with locally relevant, small-scale research activity, held a wealth of opportunities for language learning and teaching.

## **Keywords**

Exploratory Practice, integrating research and pedagogy, practitioner research in EAP

## **I** Introduction

Exploratory Practice (EP) is a form of practitioner research in language education which aims to integrate research, learning and teaching. Developed in the early 1990s (Allwright, 1993; Allwright & Bailey, 1991; Allwright & Lenzuen, 1997), at least partly in response to dissatisfaction with more traditional forms of classroom based research, EP promotes the idea of teachers (and learners) puzzling about their language learning/teaching experiences, using "normal pedagogic practices as investigative tools" (Allwright, 2003, p. 127). This move takes teacher research (Johnson & Golombek, 2002; Stenhouse, 1975), action research (Burns, 2010; Carr & Kemmis 1986), and reflective practice (Edge, 2011; Schön, 1983, 1987) a step further. By incorporating research into pedagogy, EP seeks to address the issue of the demands of research pulling practitioners away from their teaching and learning responsibilities.

This is an account of how two English language teachers made sense of EP; the dilemmas, challenges and opportunities they faced as they tried implementing EP for

the first time into their practice. I worked alongside the teachers and learners to investigate the processes of initiating EP in an EAP context taking an EP approach myself. My intention is to take a critical look at the principles and practices of EP, considering the tensions at play when EP is implemented for the first time in a new context. Hence my own questions surface throughout the article, alongside those of the participants, to provide a multidimensional picture of the EP principles in action.

## **II Exploratory Practice: a principled framework**

Over the past two decades, EP has been developed in discussions with teachers from around the world (Allwright, 2003, 2005; Hanks, 2009; Slimani-Rolls, 2003, 2005; Wu, 2004; Zhang, 2004), with particular input from the EP Group in Rio de Janeiro (Kuschnir & Machado, 2003; Lyra, Fish Braga, & Braga, 2003; Miller, 2003, 2009). The EP framework is based on the following principles:

Seven principles for inclusive practitioner research
Principle 1: 'Quality of life' for language teachers and learners is the most appropriate central concern for practitioner research in our field.
Principle 2: Working primarily to understand the 'quality of life', as it is experienced by language learners and teachers, is more important than, and logically prior to, seeking in any way to improve it.
Principle 3: Everybody needs to be involved in the work for understanding.
Principle 4: The work needs to serve to bring people together.
Principle 5: The work needs to be conducted in a spirit of mutual development.
Principle 6: Working for understanding is necessarily a continuous enterprise.
Principle 7: Integrating the work for understanding fully into existing curricular practices is a way of minimizing the burden and maximizing

sustainability.

(see Allwright & Hanks, 2009, p. 149-154, original emphases)

## 1 Quality of life

In EP, a practitioner researcher wishing to develop his/her understanding of classroom language learning needs to consider the principle of 'quality of life' (QoL) above all.

This first principle challenges the more common expression of the 'work/life balance', suggesting that instead of a dichotomy, life and work in the language classroom should be seen as one, as Gieve & Miller explain:

[QoL] is what teachers and learners understand, and/or try to understand about their joint experience in classrooms, [...] these understandings are of greater intrinsic importance to them than how productive or efficient classroom outcomes are by external standards.

(2006, p. 23)

In other words, whatever practitioner researchers do, they need to ensure that the quality of life in the language classrooms they inhabit is enhanced by the research they undertake.

## 2 Working for understanding(s)

This principle emphasizes working towards understanding(s), rather than the more common approach of problem-solving. Starting with 'puzzlement' in EP invites an alignment with the notion of "... an education of 'I wonder' rather than 'I do'." (Freire, 1973, p. 36). Allwright suggests that EP can encourage:

... linguistically productive ways of developing classroom understandings, by finding classroom time for deliberate work for understanding, not instead of other classroom activities but by exploiting normal classroom activities for that purpose.

(Allwright, 2003, p. 121)

Crucially, EP promotes a stance of open-ended, puzzled inquiry for practitioners; it creates the space for practitioners to explore their puzzles while concurrently practising the target language.

## 3 Collegiality and mutual development

EP addresses the intricacies of human relations, knowledge, and practices in language learning and teaching (see Allwright, 2003, 2005). Attempting to combat the frequently indicated 'rift' between academics and practitioners (see Freeman, 1996; Johnson & Golombek, 2002; Edge, 2011) EP foregrounds the importance of bringing people together to bridge this gap. Practitioners (teachers, learners, and indeed researchers) are invited to work collegially in ways that provide opportunities for mutual development. Introducing this concept, Allwright explains that "...collegiality will perhaps be best served if all involved are manifestly working for each other's development as well as their own." (2003, p. 129), while Hanks argues that "[w]orking collegially means bringing participants together to share both the work and the rewards of research" (2009, p. 52). In other words, what helps the teacher should also help language learners and/or other teachers, and vice versa, in a continuous loop of learning and development.

4 Working for understanding as a continuous enterprise

EP suggests that practitioners do their research during instructional time, in other words, the research is the pedagogy (and vice versa). In promoting this approach EP can be seen to be responding to issues raised in previous years (Cochran-Smith & Lytle, 1999; 2009; Freire, 1970, 1973; Zeichner & Noffke, 2001), namely:

- (i) the relevance of the research: to whom/for whom? implemented by whom?judged by whom?
- (ii) the need for more time and resources to do the research
- (iii) the struggle for recognition of practitioners as legitimate owner/generators of knowledge.

By recommending that practitioners take what they already do and utilize their preexisting pedagogic practices as research tools, EP offers an opportunity to develop understandings of language learning and/or teaching, in a sustainable ecology of research and pedagogy.

5 Integration of research and pedagogy: using PEPAs

Using what the EP literature refers to as 'Potentially Exploitable Pedagogic Activities', or PEPAs (Allwright & Hanks, 2009, p. 157), may seem baffling at first. A novice might ask: What kind of pedagogic activities can be potentially exploited in this way? How is it possible to utilize 'normal classroom work' as a way of investigating a puzzle? One of the stories below works through these questions from the perspective of a teacher new to practitioner research.

EP argues that almost any communicative activity can be harnessed to this end (for examples see Chapters 12-14 of Allwright & Hanks, 2009; Hanks, 2009, 2013a, 2013b; Miller, 2003; 2009; Slimani-Rolls, 2003; 2005; 2009; Zhang, 2004). But

careful thought is required to reframe pedagogy in this way, as Section VI shows. This is not because PEPAs are intrinsically difficult, but because habits of seeing, thinking, knowing, are deeply ingrained, so discovering the elegant simplicity of the integration of pedagogy and research may take time.

## **III EP in an EAP context**

English for Academic Purposes (EAP) is frequently seen as a high-stakes, productfocused context (see Alexander, Argent & Spencer, 2008; Hyland, 2006; Jordan 1997). Consequently, I was uncertain whether the EP principles could be accommodated in any pre-sessional EAP programmes. To investigate, I worked with colleagues (teachers and learners) in a British university on the third term of a yearround pre-sessional course, which I shall call P3.

## 1 The P3 Pre-sessional Course

The overall goals of P3 may be summarized as follows:

- To develop skills which will enable learners to cope with the demands of academic study in a British university
- To improve general language and communication skills in English
- To provide orientation to life in the university and in the UK more generally.

This is a highly charged, intensive period of study, in which the course director, teachers and students need to collaborate closely in order to achieve their goals in a short period of time. Yet the EP framework emphasizes a low-key approach, with a focus on 'quality of life', mutual development and sustainability, and working towards understanding rather than problem-solving. I was curious to see how robust the EP principles would be in this specialized atmosphere. Would the very goal-oriented nature of EAP pre-sessional programmes inhibit the uptake of this form of practitioner research?

## 2 Who were the participants?

The course director and deputy of P3 had been discussing the 'Options' strand on the course, and wanted to try something new, thus the suggestion of an EP strand was

welcomed. We agreed that EP would be implemented with one class of fifteen learners as a pilot. Two colleagues (whom I shall call "Bella" and "Jenny") volunteered to participate in the study; they were keen to try out EP, having heard a little about it from me and other colleagues in previous years. They were both experienced teachers of English as a foreign language and of EAP, and having worked on P3 for a number of years, they were familiar with the course, the students, and the context. However, they had not attempted practitioner research before.

#### 3 What did we do?

Typically, the learners have enrolled on P3 in order to prepare for an International Foundation Year (IFY), leading to their chosen undergraduate degree programme. The course provides twenty-one hours of tuition in ninety-minute classes, five days a week, over eleven weeks. Classes focus on Academic Writing, Language Development, Speaking, Reading, Listening and Note-making Skills. EP was incorporated into the original plan of a series of 'Options' classes. One to two lessons per week (taught by Jenny) were dedicated to EP, while the other Options classes (taught by Bella) developed topics in British Culture such as Law, Education, or the Environment. IELTS preparation classes were also offered. A sample timetable is provided in Appendix I.

In the first week of P3 (following induction week), I gave a forty-five minute talk to the class in their 'Options' slot. This talk performed the dual purpose of introducing the principles of EP and providing the students with the opportunity to practise listening to a 'live' lecture, take notes, and summarize the main points. Such listening and note-taking activities are integral to EAP courses, as these are skills the students will need on their academic degree programmes. However, the topics of the talks are more usually the British education/legal/government system, or issues in engineering, healthcare, the environment. Turning these 'listening and note-making' tasks into a 'potentially exploitable pedagogic activity' (see Section II above) was the first step in implementing EP.

After highlighting the EP principles, and citing some previous examples of teacher and learner puzzles, I ended the session by inviting the learners to think about what puzzled them about their language learning experiences. Concurrently, the teachers (who also attended the talk) wrote down their own questions puzzling about their language teaching experiences. Appendix II provides more details of the participants and their puzzles.

Having given the weekend for the learners to reflect on their puzzles (and change them if they wished), Jenny began her first EP session in her next Options slot. She set up a whole-class mingling activity: all the students came to the middle of the room and asked each other what had puzzled them. Clusters began to form around similar topic areas (eg. issues to do with speaking; writing; vocabulary learning), and these coalesced (with Jenny's encouragement) into groups of three or four students. The opportunity to work individually was also offered, but the students preferred to work together.

In the following weeks, the groups first refined their questions, and then began to discuss ways of investigating what had puzzled them. Many of them chose to use questionnaires as a way of collecting data, while others created short interview schedules to be held with other students, tutors, and/or lecturers in the institution. This data was then collated and analyzed (by the students), and in Week 7 they presented what they had found so far in group-poster-presentations to their class. As follow-up work, they then worked in groups to write methodological accounts of their work.

Again, it is worth emphasizing that student projects of this nature are typical activities on pre-sessional courses. Nothing new was added: the learners would have worked on questionnaires or interviews, collected, collated and analyzed data, and given poster presentations in any case. The only significant difference was the invitation to consider the pedagogic processes themselves (rather than more usual topics found in EAP such as malaria, recycling, or globalization). In other words, existing classroom activities were used as tools for investigation, thus combining research and pedagogy in sustainable and relevant ways.

At the same time, their teachers worked on their own puzzles. Jenny focused on her own classroom by giving space to her students' investigations and encouraging them to act as 'co-researchers' alongside her. Bella shared her puzzle with students via class discussion, and visited the library. She also talked with teachers inside and outside her institution. In time, both teachers gave presentations of their work, one at a local level in a Continuing Professional Development (CPD) workshop for colleagues, the other at a national conference.

## **IV Method**

I worked as a participant-researcher alongside my colleagues (teachers and learners). In collecting the data, I took a multi-dimensional approach (Richards, 2003): I recorded planning meetings (by permission) when appropriate and I interviewed Bella and Jenny at regular intervals (before, during, and after the EP innovation) to capture their responses to EP over time. Table 1 shows how EP unfolded week-by-week, and at what stages of the course the interviews took place.

[Insert Table 1 here]

This provided a variety of streams of data, which needed sifting. To do so, I used a form of Template Analysis (King, 2004). Initially, a template of the seven principles was used – interviews with teachers and learners were transcribed and analyzed according to the template: utterances (explicit and implicit) relating to 'Quality of life' 'understanding [including 'puzzling']' 'involving everyone' 'collegial working' 'mutual development' 'sustainability' and 'integrating work for understanding into normal pedagogic practice' were identified and mapped onto this template.

King (2004) argues that the advantage of Template Analysis is that it allows for introduction of further themes as they emerge during the analysis. Here, for example, I noted the prevalence of utterances about problems as well as puzzlement, puzzles, and being puzzled, so formed a new theme around this issue. Bella's story falls mainly within this theme, providing many insights into EP puzzle formation and refinement. In addition, I was interested in the processes of implementing EP for the first time, so made a separate category for this which included the whole process, from planning the innovation (the anxieties as well as excitement this provoked) to reflecting on the experience of EP in the final weeks of the course. These processes and emotions are examined through Jenny's story. Themes under discussion here are:

- the processes of EP (including challenges of implementation)
- issues to do with puzzlement (including references to problems as well as to puzzles)
- the seven principles of EP

Segments of data were tagged and linked to these themes, and a multi-layered picture of EP in an EAP context developed. Template Analysis also allows for overlapping themes, or interconnections between themes, and this was helpful in considering the knottiness of puzzlement (eg. how a 'puzzle' might be differentiated from a 'problem'), and the relationships between the principles, which formed an organic whole. In the two stories under consideration, the themes of the seven principles are interwoven throughout. Jenny's story illustrates the processes (and challenges) of implementing EP with her class, while Bella's story illuminates the shift from a problem-solution mindset to an attitude of puzzled enquiry and beyond.

As mentioned in Section II, EP promotes using familiar pedagogic activities (in EAP this includes surveys, interviews, class discussions and project work) as investigative tools. This is a way of foregrounding learning and teaching rather than imposing extraneous research activities which would have taken time away from the business of the classroom. For example, the initial presentation, which introduced EP to the participants (both teachers and learners), also gave learners an opportunity to practise their listening and note-making skills; the data collection processes facilitated group discussion and research skills; the poster presentations developed academic presentation skills, and the group assignments facilitated writing skills. These activities are not unusual in EAP classrooms around the world. Significantly, however, EP shifts the agenda away from more general EAP topics such as environmental issues to focus on participants' personal pedagogical experiences.

## V Challenges when planning EP: a step into the unknown

One of the questions that the P3 team had been discussing was how to make the third term just as compelling for learners who believed (rightly or wrongly) that they had

already achieved all they needed to go on to academic study in a British university. As with all courses in my institution, planning meetings were held regularly, and Bella and Jenny included me in discussing the implementation of EP on P3. Over the course of our meetings and individual interviews, they expressed a range of emotions. This was understandable: neither teacher had tried practitioner research before, and the notion of including learners as "co-researchers" (Allwright, 2003, p. 129) was unfamiliar to them, consequently a new landscape was unfolding, with new challenges for them to face.

The teachers needed to consider issues to do with motivation and possible discipline problems as they planned. In the initial planning meeting, Bella raised a concern about the learners abdicating responsibility for their own learning and focusing only on the end-product:

**Bella:** I suppose one of my worries is that ... that we're going to get some of our students who will just sort of go... because of that whole thing about them not really wanting to be independent and wanting teachers to tell them and that everything is either so different that they ... just kind of go 'oh well, whatever'

(Planning meeting 1)

Jenny agreed, noting the potentially disruptive consequences of learners failing to engage with EP. Both teachers had noted a tendency for learners on previous P3 courses to procrastinate but finally produce superficial presentations as required by their teachers:

**Bella:** the way that they all seem to work generally is that you introduce them to something and you teach them however long the project is meant to last thinking they're not doing anything and then they suddenly pull something out of the bag

(Planning meeting 1)

Shortly afterwards, Bella expanded her point. She wondered if the learners would engage with EP, and even challenge their teachers by questioning the aims of the activity, or if they would exhibit unquestioning obedience. She contrasted this approach with her approval of the emphasis on process in EP, hoping that the fact of having to go through the process would eliminate the apparently competent, but content-less presentations she had seen in previous years. These comments show the classroom as a site of struggle, with tensions developing between teacher and learner expectations. As they considered EP as an innovation requiring critical engagement, the teachers were preoccupied by such challenges, as Jenny's story below shows.

## VI Jenny's story: Processes of implementing EP

Jenny's story illustrates the processes of implementing EP for the first time. Her own puzzle, 'Why do students find it difficult to remember or to recall vocabulary?', continued alongside her students' puzzles, but her narrative places the students at the centre of the EP work. Trying out EP for the first time meant that Jenny had to face a number of challenges, including her own emotional responses as she anticipated the innovation.

At first, Jenny tempered her excitement about EP with a degree of caution:

**Judith:** how do you feel about starting this work that we're going to do on P3?

Jenny: [softly] excited [laughs]

Judith: excited?

**Jenny:** yeah, yeah, a little bit, sort of, I don't, I wouldn't say nervous, but I'm not really sure where we're going or what this is about... from what I think it's going to be about, that's something that goes in line with what I'm naturally interested in, so I'm looking forward to seeing what the students make of it

(Interview 1b)

Jenny, as the teacher working most closely with learners doing EP in the classroom, pondered her role in the classroom:

**Jenny:** I wondered what you do in the case when students draw a blank and kind of say 'well I don't really have any puzzles', how much do you push them, how much do you guide them?

(Interview 1b) in case they did not

As well as contemplating how much she should steer her students in case they did not have puzzles, Jenny was also worried about too much engagement:

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**Jenny:** there's one very deep thinker in the class and ... what if he comes up with 'what's the meaning of life?' – you know what I mean! Something a bit too deep...

(Interview 1b)

Asking 'deep' questions would be encouraged in EP, but if the beginning EP teacher feels obliged to supply the answers, this can be an impossible position.

The emphasis EP gives to learner empowerment means that the teacher's role is less clearly defined; lesson planning must take a different form. Since the learners and their puzzles will be driving the lesson, the teacher cannot know precisely what will happen in the class:

**Jenny:** ... it's a learning process for me, I'm in a different role [...] normally I'm going in, going 'well I've got a clear idea of my objective' or, or what I need to be doing, so it's learning to feel comfortable being a bit sort of... reacting really, rather than creating things, but sort of seeing what happens and then working from that

(Planning meeting 2)

Jenny needed courage to go into the classroom with such a radical agenda of learner empowerment – perhaps not all teachers would feel comfortable with the ambiguity she outlines above. Jenny had never tried EP before, and did not know if the learners would have any puzzles, nor how they would react to being empowered.

Lesson outcomes (always tricky to predict) move further out of the teacher's control when power is redistributed to include the learners as agenda (puzzle)-setters: the teacher has to take on a different role, and lesson objectives require a different formulation. Jenny pinpointed this precisely:

**Jenny:** yes because I was thinking [panicky voice] 'oh woah' and then I thought 'I think that's the whole point' [laughs] you know, 'I'm not supposed to know what's going to happen'

(Planning meeting 2)

Usually in the literature of practitioner research (including much published EP work), teachers are described as investigating their puzzles, with learners invited to help. However, here learners were invited to join in with their own puzzles, and to act as co-researchers alongside their teacher. Thus Jenny had to move away from the kind of lesson plan that her training (in CELTA and institutional CPD programmes) had instilled. For example, instead of writing objectives such as 'By the end of the lesson the learners will have learned the uses of the Past Simple', she had to re-frame her objectives to 'By the end of the lesson the learners will have had the opportunity to share their puzzles about language learning'. In many ways, this is liberating. But freedom can also be daunting, and Jenny's reaction encapsulates this interplay between fear and desire.

A further challenge was that Jenny needed to trust the learners to take the work seriously; that they were capable of developing their own reasonable and researchable questions, of exploring them, and of sharing their findings. Her worries, familiar to most working teachers as they contemplate innovations with a new class, continued as we talked through her plans for the first lesson:

Jenny: and I suppose as well [...] thinking 'what if something goes wrong?' or you know, 'what if they...' this, or 'what if that...?'
Judith: yes, yeah, have you thought about what sort of things, I mean, not wishing to tempt fate or anything, but what sort of things might go wrong?

Jenny: um I suppose [...] it's just more a case of kind of, well, you know 'what if they just don't get into the discussion and after sort of twenty minutes they've decided what they want to do...'

(Planning meeting 2)

The fear of emptiness in the lesson, where the teacher feels obliged to fill the gap is common, perhaps stemming from initial teacher training, where teachers are exhorted to plan every minute, with extra activities 'up the sleeve' ready for any who finish the task early. It is rare to find situations where learners are trusted to come up with their own initiatives, and this added an extra element of risk to the EP enterprise.

Despite her initial anxiety, Jenny reported that the learners did have questions that puzzled them about language learning. They seemed pleased to have been asked, and expressed interest in the possibility of investigating further. Jenny returned from her first EP class full of energy, and related the stages of the lesson and the learners' reactions.

Having given the learners the weekend to reflect, she started the session with an opportunity for participants to refine their puzzles, via a whole-class mingling activity where they shared their questions with one another. Groups of learners began to form around similar themes, and these groups discussed how to investigate their questions. Jenny particularly liked the idea that she and the learners would be working together on their puzzles at the same time:

**Jenny:** it was quite nice actually, one of the students said to me 'what's your puzzle, Jenny?' and I thought 'oh yeah, you've got the point' [...] so it would be interesting to see in tandem and I could ask them while they're doing it, it might be quite a good way for them – we can kind of watch each other doing the research

(Interview 2b)

Over the following weeks, the learners created questionnaires to carry out small-scale surveys, or interviewed other learners or teachers to generate data. They also visited the library and used the internet to gather further information on their chosen theme. They then collated and analyzed their data, and created posters for group presentations of their findings. I observed them working hard to produce their posters, often staying behind long after classes ended to work on their presentations. As follow-up work, they wrote group assignments detailing the work they had done.

In my opinion, the learners in the study took the work extremely seriously, thus confounding the doubts their teachers had expressed when planning the innovation. Even puzzles that at first seemed to be challenging or humorous (eg 'Why do people learn bad [swear] words more easily?') turned out to offer profound opportunities for learning. For example, one learner, "Ted", contrasted the attraction of his EP puzzle with more common EAP topics for investigation:

**Ted:** recycling, we know we have to do recycling, and we know we have to reduce [...] many rubbish so I can't find any point to write an essay, but something new I can write about it

(Interview 1i)

Ted argued that since the 'solutions' to the problem (in this case, recycling), are already well-known, this made writing about recycling less enjoyable. In contrast, investigating the social and psychological implications of learning taboo words, where answers are as yet unknown, perhaps even unknowable, would trigger a more interested response. In his final interview, he commented again on the effect of investigating his puzzle rather than the more common EAP topics of the environment or recycling, saying how helpful he had found this approach.

Echoing Ted's (entirely separate) comment, Jenny described a new sense of intrigued inquiry as an equal alongside the learners in her class. In moving away from typical EAP topics such as recycling and allowing learners to relate their investigations to their personal learning experiences, Jenny had opened up the possibilities for mutual development. In doing so, she had found ways to reactivate her own interest in teaching and learning – 'quality of life' writ large:

Jenny: I thought 'I really know no more than you about this', I mean I have my ideas about why people remember swear words and what-have-you, but actually the most relevant [...] is going and doing some research [...] it's a nice position to say 'well you tell me the answers'; if you say 'go and research recycling' I've read so much on it [...] I kind of feel like I know the answers so you're not telling me anything new [...] so I didn't have to feign interest and I think that was refreshing for them and for me

(Interview 4b)

Jenny reported unusually high levels of student engagement, particularly during the poster presentations. She explained that not only had they prepared well (as might be expected for any performance), but that during the presentations they had listened to each other intently, and asked penetrating questions:

**Jenny:** I just sensed this real sense of ownership [...] they all knew, they really knew, what they were talking about

(Interview 4b)

There seemed to be no trace of the original anxiety she had expressed in the planning meetings. In contrast to initial fears, students had not "pulled something out of the bag" at the end, rather, they had worked independently to thoroughly investigate their puzzles and disseminate their findings.

Towards the end of P3, I asked Jenny to reflect on the experience of doing EP:

Jenny: Bring it on! [laughs] [...] yesterday in discussion about creativity, [...] about letting students lead the way, I think [EP] makes them realize what *they're capable of [...] and I think it helped me view them in a much more* adult kind of way

(Interview 4b, emphases added)

#### VII Bella's story: from problems to puzzlement

Bella was not scheduled to teach EP sessions in the class she shared with Jenny, and she had assumed that this would exclude her from the EP work. When I asked her how she felt about EP she responded wistfully:

**Bella:** I'm not really going to be doing much of it I suppose, so I'm kind of... frustrated [laughs]

Judith: are you?

**Bella:** that I'm not... well yeah I mean, well I'm pleased that Jenny is gonna, because Jenny is really interested in it and has got more time to put into it so, you know, I'm interested to see how it's going to work, it's quite exciting

(Interview 1a)

She described the attraction that EP held for her:

**Bella:** I think it's nice because my teaching, oh just everything has gone a bit stale and same-y to a certain extent, and I think things like that sort of shake you up and make you think a bit

**Judith:** yeah, one of the things I was thinking, cos you, now we started talking about puzzles yesterday, and I was thinking 'well there'd be nothing to stop you researching your own puzzle yourself even though the students aren't doing anything' so if you wanted to...

However, despite her enthusiasm for EP, Bella hesitated about engaging in EP herself, citing lack of time as an issue:

Bella: ... yeah, I think it's making... making the time isn't it?

(Interview 1a)

Trying not to add to the teacher's burden (by integrating teaching, learning, and research) is one of the principles of EP, so her response is significant – lack of time seemed to be a challenge for a teacher implementing EP as part of her own practice.

When I asked Bella what puzzled her about her language teaching experiences, it was as if she had been holding back years of questions. As the extended extract below shows, her puzzle shifted and re-formed before coalescing into a very specific question:

**Bella:** I think it's, yeah, [...] 'how much do I ... do I have any impact on them at all, really?' [...] and because they're here in the UK, and the students that make most progress, huge amounts of progress, and it seems to be more to do with their own motivation and ability than anything that I do in the classroom, and I'm not entirely sure... I dunno – so many... just sort of difficult to separate them, and then the autonomy, ... 'why- what is it – why are we bothering? Are we trying to... are we teaching them to be independent? Should we be teaching them to be independent? Are we teaching them to be independent? because it's cultural and therefore actually if, as long as they get by without being independent, does it matter as long as they get to what they need to get to anyway?' and um... I dunno... and sort of coming down to language learning, 'why – why can't middle eastern students spell?' It's my [laughing] my main problem at the moment - I cannot ... and 'how do you ... teach...?' – I don't know how to teach them spelling

(Interview 1a)

The extract above shows how she started with what may be categorized as 'existential' questions ('do I, the teacher, make a difference to the learners?'), moved into issues around learner independence and whether this can/should be taught ('are we imposing cultural values about learner independence on our students?') and ended with a shift into the very practical issue of teaching English spelling.

Minutes later, Bella reiterated her question:

Bella: actually it drives me madJudith: odd isn't it? Why?Bella: why can't they?

## (Interview 1a)

This expression of frustration and annoyance is typically associated with a problem (ie 'this group of students can't spell, and I don't know how to teach them spelling'), and probably should not be described as a 'puzzle' at this point. But over the weeks, as she opened her question out to involve others (learners as well as teachers), and

shifted the emphasis away from finding a solution towards developing understanding, Bella's attitude changed.

At first, Bella explained the background to her question: having just two nationalities (Japanese and Saudi Arabian) in her classes had thrown the contrast between them into sharp relief. She had noticed a group of Saudi learners who were reasonably proficient in their spoken English but failed to achieve good scores in their assessments due to poor spelling. She was already aware of research into teaching spelling to British primary school children, but had found this inadequate for her learners, who were young adults preparing for university study. Her first thought was to initiate more spelling tests, asking them to memorize lists of words, but she rejected this rather mechanical solution, particularly as the two nationalities in her class had very different needs. Most of her Japanese learners had little difficulty with spelling, while the majority of her Saudi learners struggled.

Taking an EP approach (principles 3 and 4), she decided to talk to the learners themselves about it, asking their opinions on the matter. Her learners evinced great interest in her puzzle: they tried to explain why they thought they were having trouble with English spelling:

**Bella:** they were all sort of shouting out these, not the answers, but sort of this... when I was [...] talking about what they were going to be doing really and... 'this is something that I'm thinking about, is: why... none of you can spell?' [laughs] They've all got their own ideas but [name of student] was saying that it, it's to do with vowels mainly... and I think it is.

(Interview 2a)

The temptation at this point is very strong to find instant 'answers' or solutions to the initial question. However, Bella resisted the pull, and as she explored her puzzle, she began to question common pedagogic practices:

**Bella:** I think for the teacher it's something that's easy to correct as well, whereas if you get grammatical problems in a sentence you kind of un-pick it, sometimes... whereas that I can say 'that's spelt wrong' so I suppose when we mark things there's loads of red pen that says spelling, spelling, spelling, because we can identify it, whereas sometimes you just kind of ignore

sentences and you just put 'don't understand', which doesn't really tell them what they're doing wrong [...] so it is, yeah, it's creating lots of... a few questions [laughing]

(Interview 2a)

She pinpointed one issue: that teachers might find it easier to mark and correct orthographic mistakes than to deal with complex issues of syntax and meaning. However, she reached a stage where puzzling led her back towards a sense of frustration:

**Bella:** [...] and then there's all the phonetic stuff... that and I think it's to doit's all, I think it involves listening and reading and- and I don't know really... [fades off] ... so it starts, just we could do a whole year of teaching them spelling... and they probably ... I dunno, so yes, that's as far as I've got really, I just feel I'm going round in circles

(Interview 2a)

At the same time, though, Bella noted that EP was inspiring her to continue. Although she still cited lack of time as an issue, she was clearly thinking about othography. As the pressure to find a solution evaporated, she could contemplate finding out more about the question of teaching and learning English spelling:

**Bella:** it's motivating me to do it rather than making me... [...] but yeah if I had ... time. [...] But it's making me – I suppose making me think about ways I could make time, sort of if I do find that I've got time it's what I will do

(Interview 2a)

As the weeks passed, Bella took more active steps to explore her puzzle. She began to explore ways of developing her own and her learners' understandings (principles 3 and 5), and the frustration conveyed in her earlier comments diminished. She collected potential reading material:

**Bella:** yeah, I've been to the library... and the resources room, and got a pile of books [...] um and I was thinking 'that's it' and then I found... and I sort of put in 'teaching spelling + Arabic students' or something and there's a book that's due out this summer that [...] is looking at exactly the same question really

(Interview 3a)

In keeping with her training (Bella had completed both the DELTA and an MA in English Language Teaching years earlier), her first response was to look for literature published on the topic, but this turned out to be of limited value:

**Bella:** so there was an article by her that was good and there was another article that was looking more... it was looking more ... sort of analyzing problems ok, and it d- sort of what problems but it doesn't answer why, which is what I was asking...

(Interview 3a)

Bella concluded that she needed to work independently in order to understand why some of her learners had difficulties with spelling while others did not. She made contact with people outside her immediate team (principles 3 and 4), sent out a questionnaire to teachers (and learners) in her workplace, and was surprised and reassured by the discovery that others were also grappling with the issue:

**Bella:** I mean, I'm enjoying [EP], and it's making me talk... you know, I'm sort of talking to other teachers about it as well, which is, you know, sort of not just on P3, which I mean, you know, you get very enclosed, and um, and you realize that other teachers have thought about the same thing and worried about it, but it kind of, it, I think it gives you that kind of push to... about something that's just annoyed you

(Interview 3a)

Sharing her question with colleagues, Bella found they were also interested in what she had originally thought was an issue for her alone. Indeed, one colleague approached her to explore the issue further:

**Bella:** and then the plan is that at some point over the summer I [...] do a bit more reading about it, perhaps develop some materials for a workshop. I mean [name of colleague] is interested in it as well [...] she came to see me

(Interview 3a)

Bella collaborated with this teacher in the months following P3, and they first created, then piloted, their own materials for teaching spelling. They followed this up with a teacher development workshop for colleagues ten months after Bella's original formulation of her puzzle.

At the end of the study, there was no trace of the annoyance Bella had expressed in the first interview. Instead, an increased sense of respect for her learners had emerged: **Bella:** it's helping me to answer the question why they find it difficult. There's lots of different reasons why, I think, really... yeah I feel like I understand more about the... problems that they have um, and the things that I need to think about as a teacher

(Interview 3a)

Bella postulated that teacher expectations are often based on a lack of understanding of the difficulties their learners have to face. She explained that her EP work in exploring possible reasons why (principle 2) certain learners had difficulties with spelling had given her a greater understanding of the complexities of the task:

Bella: it makes you realize that actually it isn't as easy as you think it is

(Interview 3a)

## VIII Discussion

Despite years of calls for practitioner research to be encouraged (Freeman, 1996; Johnson & Golombek, 2002; Zeichner & Noffke, 2001), the take-up has been scant. Reasons for this have been charted elsewhere (Borg, 2010, 2013; Breen, 2006; Burton, 1998) with Borg concluding that teacher research engagement is "a minority activity in our field" (2010, p. 391). Yet this study offers an alternative perspective. By inviting the teachers and learners to puzzle about their language classes, and investigate together, opportunities for practitioner research grew.

Rather than imposing extraneous research activities which would have taken time away from the real business of classes (ie., teaching and learning EAP), typical EAP pedagogy (such as project work, surveys, or class discussions) was utilized as smallscale, locally relevant research activity. As they engaged in EP, the participants began to understand the complexities of the challenges facing their counterparts. The participants also began to realize that their own experiences, their discoveries and explorations, held as much validity as those of other experts in the field.

Significantly, both teachers and learners in the study reported higher levels of motivation throughout the study. Jenny describes how she was released from the need to pretend an interest in something where the answer was known (performance), and was freed instead to listen to her learners as they explained their findings (gaining

understanding). As Jenny noted, giving space to learners to set their own agendas raised levels of interest, because they could talk about something new, and entirely relevant. She no longer had to "feign interest" in what they were saying about wellknown topics such as recycling, instead she could learn from the learners as they disseminated their findings about the social, psychological and educational issues involved in vocabulary learning, study patterns, and speaking skills. In doing so, Jenny had to negotiate her own position, moving away from the 'knower' towards 'co-researcher' so that teacher and learners could work together to investigate their questions on a more equal footing. The EP work enabled Jenny to view them differently: as adults who are active and independent individuals.

Bella began a more sustained exploration of the issue she had identified. As she continued, the moments of transition from irritation to puzzled curiosity and beyond can be traced. EP accommodates, even encourages, multi-layered puzzlement, and the refining of messy wonderings 'why', into a short, sharp question 'why can't my students spell?', with the significant addendum of 'I don't know how to teach them spelling' is an essential part of the process it advocates. The point here being that practitioner researchers may have to go through the fogginess of the broader (unaddressed) issues in order to get to the clarity of the individual question. In carrying out her investigations, and by including not only colleagues in the teaching profession, but also the learners in her classes, Bella gained significant insights into the complexities (Tudor, 2001) of learning and teaching. The move from frustration: "It drives me mad [...] why can't they?" (interview 1a) to a growing realization of the complexities of the issue she had identified "it makes you realize that actually it isn't as easy as you think it is" (interview 3a) is crucial in EP, and may take days, weeks, or even months to achieve.

The stories presented here may sound neat and tidy, but inevitably were not without complications. Group dynamics are complicated in any form of collaborative work, and EP was no exception. Issues such as setting up groups and working together; grappling with complex ways of collecting, collating, representing data; beliefs about research, teaching and learning, and what counts as 'proper' research, surfaced throughout the study. I wish to emphasise that integrating research and pedagogy is a complex activity, which involves conflict as well as harmony.

In attempting to bring practitioner research and pedagogy together, Allwright (1993, 2001) began a complex movement which aimed to gain time and space for practitioners to be able to do research in their own contexts. But this is predicated on an open-ended, apparently unstructured approach that differs from the more prescriptive, perhaps even narrow, world of EAP. In both cases it became clear that implementing EP required a change in the conceptions of lesson planning, and expression of aims, objectives and outcomes. This was most clearly articulated by Jenny, as she revealed uncertainty about how much to 'guide' the learners in her EP classes, and charted her shifting roles as she enjoyed reacting to the learners' contributions. Her story echoes the experiences of the teachers in Wu (2004), who, he tells us, had to find new ways of being in the classroom, new identities and new interpretations of their lifeworld. Beginning EP, or indeed any form of practitioner research, requires a reconceptualization of the world of classroom language learning, of pedagogy and of research.

## **IX Conclusions**

As EP continued on P3 a number of developments took place: (i) learners were able to practise the key language, and academic, skills that they needed (Principle 7) (ii) learners and teachers worked together, with other students and other teachers, both within the institution and outside it, discussing puzzling questions about learning and teaching (Principle 2; Principle 3); (iii) they also discovered, sometimes to their surprise, that they were not alone in puzzling about a particular issue (Principle 4), (iv) teachers began to understand the complexities of the challenges facing the learners in their classes (Principle 5), and (v) participants re-discovered their enthusiasm for learning and teaching (Principle 1).

EP, then, offers an exciting proposition: one which aims to integrate learning, teaching, and research. It promotes empowerment and in doing so, it challenges existing assumptions of performativity. But such an approach is surely not unproblematic. Any innovation, particularly one which invites power-sharing in the classroom, is likely to challenge preconceived ideas about learning, teaching, and, indeed, research.

The teachers and learners in this study had many issues that puzzled them, and these multi-layered, complex questions needed to be unpacked carefully. As Jenny and Bella's stories show, it was difficult to imagine in advance what EP might be like; they found out what EP was by doing it, rather than reading about it or hearing about it. Thus to really understand the connection between teaching, learning, and research, these teachers needed to do EP for themselves.

In an age of 'research-led teaching' (as promoted in my own institution) EP's focus on integrating pedagogy and research suggests a rich area for further study. The teachers indicated a shift in motivation (theirs and their students'), and related this directly to the EP work they were doing. They presented a renewed respect for student knowledge, and a move away from the instrumental, functional parameters of asking 'how (to)' and towards the pedagogical, philosophical implications of exploring 'why'. By positioning learners alongside teachers as legitimate investigators of classroom language learning and teaching, EP enhances the potential for understandings in pedagogy and research alike.

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## References

Alexander, O., Argent, S., & Spencer, J. (2008). EAP Essentials: A teacher's guide to principles and practice. Reading: Garnet Publishing Ltd.

Allwright, D. (1993). Integrating 'research' and 'pedagogy': Appropriate criteria and practical possibilities. In J. Edge & K. Richards (Eds.), Teachers Develop Teachers Research (pp. 125-135). Oxford: Heinemann.

Allwright, D. (2001). Three major processes of teacher development and the design criteria for developing and using them. In B. Johnston & S. Irujo (Eds.), Research and

Practice in Language Teacher Education: Voices from the field (pp. 115-133). Minneapolis, USA: University of Minnesota.

Allwright, D. (2003). Exploratory Practice: Rethinking practitioner research in language teaching. Language Teaching Research, 7(2), 113-141.

Allwright, D. (2005). Developing principles for practitioner research: The case of Exploratory Practice. The Modern Language Journal, 89(3), 353-366.

Allwright, D., & Bailey, K. (1991). Focus on the Language Classroom: An introduction to classroom research for language teachers. Cambridge: Cambridge University Press.

Allwright, D., & Hanks, J. (2009). The Developing Language Learner: An introduction to Exploratory Practice. Basingstoke: Palgrave Macmillan.

Allwright, D., & Lenzuen, R. (1997). Exploratory Practice: Work at the Cultura

Inglesa, Rio de Janeiro, Brazil. Language Teaching Research, 1(1), 73-79.

Borg, S. (2010). Language teacher research engagement. [State-of-the-Art Article]. Language Teaching, 43(4), 391-429.

Borg, S. (2013). Teacher Research in Language Teaching: A critical analysis. Cambridge: Cambridge University Press.

Breen, M. P. (2006). Collegial development in ELT: The interface between global processes and local understandings. In S. Gieve & I. K. Miller (Eds.), Understanding the Language Classroom (pp. 200-225). Basingstoke: Palgrave Macmillan.

Burns, A. (2010). Doing Action Research in English Language Teaching: A guide for practitioners. New York: Routledge.

Burton, J. (1998). A cross-case analysis of teacher involvement in TESOL research. TESOL Quarterly, 32(3), 419-446.

Carr, W., & Kemmis, S. (1986). Becoming Critical: Education, knowledge and Action Research. Lewes: The Falmer Press.

Cochran-Smith, M., & Lytle, S. L. (1999). The teacher research movement: A decade later. Educational Researcher, 28(7), 15-25.

Cochran-Smith, M., & Lytle, S. L. (2009). Inquiry as Stance: Practitioner research for the next generation. New York: Teachers College Press.

Edge, J. (2011). The Reflexive Teacher Educator in TESOL: Roots and wings. New York: Routledge.

Freeman, D. (1996). Redefining the relationship between research and what teachers know. In K. M. Bailey & D. Nunan (Eds.), Voices from the Language Classroom (pp. 88-115). Cambridge: Cambridge University Press.

Freire, P. (1973). Education for Critical Consciousness. New York: Seabury Press.Gieve, S., & Miller, I. K. (2006). What do we mean by 'Quality of Classroom Life'?In S. Gieve & I. K. Miller (Eds.), Understanding the Language Classroom (pp. 18-46). Basingstoke: Palgrave Macmillan.

Hanks, J. (2009). Inclusivity and collegiality in Exploratory Practice. In T. Yoshida,H. Imai, Y. Nakata, A. Tajino, O. Takeuchi & K. Tamai (Eds.), ResearchingLanguage Teaching and Learning: An integration of practice and theory (pp. 33-55).Bern: Peter Lang.

Hanks, J. (2013a). Inclusivity and trust in Exploratory Practice: A case study of principles in practice. In D. Soneson & E. Tarone (Eds.), Expanding our Horizons: Language teacher education in the 21st century (pp. 117-138). Minneapolis: University of Minnesota.

Hanks, J. (2013b). Exploratory Practice in English for Academic Purposes: puzzling over principles and practices. (PhD Thesis), University of Leeds.

Hyland, K. (2006). English for Academic Purposes: An advanced resource book. Abingdon: Routledge.

Johnson, K. E., & Golombek, P. R. (Eds.). (2002). Teachers' Narrative Inquiry as Professional Development. Cambridge: Cambridge University Press.

Jordan, R. R. (1997). English for Academic Purposes: A guide and resource book for teachers. Cambridge: Cambridge University Press.

King, N. (2004). Using templates in the thematic analysis of text. In C. Cassell & G. Symon (Eds.), Essential Guide to Qualitative Methods in Organizational Research

(pp. 256-270). London: Sage Publications.

Kuschnir, A., & Machado, B. (2003). Puzzling and puzzling about puzzle development. Language Teaching Research, 7(2), 163-180.

Lyra, I., Fish Braga, S., & Braga, W. (2003). What puzzles teachers in Rio de Janeiro, and what keeps them going? Language Teaching Research, 7(2), 143-162.

Miller, I. K. (2003). Researching teacher-consultancy via Exploratory Practice.

Language Teaching Research, 7(2), 201-220.

Miller, I. K. (2009). 'Puzzle-driven' Language Teacher Development: The

contribution of Exploratory Practice. In T. Yoshida, H. Imai, Y. Nakata, A. Tajino, O.

Takeuchi & K. Tamai (Eds.), Researching Language Teaching and Learning: An integration of practice and theory (pp. 77-93). Bern: Peter Lang.

Richards, K. (2003). Qualitative Inquiry in TESOL. Basingstoke: Palgrave Macmillan.

Schön, D. A. (1983). The Reflective Practitioner. London: Temple Smith.

Schön, D. A. (1987). Educating the Reflective Practitioner. San Francisco: Jossey-Bass Inc.

Slimani-Rolls, A. (2003). Exploring a world of paradoxes: An investigation of group work. Language Teaching Research, 7(2), 221-239.

Slimani-Rolls, A. (2005). Rethinking task-based language learning: What we can learn from the learners. Language Teaching Research, 9(2).

Slimani-Rolls, A. (2009). Complexity and Idiosyncracy of Classroom Life. In T.

Yoshida, H. Imai, Y. Nakata, A. Tajino, O. Takeuchi & K. Tamai (Eds.), Researching Language Teaching and Learning: An integration of practice and theory (pp. 57-75). Bern: Peter Lang.

Stenhouse, L. (1975). An Introduction to Curriculum Research and Development. London: Heinemann.

Tudor, I. (2001). The Dynamics of the Language Classroom. Cambridge: Cambridge University Press.

Wu, Z. (2004). Being, understanding and naming: Teachers' life and work in harmony. International Journal of Educational Research, 41, 307-323.

Zeichner, K. M., & Noffke, S. E. (2001). Practitioner Research. In V. Richardson

(Ed.), Handbook of Research on Teaching (4th ed., pp. 298-330). Washington: American Educational Research Association.

Zhang, R. (2004). Using the principles of Exploratory Practice to guide group work in an extensive reading class in China. Language Teaching Research, 8(3), 331-345.

	Monday	Tuesday	Wednesday	Thursday	Friday
9.30-	Language	Language	Language	Academic	Academic
11.00	Development	Development	Development	Reading Skills	Project
11.30-	Academic	Academic	Accuracy in	Academic	Academic
13.00	Listening Skills	Writing Skills	English	Writing Skills	Writing Skills
14.00-	Seminar Skills	Options:	Options:	Options:	Independent
15.30		IELTS or EP	IELTS or	IELTS or EP/	study
			British Culture	British Culture	

# Appendix I: Sample timetable for P3

# Appendix II: What puzzled the participants?

Name	Nationality	Background	Puzzle
(pseudonyms)			
Bella	British	14 years of TESOL experience	Why can't Middle Eastern
		(including 10 yrs EAP)	students spell?
Jenny	British	8 years of TESOL experience	Why do students find it difficult
		(including 5 yrs EAP)	to remember or to recall
			vocabulary?
Ahmad	Saudi	6 months of EAP study in UK	Why can't I study in certain
	Arabian		situations?
Ted	Japanese	6 months of EAP study in UK	Why do people learn bad words
			[= swear words] more easily?
Chiho	Japanese	6 months of EAP study in UK	
		New arrival in UK	Why can't I speak English like I
Yumi	Japanese	New arrival in UK	think?
Kai	Japanese		
Kelly	Japanese	New arrival in UK	Why are Japanese good at writing
			and Saudi Arabians good at
			speaking?

	Planning meetings	Activity	Interviews with teachers	Interviews with learners
Week 1PlanningAnticipatingmeeting 1:Bella1 &Jenny		Course induction	Bella (1a)	
Week 2 Puzzling		Presentation introducing EP. Participants invited to think about what puzzles them.	Jenny (1b)	
Week 3 Planning meeting 2: Jenny		Learners form groups around puzzle areas.	Jenny (2b)	
Week 4 Exploring		Participants investigate what puzzles them.	Bella (2a)	Six learners, including Ted (1i)
Week 5		Participants collect, collate & analyze data		
Week 6		Participants collect, collate & analyze data	Jenny (3b)	Six learners, including Ted (2i)
Week 7 Disseminating		Learners give group poster presentations to class.		
Week 9 Reflecting		Learners write group assignments on their EP work.	Jenny (4b)	Two learners, including Ted (3i)
Week 10		Learners hand in assignments. Teachers mark assignments.	Bella (3a)	Interviews with remaining four learners.
Week 11		Teachers give back assignments with comments.		

 Table 1: Implementing EP on P3

<sup>&</sup>lt;sup>1</sup> Pseudonyms are used throughout.