

An Ethnographic Intervention using the Five Characteristics of Effective Teacher Professional Development

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This paper is aimed to describe an ethnographic intervention study of supporting a Low Use Internet (LUI) teacher to use the Internet for his professional development. Five characteristics of effective professional development were identified and applied. This description is followed by a reflection on the process to get a deeper insight about factors that could support and restrict teachers in making positive changes in his mathematics teaching.

Ethnography means literally to write about people (Burns, 2000) or to create a picture of a group's "way of life" (Wolcott, 1988, p. 188). In a more focused sense, ethnography is fundamentally an effort to find out about a group of people to be able to describe their socio-cultural activities and patterns (Burns, 2000; Freebody, 2003).

As a qualitative research method, ethnography was initially used in sociology research and particularly in anthropology. Its purpose was to uncover social, cultural, or normative patterns of a particular culture. Yet, this method has been accepted by many educational researchers as a tool to gain a rich insight about what actually happens in identifiable situations in education, such as in a classroom or in a school (Freebody, 2003; Hammersley, 1990). Ethnography is also commonly used in research on mathematics education (e.g., Millroy, 1992).

According to Burns (2000), ethnography tries to capture the complexity of "something" using multiple techniques instead of describing the ideal or imaginary condition. Ethnography aims to report this situation in a sensible way. Further, according to Wolcott (1988), ethnography attempts to discover what actually happens in real situations. Therefore, ethnography needs to investigate from inside the context, that is, in its natural setting. This means that the researcher, to some extent, may take part in daily activities in a chosen setting.

In contrast to typical quantitative methods, ethnography usually does not follow a pre-determined linear process (Burns, 2000; Wolcott, 1988). Therefore, it can only be planned beforehand in a general sense. The flexibility of ethnography becomes advantageous because it allows the researcher to capture the essence of social phenomena, which are usually very dynamic (Freebody, 2003). Ethnography can be conducted at single or multiple sites. The researcher needs to explore a site over time and raise new questions for further exploration (Freebody, 2003).

In ethnography, the researcher is directly immersed in the setting (Fetterman, 1989; Freebody, 2003). As such, as stated by Freebody (2003), two demands are placed on the ethnographic researcher: to act as an observer and data collector as well as a participant in the setting. This requires specific skills of the ethnographer as a key instrument within the study.

In this study, an ethnographic intervention was implemented. The term of *intervention* was used to indicate that in conducting this research, even though the researcher aimed to gain rich insight from inside naturally, the researcher particularly also intended to encourage a teacher to develop his professionalism by taking advantages of the internet.



This ethnographic intervention provided a more authentic PD (Professional Development) program and it was guided by the Five Characteristics Effective Professional Development (5cEPD) framework (Patahuddin, 2007). According to this 5cEPD framework, effective professional development: (1) is on-going; (2) is collaborative and aims to promote and connect participants in learning communities; (3) is student-oriented, focusing on student-centred approaches to teaching; (4) takes into consideration the individual teacher and his/her context; and (5) has as its prime focus the enhancement of pedagogical content knowledge. How this framework shaped the work of the researcher is discussed in this paper.

Design of the Study

Jack (anonymous) volunteered to take part in this study. He is a Year 2 teacher who had not made use of the Internet for professional development but had a willingness to do so.

I spent six months with Jack, visiting his classroom two to four days each week. Then I left his school but continued online communication. The purpose was to determine the extent to which Jack might use the Internet whilst I was not present. I returned to Jack's classroom after a break of approximately two months and stayed for a further two months. In total, I spent over 500 hours being a participant observer in Jack's classroom.

Multiple methods were used to gather data, namely questionnaire, interview, fieldnotes, written and non-written sources. The questionnaire and introductory interview were to gather information on his professional background, teaching approaches, the characteristics of the class environment, and to what extent he incorporates technology in general and the Internet in particular.

The questionnaires were supplemented by a face-to-face interview, with questions relating specifically to the items on the questionnaires. This interview was semi-structured, and occurred at the beginning of work with Jack. The semi-structured interview was for the purpose of seeking clarification of Jack's responses to the questionnaires. Unstructured interviews were implemented at strategic points throughout.

Fieldnotes were made by the researcher. These were supported by several videoed mathematics lessons. Informal discussions between Jack and researcher during and after classes were also documented.

Other data sources were printed and written sources. These included the mathematics syllabus, the ICT syllabus, notes about mathematical websites, and/or e-mail documents of professional communication. Non-written sources included lists of Internet "favourites" on the classroom computer and/or tracking of teachers' steps in using the Internet via the "history" in the websites.

Data analysis of this study referred to what Hammersley and Atkinson (2007) stated below.

In ethnography, the analysis of data is not a distinct stage of the research. In many ways, it begins in the pre-fieldwork phase, in the formulation and clarification of research problems, and continues through to the process of writing reports, articles, and books. Formally, it starts to take shape in analytic notes and memoranda; informally, it is embodied in the ethnographer's ideas and hunches (p.158).

An Ethnographic Intervention

My journey with Jack was not predetermined but emerged in response to my daily interactions with him, which were shaped by the research on effective professional

development programs using the Internet and the nature of the ethnographic approach. My aim was to assist Jack to reach the point where he would continue to develop his skills and expertise in using the Internet over time.

My work with Jack was characterised by five distinct phases. In Phase 1, at the beginning, I actively identified online resources and organised them into blogs, unobtrusively demonstrating a way of working with students in groups using the Internet, and showing directly several mathematical websites. My aim in Phase 1 was to capture Jack's interest in the use of the Internet for learning and teaching mathematics. In the second phase, Jack started to search for websites, sharing websites with other teachers, as well as presenting particular websites to other teachers in his school workshop. However, in this phase, Jack and I faced some challenges in facilitating the use of the Internet by students for their learning. Phase 3 was characterised by feelings of frustration. Jack seemed to think I was there to help the students in the classroom, leaving me feeling that, while I expected Jack to engage with the Internet, he wanted me to do it for him. I made a time to talk with Jack so that I could clarify the direction of my work. An outcome of this interview was me locating websites to match Jack's teaching program (Phase 4). This was a task I did not want to do. However, this received most positive feedback from Jack about my time in his classroom. In the last phase, after leaving Jack's classroom for about two months I continued e-mailing websites, but Jack did not reply to any of my e-mails. When I returned to his classroom, however, I found several significant changes in Jack's use of the Internet in his mathematics teaching.

Although it seemed that this teacher developed only slowly in his use of the Internet, if at all, the findings are significant in underscoring the non-linear, interactive and contingent nature of authentic professional development, particularly in finding appropriate time and methods in promoting the use of the Internet. Even though this authentic professional development program did not optimise Jack's use of the Internet as his learning and teaching tool, this research did support Jack to see and experience the potential of the Internet.

An Ethnographic Intervention with the 5cEPD Framework

This section discusses the study's substantive findings regarding this ethnographic intervention with the 5cEPD Framework.

Ongoing Professional Development

Effective professional development should be on-going (Abdal-Haqq, 1996; Little, 1993). The Internet can assist in this regard because its potential as a source of information and as a medium of communication enables teachers to find information anywhere, at any time. The Internet also enables teachers to communicate with other teachers, even allowing them to ask experts about teaching problems and issues. They do not have to wait for a workshop to get information and to share ideas with other teachers/educators (e.g., Dede, 2006; Stephens & Hartmann, 2004).

In relation to my work with Jack, there was evidence to show Jack continued his learning using the Internet. During my absence from his classroom, for example, Jack had explored websites I had identified for him (as he transferred them to the *Favourites* section of his computer). More exciting is the fact that, three months after completion of working with Jack, and during which time Jack had relocated overseas to another school, Jack emailed me, stating "I was just on your blog looking at some of your great resources." This

comment indicates that, after a significant period of time, he was still accessing the resources that I had compiled for him. These two positive signs are not sufficient to indicate clearly the longer term impacts of Jack's ongoing professional development strategies, but they provide evidence of a growing awareness of the professional development potential of the Internet for this individual teacher.

Despite these positive outcomes, one significant factor that inhibited and limited the process of ongoing professional development from a distance was my difficulty in establishing regular email communication with Jack, even though the Internet was available at his home and school. Emailing online resources to Jack often had uncertain results, particularly when Jack neither replied to my emails nor commented on the online resources provided. This demonstrates that, on the one hand, the Internet has much educative potential but on the other hand, using it can present new challenges to teachers. Having access to email involves additional work and time. Reading and replying to emails require time on the part of teachers who already have a busy schedule. The question is, under what conditions would teachers be able to benefit from accessing email?

Collaborative Professional Development

Many researchers claim that professional development is more effective when it is collaborative (e.g., Little, 1993; Wilson & Berne, 1999). One of the great potential advantages of the Internet is that it can be a tool for collaboration; for connecting teachers locally and globally to enable collaboration (e.g., Newell et al., 2002).

Effective professional development aims to promote and connect participants in learning communities (Abdal-Haqq, 1996; Little, 1993; Wilson & Berne, 1999). It must provide teachers with opportunities to interact with peers (Abdal-Haqq, 1996), and also to talk about specific subject matter, about students' learning, and about teaching (Wilson & Berne, 1999). It ensures collaboration by facilitating conversation among teachers which in turn leads to shared experience, shared investment in thoughtful development and a fair and rigorous testing of selected ideas (Little, 1993).

In designing the professional development program for Jack, I significantly considered the collaborative aspect. I attempted strategies such as seeking opportunities to connect Jack with existing online professional communities (e.g., Oz teacher and Math Forum). Jack appeared to work collaboratively, both with me or his colleagues, but hardly at all in the virtual world. Collaboration between Jack and myself was evident, for example, in the way investigative learning projects on multiplication were developed together. Jack's collaboration with his colleagues was illustrated on many occasions, such as when Jack and other Year 2 teachers worked together to plan their teaching program and when Jack shared information about websites in a workshop at his school and on several other occasions. However Jack seemed to find it more difficult to engage in online, rather than face-to-face, collaboration. It appeared that Jack much preferred the latter and this is supported by the following comment taken from a discussion with Jack:

From my experience, I don't think teachers at this school anyway would dedicate the time to do something online, because teaching, I suppose, is a social kind of job, not like a job in an office. I think, teachers value face-to-face interaction rather than using the computer for learning.

Given the supposed benefits of online collaboration, this finding raises the important issue of why Jack responded the way he did. Perhaps, the most intriguing issues to emerge are those of time, personal preference, and context. The personal situation of Jack, especially his busy schedule and his preference at this stage for face-to-face collaboration,

appeared to be the main factors for his not yet embracing the potential of the Internet as a collaboration tool for his professional development. In terms of his context, Jack was a beginning teacher who spent most of his time organising his teaching plans and he found in his school a very positive collaborative atmosphere among the teachers. I was available to support him directly. Jack may see little need to do online collaboration. Perhaps in a new situation, especially if he feels isolated, he may join a discussion group. It may be just a matter of time before Jack embraces the Internet as a tool for personal development because he lives in a growing digital environment.

Gibson and Oberg (2004) found that few teachers use the Internet for collaboration. The results of the present study may provide additional insight into the factors that influence the lack of teachers' use of the Internet to collaborate with others.

Student-oriented Professional Development

Teacher professional development is effective when student learning outcomes show improvement (Abdal-Haqq, 1996), hence professional development should be student-oriented in nature. The Internet can provide different learning resources to cater to different learning styles/ approaches. For example, the Internet provides virtual manipulatives, it can assist students visualise mathematical concepts, it provides a variety of representations of mathematical concepts, and it also provides mathematical games. Such a range of resources can assist teachers in understanding students' different learning approaches, and finding resources to cater to them.

My efforts in relation to Jack were designed to assist him to use the Internet to find professional resources compatible with both his instructional goals in mathematics and his students' needs. I worked with individual students using websites I had found and continually pointed out students' enthusiasm in learning mathematics when using the Internet. My work with students enabled me to identify different online learning resources that matched their strengths.

Jack's response was mixed. He attempted to use the Internet in his teaching, but this was through whole-class instruction and using the data projector.

... because I find it is easy with a data projector because you can do it for a whole class at once. And I think, they can all sit down, they can all see it rather than have them to use the computers. And then I think I prefer to do it that way then have the children back to their desks and doing an individual activity from there, like maths textbook or something from the board, as a consolidation because we only have four computers and I don't have time to supervise them all.

He wanted to allow students to work independently at the computers in their free time, but found that they needed continual assistance that he did not have time to give.

I've got four Internet programs, but some kids get to the end of the program and don't know what to do, or they have a problem, and then I have to stop what I am doing. Some times I am collecting notes and talking with kids and also trying to get my head around what I am trying to do for the day. I am getting my worksheets organised, or finding the roll, or doing million other things that need to be done. So, you know, having the computers there, having the games up for the kids to use, it's good but I don't have the time to really come over to them.

Jack indicated a willingness to engage students in learning with the Internet, but other factors appeared to inhibit him in such undertakings.

A positive aspect of student-oriented professional development is that I could directly locate Internet resources for individual students. Implementing the professional development model directly in Jack's classroom was a positive aspect, yet it did not have the desired effect. While many researchers argue that the Internet is a powerful tool for

enriching students' mathematics learning, many ICT professional development programs have failed to explain how teachers integrate what they learn in professional development programs into their classrooms (e.g., Gibson & Oberg, 2004; Gibson & Skaalid, 2004). Studies based on programs which take teachers outside of the classroom often fail to address the issue of compatibility with the actual characteristics of the students and their learning environment. The present research indicates the value of supporting teachers in their own classrooms. However, this is not sufficient, as offering new ideas to Jack seemed to compete with other classroom priorities and presented a challenge to his teaching style.

Considering the Individual Teacher and School Context

Borko, Mayfield, Marion, Flexer, and Cumbo (1997) and Abdal-Haqq (1996) suggested that professional development should take into consideration the classroom/school context of the teacher, and also treat teachers as active learners who construct their own understanding.

I made a conscious effort to treat Jack as an adult learner and a professional throughout this study, especially by valuing his constructive ideas. I often asked Jack's ideas/judgement on websites before offering them to students and he suggested several websites that I should offer to his groups of students. I also expressed my willingness to learn from Jack's experiences. In terms of context, I took note of the fact that Jack's classroom had four computers with good Internet connection but noted also they were rarely used by students for learning. I often thought of opportunities to propose the use of the Internet to enrich students' learning with students working in small groups at the connected computers. Also, knowing that Jack's school encouraged professional sharing among teachers, I suggested that Jack should share information about websites relevant to his mathematics teaching with other teachers teaching the same year levels and Jack responded positively, because he reported to me his websites presentation to other teachers in his school workshop.

However, considering the individual and the context proved to be very difficult in many ways. Understanding the individual teacher is a long process. Working with Jack for a period of approximately eight months, I had been gradually developing my understanding about him. I found that this changed over time. For example, on a critical occasion when I suggested that Jack could let students use the Internet during the morning period for free morning activities, I thought Jack could manage the activity as I had been giving him lists of websites relevant to his teaching programs. However, he found it too much of a challenge to organise the students. To sum up, this study suggests that understanding a teacher is not always a simple task and the level of understanding could influence the way we work with the teacher in a professional development program.

Enhancing Pedagogical Content Knowledge (PCK)

Effective professional development should enhance teachers' PCK, that is knowledge of multiple ways of representing mathematical content to students (Chick, Pham, & Baker, 2006). Little (1993) highlights that professional development should also focus on crucial problems of curriculum and instruction. The Internet can assist in this regard, through reading of other teachers' experiences, accessing professional reading material, discussing specific teaching problems with experienced teachers, or joining online conferences.

In my work with Jack, all strategies I used were part of my attempt to promote effective pedagogy in general, and PCK in particular such as teaching strategies for

promoting student learning of content. I did not have a specific or well-structured plan made in advance. Most strategies emerged as a result of ongoing observations and analyses of Jack's teaching context. For example, as I noticed that Jack often incorporated drill and practice, I suggested more investigative approaches and websites aimed at conceptual understanding and application of mathematical concepts. When I noticed Jack provided few activities that catered for various interest and ability needs of his students, I offered many different online resources for particular mathematical topics that he was teaching at the time. I also offered websites that contained some teaching ideas that had been developed by professional organisations.

Some positive changes were noted. We shared tasks in developing an investigative approach to teach multiplication. Jack's efforts in implementing an investigative approach led to discussions about the investigative problems and the ways technology could be integrated. Jack was seen to change some of his routines in the classroom. Jack was also seen to increase the use of the Internet as his own learning tool through his exploration of the websites I had listed in his program. However other aspects of enhancement were limited. Jack's undertaking of mathematics investigations resulted in children spending a lot of time drawing and colouring in rather than developing deep learning of multiplication concepts. Jack's notion of encouraging students to enjoy mathematics was through playing of games but his selection of games also seemed to provide little opportunity for deep learning. Jack's approach to assessment in mathematics was limited to tests of skills.

Despite these limitations, the aim to connect Jack to the educative potential of the Internet was partly achieved. It was always my expectation that he would take advantage of the Internet technology for his future professional learning, and the fact that he emailed me from his new school overseas "I was just on your blog looking at some of your great resources." suggested a continued use of the Internet that he may use in the future for greater individual professional development to challenge existing pedagogy and PCK.

Concluding Comments

In this study, the relationships between ethnography and 5cEPD are very strong. The 5cEPD is well-matched with the nature of ethnography. *Ongoing* professional development can be achieved since ethnography requires the researcher to conduct the study for a significant period of time. *Collaboration* is an element of 5cEPD and also a principle of ethnography, where the researcher who is living in the context must develop a good professional relationship with the participants and attempt to gain the trust of the teachers and students. A *student-oriented approach* can be applied since the researcher spends a great deal of time as a participant observer and getting to know students' characteristics and their mathematics learning needs. Additionally, *considering the individual and the context of the teacher* is possible to apply because the ethnographer must be inside the context. Lastly, *enhancing PCK* is the aim of this program. This process will be enhanced by the ethnographic research process, since observation and ongoing analysis of classroom practices for a protracted time enables the researcher to verify a teacher's actual understanding of concepts related to teaching. Thus, this design enables the researcher to gain access from the inside to the context and simultaneously to apply the 5cEPD.

This study further highlighted that teacher professional development is a complex issue. Even though the Internet-Authentic Professional Development Model was developed in consideration of the five characteristics of effective professional development (5cEPD), the model did not adequately explain some issues in the professional development process as I discussed more detail in the previous MERGA paper (Patahuddin, 2008).

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