Developing e-literacy in Ecuadorian secondary school English language teachers: applying TPACK to in-service course design

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Abstract

This dissertation explores the beliefs of a group of Ecuadorian secondary school English language teachers about the knowledge of technology that they consider necessary for their teaching practice. The Technological Pedagogical Content Knowledge (TPACK) framework suggests that teachers should develop a unique type of knowledge for effective teaching with technology, and is used as a reference in trying to determine if this group of teachers hold such knowledge. I begin this study by discussing the initiatives implemented by the Ecuadorian government aimed at improving the teaching of English, and an updated view on the integration of technology in educational settings in Ecuador. I continue with an explanation of the way in which data were generated by the application of an online questionnaire and further in-depth semi-structured interviews. I conclude with the presentation of findings and proposing a set of recommendations for in-service course design.
Declaration

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To Mum, for encouraging me not to lose hope…

To Dad, for making me realise that there is always time for a good laugh…

To Diego and Santiago, for inspiring me to be a better man…
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1. Introduction

In recent years, the Ecuadorian government has instigated a number of significant changes in education, implementing new policies which prioritise education and its actors in all levels. Establishing guidelines for the improvement of curricula and implementing programmes for teachers to engage in professional development opportunities are two of the most important initiatives. In line with this, the teaching of English is one of the areas which have been affected by these efforts.

1.1. The present landscape of English language teacher training and development in Ecuador

In an attempt to establish the level of minimum credentials an in-service English language teacher should possess, educational authorities in Ecuador worked on the development of the Ecuadorian in-service English Teacher Standards – EISETS – (Ecuadorian Ministry of Education, 2012). These standards have been designed based on the document “developed by the Teachers of English to Speakers of Other Languages (TESOL) as the organization’s K-12 ESL Teacher Standards (2009) which is widely used in countries such as Albania, Paraguay, and the United States” (EISETS, 2012:2). The Curriculum Development component of the EISETS states that English language teachers:

…in addition to the national textbooks, are familiar with a range of standards-based materials, resources, and technologies, and choose, adapt, and use them in effective English and content teaching. [They] use technological resources (e.g., the Internet, software, computers, and related devices) to enhance language and content-area instruction for students.

Additionally, between the years 2011 and 2012, the Ecuadorian Ministry of Education, upheld by the American Embassy in Ecuador, through its Press and Culture Section, embarked on a
project for the assessment of the curricula used in pre-service teaching programmes.

This process involved direct participation of the universities where an EFL or Applied Linguistics degree is offered. Delegates from the participating universities presented their views on what subjects should be highlighted and also on which other areas should be included, so that a more comprehensive syllabus could be introduced as a common framework for a more balanced approach to teacher training.

When looking at opportunities for continuous professional development in the area of English language teaching, the Ecuadorian government worked with Kansas State University, as programme administrator, the University of Kentucky, New Mexico State University, and Valparaiso University, all of these in the USA, to offer Ecuadorian English language teachers the opportunity to take part of the Go Teacher initiative. The University of Kentucky’s Centre for English as a Second Language describes the programme as follows:

This TESL professional development focuses not only on intensive English development through listening, speaking, reading, writing, and thinking, but also on those methodological, theoretical, and pedagogical elements of effective teaching. Special emphasis is placed on culture and language contexts, second language acquisition, cross-cultural communications, and applications to practice; a heavy emphasis is also placed on reading comprehension and writing within the context of effective pedagogy for English language learners.

The main purpose behind this training programme is to strengthen and restructure the teaching of English in Ecuador (SENESCYT, 2013). The programme comprises three core blocks; Culture and Language in Classroom Practice, ESL/EFL Methods, and Applied Linguistics/SLA. Although one of these blocks relates to English
language teaching methods, there is no mention of teaching technologies.

According to EISET standards, the teacher should use technological resources and appropriate methodologies for such purpose. Mind you, teacher training programmes and professional development opportunities, such as Go Teacher, still emphasise the development of linguistic and pedagogical skills, both in pre-service and in-service teachers. Freeman’s (1989) view is that fragmentation of language teacher education has resulted in neglect for a more coherent and comprehensive basis for programme design, which means that programmes fail to reach the standards they should be attaining.

With respect to the implementation of EISETS in Ecuador, one area of shortfall is teacher training, with a manifest lack of attention to the inclusion of a teaching technologies component. This contradicts current thinking reflected in, for example, the more contextualised approaches highlighted by the work of Prabhu (1990) and Kumaravadivelu (2006). Moreover, the emphasis shown by programme designers on more linguistic areas is still difficult to overcome, which makes the adoption of more comprehensive curricula for language teaching a difficult task. When language teaching is subject to scrutiny in Ecuador, there is a tension between how much the methodologies applied in this context pay attention to the inclusion of technology, and the extent to which those approaches are being put into practice.

1.2. Aim of dissertation

New curricula for teacher training and development programmes, such as the ones aforementioned, mean change and innovation in education in Ecuador. When this is imposed by the Government,
this brings about the argument of top-down dispositions. Fullan’s comments on the failure of social reforms can be applied to the Ecuadorian case because although the current reform efforts appear promising, “neglect of the phenomenology of change – that is, how people actually experience change as distinct from how it might have been intended – is at the heart of the spectacular lack of success of most social reforms” (2007:8). Furthermore, as Bates establishes, there is also a need to carefully consider time constraints when it comes to the implementation of reforms:

We are no more than twenty years into the so-called information revolution. Such revolutionary changes have to progress at a rate that can be absorbed by human beings, and in the case of education this means being absorbed by teachers, administrators, and students… changes suggested will need to be implemented over a period more like ten years than one or two years. (2003:2)

In light of this, the aim of my research is to provide the people responsible for making decisions about teacher training and development programmes, a set of contextualised recommendations which could be taken as a guideline for in-service course design, based on teachers’ beliefs.

1.3. Research questions

As my study aims to identify teacher knowledge and beliefs, I have decided to pay attention to the Technological Pedagogical Content Knowledge (TPACK) model (Koehler and Mishra, 2006) which describes the skills a teacher should possess for them to use technology in their practice in a more effective way. For this study I would like to assess the way respondents perceive their knowledge of pedagogy, content, and technology, both individually and as an intertwined unit, based on the TPACK model.

Therefore, the research questions which guide this study are:
1. What technological knowledge do Ecuadorian teachers in secondary school perceive as necessary to ELT?
2. Do these teachers hold such knowledge?
3. What beliefs do Ecuadorian ELTs hold about the use of technology in their teaching practice?

I hope that the answers to these questions will further my understanding of teachers' perceptions and use of technology. I expect that the framework I plan to introduce will serve as a tool for teacher trainers and development programme designers to create solutions to, for example, reluctance to the use of technology in lessons in a more direct way, and not only as a response to top-down implementations. As the research process advances, and after problem areas have been identified, my proposal, i.e. recommendations for in-service course design will be based on them so that the inconveniences English language teachers currently have with using technology could be dealt with more efficiently.
2. Literature Review

2.1. On the integration of ICT in education in Ecuador

In Latin American countries, the past two decades have witnessed great efforts towards the integration of ICT in public education (Ramírez, 2005; Carrillo & Ponce, 2009; Jiménez, 2010). Research in this area has mainly been descriptive concentrating on the fact that ICT offers a vision of progress which is directly associated with long term economic growth. As a result, the use and implementation of technology in educational scenarios is expected to help the so called developing countries such as Peru, Colombia, Ecuador, among others, develop into first world ones (Jiménez, 2010).

In a study conducted by the Centre for Information and Society (CIS) of the University of Washington, Bossio and Sotomayor (2009) make a direct reference to the amount of money the Ecuadorian government has allocated to education: $923.20 million in 2006 and $1190.80 million in 2007, representing 9% of central budget in each of those years. They establish “Ecuador’s potential for improvement in ICT as ‘steady gains’”. However, their report also emphasises the fact that access to ICT is still subject to a number of barriers, such as geographical constraints, connectivity, technological infrastructure, and limited IT skills on the part of the beneficiaries (students and teachers).

Carrillo and Ponce (2009) evaluated the Más Tecnología Colegios programme, an initiative launched in May 2009 in the city of Guayaquil, the biggest in Ecuador, and one of the most important ports on the Pacific Coast. The target population are secondary school students and teachers in 125 municipal schools. This programme is managed by the NGO E-ducate, and is especially focussed on infrastructure, software, and comprehensive plans for
teacher training. It aims at providing participant teachers with the necessary IT skills to enable them to track students’ progress. However, this was only a descriptive study which assessed the programme before it started proper work. In a similar project which was implemented in Quito, Ecuador’s capital, Granda (2011) describes the programme run by Quito’s Municipality, through its educational network, Educanet. This project also aims at providing secondary schools with infrastructure, and training for the teachers of the participant schools. Once again, the constraints for the introduction of technology were similar to the ones described in the CIS report, i.e. access to technological infrastructure, and limited knowledge on the efficient use of IT; especially due to the fact that limited budgets have not allowed the same amount of provision of infrastructure in all the educational centres, nor an adequate training programme for teachers.

On the premise that governments make great efforts to implement ICT in education, but no real evidence of success – or failure – is provided in the form of feedback or research, and as part of her own research for her doctoral thesis, Chiluiza (2004) worked on the implementation of an ICT-based training programme for primary school teachers. This longitudinal study took place over a two-year period and was supported by the Escuela Politécnica del Litoral (ESPOL). It was developed in 20 primary schools in the Santa Elena peninsula, another coastal city to the west of the country. The aim of this proposal was to assess pupils’ learning outcomes and teachers’ actual teaching by examining in-service teacher training, deployment of computing laboratories, and technical and educational support for teachers. As the author concluded:

…there was a significant positive impact of the Innovation of Education in the Santa Elena Peninsula (IEPSE) teacher training on instructional practices in the Ecuadorian primary schools involved in the study. The
IEPSE training programme has changed the way participating teachers teach and think about their own teaching. But it was also stated that these changes are still small.

The most recent initiative, which is deemed as a more inclusive one due to the number of centres created since 2008 – fifteen in total, in thirteen out of twenty-four provinces – is the project *Unidades Educativas del Milenio* (UEM). In Ecuador, the 2009 – 2013 National Plan for Good Living established “the promotion to have access to information and to new technologies of information and communication so that people could be incorporated in the information society and strengthen their citizenship” (my translation).

The UEMs are described as high level, public experimental schools, which are based on technical, administrative, pedagogical, and modern architectural concepts (National Plan for Good Living, 2009). Among the pursued aims of the UEMs are providing quality education, improving schooling conditions, access and coverage of education in its zones of influence, and developing an educational model which responds to local and national needs. All these schools have been built in rural areas, considered ‘educationally vulnerable’ but strategic, where the provision of technology signifies an attempt to offer better schooling conditions.

In their paper, Reinoso and Tintin (n.d.) take a close look at *Bicentenario*, one of the UEMs, located in the area known as Turubamba, in the province of Pichincha. They focus on just one of the centres due to the fact that all of them have been created following the same guidelines, and because *Bicentenario* was the first to start work, in 2008. In this model centre there are three computer clusters, of thirty computers each; teachers have access to laptop computers and projectors so that they can use them at any time and twelve smart boards have been distributed to be...
used in the initial years. Additionally, there is a library where students have access to an extra eighty laptops. This is all evidence of how the ample provision of technology. Would there be any constraints in this ideal setting? According to Reinoso and Tintin’s findings, some teachers are still reluctant to using technology in their lessons, while others seem to be using it, but not as an aid through which they could transform their own teaching practices. Furthermore, authorities in the school were interviewed and they seem to be unfamiliar with better teaching practices that include technology. According to the interviewed directors, if all this technology is available to teachers in their classrooms, they should use it, and find novel ways of doing so.

The above review has provided me with two important facts. First, there is a remarkable interest on the part of authorities to make technology accessible for both teachers and students, from initial schooling levels. Second, though steps have been taken in the right direction there is still a great deal of work to be done when it comes to training teachers, not only on efficient practices related to the use of technology, but also on finding a way to make them realise the underlying principles of its use. This understanding would help them change their beliefs about the use of technology and, as an expected outcome, enhance their teaching practice.

2.2. Teachers’ beliefs

Current educational models have changed their approaches to teacher education significantly. Fang (1996:47) makes clear that “research on teaching and learning has shifted from a unidirectional emphasis on correlates of observable teacher behaviour with student achievement to a focus on teachers’ thinking, beliefs, planning and decision-making processes”. It is important to be aware of the fact that what a teacher believes in is to be considered their teaching philosophy, and this definitely has
an impact on students’ behaviour and academic performance (Pajares, 1992; Fang 1996). Likewise, it is necessary to try to articulate an understanding of language teachers’ beliefs about innovation, especially when those innovations include the adoption of new ways of teaching.

2.2.1. Defining beliefs

If we are to understand a teacher’s beliefs, we should first possess a more precise definition of what a belief is. It is essential to make a distinction between beliefs and other forms of knowledge (Nespor, 1987). However, coming across such a definition is not that easy. As Pajares (1992:309) puts forward about the definition of beliefs:

They travel in disguise and often under alias – attitudes, values, judgments, axioms, opinions, ideology, perceptions, conceptions, conceptual systems, preconceptions, dispositions, implicit theories, explicit theories, personal theories, internal mental processes, action strategies, rules of practice, practical principles, perspectives, repertoires of understanding, and social strategy, to name but a few that can be found in the literature.

For Nespor (ibid.) “…belief systems are less malleable or dynamic than knowledge systems. Knowledge accumulates and changes according to relatively well-established canons of argument. Beliefs, by contrast, are relatively static”. Knowledge is subject to straightforward evaluation and judgement, whereas an individual’s (i.e. a teacher’s) mental constructs on a topic cannot be directly manipulated. If anything, they may be ‘renovated’ over the course of time. Hence, a teacher’s beliefs may well be defined as the mental constructs (generated prior to an experience, during the experience or after reflection on that same experience) they possess about their own teaching
practice, students’ attitudes, programme design, educational policies, and technology integration, among others.

2.3. Teachers’ beliefs on the integration of technology in their practice

Over the last fifteen years, educational research has provided ample support for the assertion that the majority of attempts to integrate technology within educational settings have been top-down. Decisions pass down the ladder from central government to local government, school boards to course designers… and finally teachers, who are expected to apply what has been decided without question. Nonetheless, those in charge of introducing innovative technology with educational purposes should pay close attention to the complexity of such a process. The teachers who will be the beneficiaries and managers of the new technology should be involved in the preparation of courses (Hayes, 1995). As Murray and Christison suggest, “innovation is a highly complex process, because different individuals and cultures have different attitudes towards and beliefs about innovation” (2012:61).

On the basis of the evidence currently available, it seems fair to suggest that among the fundamental factors affecting successful technology integration, the pedagogical and personal beliefs of teachers play a key role (Funkhouser and Mouza, 2013). Therefore, even if teachers do appear to be knowledgeable regarding the application of technology within the classroom, it cannot be assumed that their use of technology in lessons will be successful. Supporting this argument, Funkhouser and Mouza stated that “knowledge and skills alone are not sufficient conditions for effective technology use”. Therefore, training programme designers who promote the integration of technology in schools should prepare teachers to produce lessons that encourage students’ critical thinking and use of technological aids,
i.e. computers, multimedia, the Internet, virtual learning environments (VLEs)... as tools to help them progress in their learning (Lowther et al., 2008). Following a shift in lesson planning to incorporate technology, efforts must be made to achieve a similar shift in teachers’ attitudes, given that “changes in practice do not always mean changes in beliefs” (Tatto, 1998:66). In this respect, standards in education, which attend to the different contexts where they are introduced, must be applicable to the extent of beliefs and practice, and not only because they are seen as roles that teachers must comply with.

Likewise, both teacher trainees and in-service teachers need to be completely aware of the purposes of their own educational setting. The fact that those purposes can shape teacher’s beliefs about suitable teaching practices and conceptions of their professional role creates a direct link to students’ outcomes (Tatto, 1998). As Ertmer et al. (2012:423) explain:

…researchers investigating the relationship between teachers’ beliefs and student-centred learning described a common pattern of results: teachers with constructivist beliefs tended to use technology to support student-centred curricula; those with traditional beliefs used computers to support more teacher-directed curricula.

Ertmer (1999) classified two types of barriers which influenced teachers’ use of technology. The first group, called First-order barriers, included factors external to the teacher such as resources (both hardware and software), training and support. In the second category, Second-order barriers, internal aspects were analysed: teacher’s confidence, beliefs about how students learned, the perceived value of technology in their teaching practice, and their students’ learning. This second group of barriers provides confirmatory evidence that teachers should be helped to produce and internalise a corpus of beliefs which guide
their practice and at the same time, makes them feel at ease and supported when using technology in their lessons.

2.4. Teachers’ beliefs and the implementation of technology training programmes

On the above grounds, taking into account teachers’ beliefs and perceptions for the creation of training and development programmes is increasingly important. As Malm (2009) supports, it has become progressively more difficult to ignore the cognitive, social, and emotional factors which must be considered when teacher professionalization is sought after. Additionally, I am not alone in my view that any development opportunities offered to teachers also have repercussions on students’ learning. Borko, Jacobs and Koellner agree that “if we want schools to offer more powerful learning opportunities for students, we must offer more powerful learning opportunities for teachers” (2010:1). Thus, if a teacher’s personal disposition, i.e. teacher’s self, are fundamental in the design of training programmes, which other factors should be considered by designers (teacher trainers/educators; educational authorities...) for the success of any development endeavours? Barber and Mourshed’s (2007:13) assertion is an interesting starting point:

Although it is true that the system’s context, culture, politics and governance will determine the course which system leaders must follow, the cumulative experience of high-performing systems indicates that focusing on three drivers is essential for improving student outcomes and, more importantly, that reform efforts which fail to address these drivers are unlikely to deliver improvements in outcomes that system leaders are striving to achieve.

In summary, these three drivers are;
a. The quality of an education system cannot exceed the quality of its teachers. Even if resources are available, and provision of better working conditions for the teacher, such as smaller classes, better equipped classrooms, good (or acceptable) salaries exist, the system where initiatives are implemented must make strong and coherent connections between what is on paper to what is to be done, and, more importantly, to what is really happening in the classroom. High-achieving teachers offer their students the chance to also become high-achievers; consequently training and development programmes must look for ways to ensure all teachers meet the criteria established in general teaching and performance standards (e.g. EISETS in the Ecuadorian case). A steady balance must exist so that, possibly, all teachers attain the same high level of performance.

b. The only way to improve outcomes is to improve instruction. This can only be achieved by knowing what is happening to the teacher, in their classroom. When problems arise in pedagogy, content, and provision of resources, for example technology, a solution and remedy must be found. A mentor – or coach – should become a source of support for teachers. Additionally, this person(s) could draw attention to even more development for those teachers who demonstrate leadership skills. Eventually, those teachers could become mentors themselves, head teachers, or other important support figures in their workplace.

c. Achieving universally high outcomes is only possible by putting in place mechanisms to ensure that schools deliver high quality instruction to every child. Constant monitoring and assessment of both teachers’ practice and students’ performance is to be duly carried out. When difficulties appear, especially in students’ learning, appropriate interventions must take place so that no student falls behind.
2.4.1. On teachers’ experience and reflection

The premise that a teacher learns to teach through real, on-site practice is not new. Hence, pre-service teacher instruction must create a close connection to classroom practice, which means that a practicum period should be allocated before the graduate teacher starts working (Van Eekelen et al., 2006). Prospective trainees, pre-service and in-service teachers need to make sure they want to commit to learning to teach, since this is a lifelong enterprise (at least for those individuals who do not decide to leave teaching). Furthermore, teachers’ beliefs are founded in early years of practice and this can be really difficult to change, even if external factors demand that the teacher in question submits to programmes of change and innovation (ibid.)

To sum up, practice means learning from experience and reflection. Andresen, Boud and Cohen set the ends of education as the most important criterion to be taken into consideration for experience-based learning (EBL). As the authors suggest, “the ultimate goal of EBL involves learners’ own appropriation of something that is to them personally significant or meaningful” (2000:226). A professional development programme that takes into account teachers’ ideas, beliefs, attitudes (Wallace, 1991:50) expectations, fears, and doubts could make its participants feel new groundwork their own, resulting in a more enjoyable teaching experience. Andresen, Boud and Cohen also state that “learners analyse their experience by reflecting, evaluating and reconstructing it (sometimes individually, sometimes collectively, and sometimes both) in order to draw meaning from it in the light of prior experience…[and] this review of their experience may lead to further action” (2000:225). Hence, reflection accounts for a very important aspect in teacher education programmes.
Helping teachers become reflective practitioners should be one of the most important aims for training and professional development programme designers.

2.5. Technological Pedagogical Content Knowledge (TPACK), a model for effective technology integration

Based on Shulman’s construct of pedagogical content knowledge (PCK; 1986), and encouraged by the need of a more comprehensive model for effective technology integration into learning environments, Koehler and Mishra developed the Technological Pedagogical Content Knowledge framework. As the authors claim “the development of TPACK by teachers is critical to effective teaching with technology” (2009:60). Both PCK and TPACK are easy to understand at a conceptual level, and even though TPACK presents a hidden degree of complexity, many researchers recognize the broad appeal and potential of the latter (Graham, 2011).

2.5.1. The foundations of TPACK: Understanding Pedagogical Content Knowledge

Shulman’s introduction of pedagogical content knowledge (PCK) in 1986 was an attempt to deal with the problem of having teacher development programmes, and their particular assessment processes, focusing mostly on teachers “teaching and learning to teach” (Ball and McDiarmid; 1989:1). Emphasis was given to finding out how effective pedagogical methods were, independent of teachers’ knowledge of subject matter for their teaching practice.

Shulman envisioned a “coherent theoretical framework” (1986:9) in which content knowledge embraced knowledge of the subject matter to be taught, knowledge of pedagogy, and
curricular knowledge (having Shulman established that curricular knowledge is included in pedagogy knowledge). When these types of knowledge merge, pedagogical content knowledge is said to exist. Nonetheless, Ball and McDiarmid draw attention to the fact that understanding the constructs in PCK requires a clear appropriation of the concepts it embraces. They especially emphasise the importance of subject matter for teaching:

Helping students learn subject matter involves more than the delivery of facts and information. The goal of teaching is to assist students in developing intellectual resources to enable them to participate in, not merely to know about, the major domains of human thought and inquiry. These include the past and its relation to the present; the natural world; the ideas, beliefs, and values of our own and other peoples; the dimensions of space and quantity; aesthetics and representation; and so on (1989:2)

Therefore, it becomes necessary to dedicate a good amount of time and effort to fully understand Shulman’s arguments so that arriving at a complete understanding of TPACK does not become a problem. As Graham (ibid.) also establishes, a number of studies have introduced different definitions for the constructs of TPACK, which might be in line with Koehler and Mishra’s work, but that pose a risk of arriving at misconceptions.

2.5.2. Understanding TPACK

Figure 1 represents Shulman’s conceptualisation of pedagogical content knowledge. The two Venn diagrams characterise content knowledge and pedagogy knowledge, being PCK the area resulting by their intersection. One important consideration is that of understanding that the level of knowledge of the two areas is different in every teacher, and that the resulting PCK – when there is evidence that it exists – will differ, especially because a precise measure of these two
types of knowledge is difficult to determine (Mishra and Koehler, 2006; Koehler and Mishra, 2007; Angeli and Valanides, 2009; Graham, 2011).

Figure 1. Representation of Shulman’s Pedagogical Content Knowledge (PCK).

For the development of TPACK, Koehler and Mishra added another big area to Shulman’s PCK, i.e. technology. They established that for a teacher to be able to teach efficiently with technology, a combined, unique knowledge of pedagogy, content and technology should be part of a teacher’s knowledge base. Figure 2 shows the addition of the third area, and the constructs that Koehler and Mishra proposed as the results of such process. Table 1 introduces a summary of the constructs of TPACK, as explained by Mishra and Koehler (2006).

An interesting theoretical framework, TPACK presents two big challenges; understanding its constructs to the point of not misconceiving their real meaning, and finding an appropriate way of measuring it. As their work on the development of the framework has progressed, even Koehler and Mishra have come across difficulties in determining what a good instrument for assessing a teacher’s TPACK would be. The TPACK
Survey proposed by Schmidt et al. (2009) is an example of the tools which have been developed and used in trying to gauge this type of knowledge more accurately.

![Diagram of Technological Pedagogical Content Knowledge (TPACK)](image)

**Figure 2.** Technological pedagogical content knowledge (TPACK).
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Additionally, it has been argued that if a teacher’s level of knowledge of content, pedagogy or technology increases, so will the teacher’s TPACK (Koehler, Mishra and Yahya, 2007). Even though a direct relation of proportionality might be accepted, it is still difficult not to continue thinking of TPACK as more precise as a framework, and not completely concise in practice.

Nonetheless, Jaipal, Figg, and Burson (2012) put forward the view that for teacher educators, especially the more technology oriented, TPACK represents a valuable resource to use as a base for depicting that unique type of knowledge that Mishra and Koehler ventured to introduce. For the purposes of my study, TPACK has become a good starting point to try to
understand better if English language teachers possess a level of technological knowledge which could aid them in using technology in an effective way as part of their practice.
### Table 1. The constructs of TPACK, summarised (Mishra and Koehler, 2006)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedagogical knowledge (PK)</td>
<td>Deep knowledge about the processes and practices or methods of teaching and learning and how it encompasses, among other things, overall educational purposes, values, and aims. This is a generic form of knowledge that is involved in all issues of student learning, classroom management, lesson plan development and implementation. It includes knowledge about techniques or methods to be used in the classroom; the nature of the target audience; and strategies for evaluating student understanding.</td>
</tr>
<tr>
<td>Content Knowledge (CK)</td>
<td>Knowledge about the actual subject matter that is to be learned or taught, including knowledge of central facts, concepts, theories, and procedures within a given field; knowledge of explanatory frameworks that organize and connect ideas; and knowledge of the rules of evidence and proof (Shulman, 1986).</td>
</tr>
<tr>
<td>Technological Knowledge (TK)</td>
<td>This includes knowledge of operating systems and computer hardware, and the ability to use standard sets of software tools such as word processors, spreadsheets, browsers, and e-mail. TK includes knowledge of how to install and remove peripheral devices, install and remove software programs, and create and archive documents.</td>
</tr>
<tr>
<td>Pedagogical Content Knowledge (PCK)</td>
<td>PCK exists at the intersection of content and pedagogy. Thus, it goes beyond a simple consideration of content and pedagogy in isolation from one another. PCK represents the blending of content and pedagogy into an understanding of how particular aspects of subject matter are organized, adapted, and represented for instruction.</td>
</tr>
<tr>
<td>Technological Pedagogical Knowledge (TPK)</td>
<td>Knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Technological Content Knowledge (TCK)</td>
<td>Knowledge about the manner in which technology and content are reciprocally related. Although technology constrains the kinds of representation possible, newer technologies often afford newer and more varied representation and greater flexibility in navigating across these representations</td>
</tr>
<tr>
<td>Technological Pedagogical Content Knowledge (TPCK)</td>
<td>TPCK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students’ prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones</td>
</tr>
</tbody>
</table>
3. Methodology

Selecting a specific research methodology for the study of a phenomenon may not be as easy a task as deciding on the phenomenon itself. The design of a research plan, for which a sound methodology is adopted, is one of the aspects to which the researcher needs to devote a great deal of attention. A number of authors praising quantitative over qualitative methods may make the selection process even more difficult, generating confusion over how to proceed (Sechrest and Sidani, 1995; Maxwell, 2004). As a result, the researcher may opt for a combined methodological approach. As Sechrest and Sidani claim, there is “continuing controversy over quantitative versus qualitative methods… [nonetheless] the two approaches are complementary” (1995:77). In all, the factor driving the decision over which methodology to work with is being able to offer the best possible answer to the research questions and, consequently, achieving the aim of the research.

Based on this last argument, and given that I was about to explore teachers’ decision making, and the beliefs behind those decisions, I decided to implement a combined research approach for my methodology. I divided my research into two main stages of data generation; the application of an online questionnaire, which offered me initial data to probe for the areas which I could enquire about, and try to understand better in follow-up semi-structured interviews, conducted in the second stage.

The following sections will explain the selection of a questionnaire and a semi-structured interview as the research tools, and the reasons to choose and adapt the TPACK Survey (Schmidt et al., 2009) as my initial collection tool. The bases on which respondents were selected to be interviewed are also presented.
3.1. Understanding survey as a research methodology

The terms survey and questionnaire have widely been used interchangeably. However, for a clear understanding of the design of the methodology in this study I consider important to establish the difference between survey, as a research methodology and a questionnaire, as in instrument for data collection (Glasow, 2005; Trochim, 2006).

The survey is the actual methodology, which in essence comprises the steps to be followed for the completion of the research project. The questionnaire, on the other hand, is a component of this methodology. As noted by Thomas (2009:135) “in a survey you are collecting data from a varied number of respondents... They may be responding in a [written] questionnaire or in an interview…” Thus, a survey is a methodology for data collection of which questionnaires (deployed, for example, on the Internet) and interviews are techniques. Survey research methodology may include the initial design process – together with the selection of research tools – pilot study, sampling, data collection, and final data analysis.

3.2. The selection and adjustment of TPACK Survey

For this study, I conducted a survey of 17 respondents. The questionnaire is an adapted version of the TPACK Survey (Schmidt et al., 2009) which can be accessed at www.tpack.org. As Schmidt et al. explain the initiative behind the development of this questionnaire was “to develop a survey instrument to measure each of the seven components of TPACK”. Since this instrument has already been used and tested (ibid.), it offered me the opportunity to work with a questionnaire whose validity has been confirmed. Cannell et al. (2004) put forward the
view that the survey questionnaire must be thoroughly revised, and a number of versions designed and improved before the final set of questions is accepted and distributed among possible respondents. A pretest stage, i.e. piloting the questionnaire, is necessary, so that final respondents do not experience problems when answering the questions. These problems could include lack of clarity in the questions, misunderstanding of terms due to complexity, badly worded questions, and biased questions, to mention a few.

My version of the TPACK Survey, *Understanding the role of technology in our teaching* (Appendix B), contained 31 Likert-type items, a procedure used to measure character and personality traits which include attitudes (Likert, 1932; Komorita, 1963). For these questions I used a scale from strongly agree to strongly disagree. These 31 questions were grouped according to the seven constructs of TPACK. These constructs then became seven categories for later analysis (Boone and Boone, 2012). The aim of this set of questions was to probe into teachers’ beliefs by encouraging respondents’ reflection on the decisions they make when using technology. The gathered data would offer me some insights on aspects such as respondents’ familiarity with pedagogical approaches which may promote the integration of technology, and also the way in which their own teaching might be transformed by such integration process.

An open-ended question (Appendix B, 32) was also included. I used this question to explore the way in which the respondents may be already using technology in their lessons, the content they intend to teach, and the methodological approach they have in mind for this purpose; but also to identify reasons why they may not be doing so. As Goodrich claims “Open-ended survey questions promise a wealth of information to the researcher who can properly process the responses... open-ended survey
questions do not restrict the respondent’s ability to fully express herself” (2008:4). The answers for this last question helped me to continue with the second stage of my research, which was interviewing three specific respondents. As the starting point behind the selection of my methodological approach was to examine teachers’ beliefs (RQs 1 and 3), the answers to this question touched upon the areas that I could include and discuss in the subsequent semi-structured interview, and also helped me to decide who to interview.

3.2.1. Deploying my version of the TPACK survey online

A very important characteristic of implementing surveys at present is the perceived ease with which questionnaires can be delivered to respondents via the Internet (Cook, Heath and Thompson, 2000; Opdenakker, 2006). Birnbaum (2004:804) recognises some of the benefits of using online questionnaires for research:

Surveys and experiments can be delivered quickly to anyone connected to the Web and data can be saved automatically in electronic form, reducing costs in lab space, dedicated equipment, paper, mailing costs, and labour. Once an experiment or survey is properly programmed, data can be stored in a form ready for analysis, saving costs of data coding and entry that used to be an expensive and time-consuming part of the research process.

As the respondents of my survey would be in Ecuador, and bearing in mind the aforementioned benefits, I decided to create and administer an online questionnaire. For this purpose I used the Faculty of Humanities’ On-line Survey Software Version .NETv4.044.000, of the University of Manchester. This software offers the possibility of creating questionnaires containing different types of questions (multiple-choice, open-ended, close-ended…), and more importantly, it provides the
data description – the survey metadata – which facilitates data analysis (Martin and Manners, 2004).

The respondents were 17 in-service secondary school English language teachers, whose experience ranges from five to twenty years; some of them having worked in primary school and a few with young adults and adults at some point of their career. The youngest person was 26 years old and the oldest 50. Twelve (70%) out of the seventeen respondents were working full time, with the other five (30%) working part time. The group was made up by fourteen women (82%) and three men (18%). Their level of English – as established by themselves – ranged from upper-intermediate to advanced.

After the process of adapting the TPACK survey for the purposes of my research, I first contacted five English teachers who I am friends with via e-mail, to ask for their help at piloting the questionnaire. These people were not part of the final 17 respondents. Their comments on the clarity of the questions, and the times they needed to complete the questionnaire (recorded on the system), proved that it was a suitable instrument to proceed with real data gathering.

I wrote an invitation for the participants to take part in my survey (Appendix A), where I described the purpose of my research, and the degree of participation they would have by getting involved in the project. I sent this invitation to a total of forty English teachers who met the requirement of working in secondary school, and also to the Facebook group Ecuadorian English Teachers, which at the time of the request had 120 members. To make sure that only secondary school teachers who are part of this group took the questionnaire, I posted this invitation with a clarifying heading. In the coming section I will
discuss some of the issues which arose during data gathering via the questionnaire.

3.2.2. Questionnaire response rate

As I stated in Section 3.2.1, the process of collecting data using an online questionnaire should have been easier than I expected. Surprisingly, this task became an issue at a certain point. The rate of participation and response to the questionnaire was affected by at least one aspect; apparently a lengthy questionnaire. One of the people who were invited to take the questionnaire pointed this out, indicating that among the group of teachers she works with, and who had also received the invitation; at least two of them opened the link, looked at it and said that it was too long.

Furthermore, the system I used for the distribution of the tool allowed me to keep a record of the number of times the link to the questionnaire was opened; 74 in this case. Assuming that those 74 times the link was opened by an equal number of teachers of English in secondary school, and considering the 17 actual responses, the rate of participation would be 23%. In this respect, Wright (2005) explains that when sending invitations to take questionnaires online “problems such as multiple email addresses for the same person, multiple responses from participants, and invalid/inactive email addresses make random sampling online a problematic method in many circumstances”. As I decided to make this invitation public on a Facebook group, another aspect which might have caused a problem is the number of members of this group who could have just opened the link out of curiosity. In the cyberspace, these people are known as ‘lurkers’ (ibid.)
3.3. Interviews

Interviews constitute one of the most valuable research techniques in qualitative studies (Walker, 1985; Berry, 1999; Polkinghorne, 2005; Thomas, 2009). As established by Schultze and Avital (2011:1)

…interviewing distinguishes itself from other research approaches by engaging participants directly in a conversation with the researcher in order to generate deeply contextual, nuanced and authentic accounts of participants’ outer and inner worlds, that is, their experiences and how they interpret them.

The above assertion is conducive to thinking that interviews offer rich data to the researcher, especially when exploring individuals’ beliefs and attitudes, as is the case in this project. Recognising Broom (2005), for the interview to be successful it should be well designed, and the data gathered must be carefully examined so that those authentic accounts result in valid implications of the studied phenomenon.

3.3.1. Semi-structured interviews

Semi-structured interviews are a combination of the structure to be covered in a structured interview (a stricter and up to a point, narrow way of interviewing) and an unstructured one, in which there is no predetermined format to follow (Thomas, 2009). Doing a semi-structured interview involves having an interview schedule which contains a number of issues that can appear in the form of open-ended and closed questions. The order in which these issues are dealt with will depend on the interviewee’s answers. If the person being interviewed has already touched upon a topic which appears later in the list, there is no need to raise this as a new question. A highly regarded characteristic of a semi-structured interview is that of
giving the interviewer the freedom of helping the interviewee when clarification is required, and also being able to extend a certain topic further if this helps their research (Grindsted, 2005; Thomas, 2009).

The interviews I conducted were semi-structured, aimed at keeping all gathered data in the words of the person telling me their experience (Atkinson, 1998). These interviews were done and recorded via Skype, of which I had informed the participants about in advance when sending the invitation for them to take part in the survey.

In order not to leave out any important details, I conducted the interviews in Spanish, the interviewees' L1. As Marschan-Piekkarri and Reis argue “[the] language [used in an interview] is not merely a technical problem that can be solved by ‘correct’ translation. Rather, it is a factor shaping [the] research process in both subtle and noticeable ways" (2004:226). It was my intention to create a feeling of certainty in the interviewees. In this way their answers would not be constrained by an unnecessary tension produced in them by having to provide rather long answers in English. The interviews lasted from twenty-five to forty minutes, and offered me an ample repertoire of data for analysis, which will be described in section 4.3.

One of the aspects taken into account, especially by novel researchers, is the importance of not underestimating the preparation that a semi-structured interview demands. The semi-structured nature of this type of interview is not to be taken lightly. As Wengraf (2001:5) claims:

Semi-structured interviews are designed to have a number of interviewer questions prepared in advance but such prepared questions are designed to be sufficiently open that the subsequent questions of the interviewer
cannot be planned in advance but must be improvised in a careful and theorised way.

Thus, the researcher looking forward to using semi-structured interviews as their research technique should anticipate what other questions may arise during the interview. Furthermore, they have to bear in mind that those new questions will have to be strictly related to the initial schedule so that both the interviewee and interviewer maintain an adequate flow of information during the exchange.

The data gathered by means of using the questionnaire guided me to think about the topics which I should include in the interview. Besides, a semi-structured interview represented to me a mode of data collection which would let me confirm my initial ideas (generated in the initial probing stage of the questionnaire), modify or discard them when analysing the more complete answers I was offered during this process.
4. Analysis of data

4.1. Analytical approach used for questionnaire data

The questionnaire I applied in the first stage of data gathering contained 31 Likert-type items, which at the same time were grouped into seven categories, resulting into seven Likert scales. Gliem and Gliem (2003:82) say of Likert-type scales:

Oftentimes information gathered in the social sciences, marketing, medicine, and business, relative to attitudes, emotions, opinions, personalities, and descriptions of people’s environment involves the use of Likert-type scales. As individuals attempt to quantify constructs which are not directly measurable they oftentimes use multiple-item scales and summated ratings to quantify the construct(s) of interest.

In this study, questions 1 – 7 of the questionnaire represent one Likert-type item each, and these seven items, one Likert scale. For analysis purposes I will refer to the scales as categories from now on. For each category, the items were grouped as shown in Table 2.

Table 2. Distribution of questions per category

<table>
<thead>
<tr>
<th>Category</th>
<th>Question Order</th>
<th>Number of items per category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Knowledge (TK)</td>
<td>1 – 7</td>
<td>7</td>
</tr>
<tr>
<td>Content Knowledge (CT)</td>
<td>8 – 11</td>
<td>4</td>
</tr>
<tr>
<td>Pedagogical Knowledge (PK)</td>
<td>12 – 18</td>
<td>7</td>
</tr>
<tr>
<td>Pedagogical Content Knowledge (PCK)</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Technological Content Knowledge (TCK)</td>
<td>20 – 21</td>
<td>2</td>
</tr>
<tr>
<td>Technological Pedagogical Knowledge (TPK)</td>
<td>22 – 30</td>
<td>9</td>
</tr>
<tr>
<td>Technology Pedagogy and Content Knowledge (TPACK)</td>
<td>31</td>
<td>1</td>
</tr>
</tbody>
</table>
The approach which I applied to analyse the two single-item categories and the other five multi-item categories differs from what Gliem and Gliem (ibid.) and other authors (Komorita, 1963; Gardner et al., 1998; Allen and Seaman, 2007; Boone and Boone, 2012) suggest as a more adequate procedure for Likert scale analysis, i.e. calculation of parametric statistics, including error coefficients.

Included in the meta-data generated by the software I used to build my questionnaire, there were the number of respondents per option in the scale, and the corresponding percentages (Tables 3 - 9). Because my sample was not as numerous (seventeen respondents only), I decided to collapse the values for the two agreement responses, and proceeded in the same way for the two disagreement options.

In the case of the categories containing a single item (PCK and TPACK) the analysis of the percentages seemed less complex, given that there was not a need to calculate these values as an average of a set of figures. Nonetheless, these two categories have to be analysed more carefully, since they represent the two broader constructs of TPACK. In the multi-item categories, some of the response percentages per item provided interesting evidence, deserving more in detail discussion as well. This initial analysis guided me on what topics I should pay attention to in the second stage of data generation; the interviews.
Table 3: Technology Knowledge Metadata

<table>
<thead>
<tr>
<th>Question</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>NR</td>
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<tr>
<td>Average (%)</td>
<td>0.00</td>
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<td>12.61</td>
<td>57.98</td>
<td>21.01</td>
<td>8.40</td>
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</tbody>
</table>

NR: Number of respondents, SD: Strongly disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree
Table 4: Content Knowledge Metadata

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<th>N</th>
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Table 5: Pedagogical Knowledge Metadata

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<td>Average (%)</td>
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<td>23.53</td>
<td>56.30</td>
<td>15.13</td>
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### Table 9: Technological Pedagogical and Content Knowledge Metadata

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<td>8</td>
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</table>
As Clason and Dormody (1994:34) claim, “It is not a question of right and wrong ways to analyse data from Likert-type items… Some techniques answer meaningful questions completely, others ignore aspects of the problem”. I hope that the following analysis provides an as complete and meaningful coverage for answering my RQs as possible.

4.2. Findings

This section focuses on the analysis of the responses to the questionnaire, in the form of percentage values. At the end of this part I will discuss the link between the findings presented below and the answers to the open-ended item of the questionnaire. I will establish how these data allowed me to proceed with further investigation in the interview stage of the research.

a. The items in the Technology Knowledge (TK) category enquired respondents about their knowledge of operating systems and computer hardware, their ability to use standard sets of software tools such as word processors, spreadsheets, browsers, and e-mail. Also, about their level of confidence when installing and removing peripheral devices, software programs, and creating and archiving documents. The overall percentage of agreement in this category was 78.99%, which means that a majority of respondents feel they possess a very good knowledge of technology. Hence, this perceived level of knowledge could help them to; for example, solve technology-related situations in their practice without having to depend on an IT technician. Although these responses are generally positive, there are some areas of note that might benefit from further probing. In response to statement 1 referring to knowing how to solve technical problems, there is still a number of teachers who replied by choosing the option
‘Neutral’ in the scale (23.53%). This suggests that this may be an area for further investigation through interview.

b. According to TPACK, in the Content Knowledge category (CT) teachers are expected to possess knowledge about the actual subject matter that is to be learned or taught, including knowledge of central facts, concepts, theories, and procedures within a given field; knowledge of explanatory frameworks that organize and connect ideas; and knowledge of the rules of evidence and proof. In average, 86.76% of the respondents agreed with the items in this category, with the statements “I have sufficient knowledge about the structural aspects of English” (Q8) and “I can use a way of thinking that allows me to analyse language in depth” (Q10) having individual scores of 64.71%. These data show that this group of teachers in general feel confident about their knowledge of and about English, and also about the aspects which make English different from other subjects to be learned and taught. On the other hand, 17.65% of neutral answers may suggest that among the seventeen people there are a few who have doubts about their knowledge of the language, and how it works as a system. This could be an issue to explore further in the interview.

c. The seven items in the Pedagogical Knowledge (PK) category asked respondents about their knowledge of processes and practices or methods of teaching and learning and the way it includes, aspects such as overall educational purposes, values, and aims. This type of knowledge, more generic, is present in all issues of student learning, classroom management, lesson plan development and implementation. Additionally, knowledge about techniques or methods to be used in the classroom; the nature of the target audience; and strategies for evaluating student understanding. The individual item with the highest
percentage of respondents agreeing (76.47%) with it was “I can adapt my teaching based-upon what students currently understand or do not understand” (Q13). The average percentage of agreement with the items in this category was 80.67%. This shows that generally the respondents feel confident about the methodologies they apply in their practice, and the way they do it, paying attention to the needs of their students. Surprisingly, 29.41% of the respondents were neutral about the statement “I can use a wide range of teaching approaches in a classroom setting” (Q16). This, on the other hand, may be an indication that they need opportunities for developing their knowledge on new approaches for language teaching.

d. For the category Pedagogical Content Knowledge (PCK), respondents had to express how much they agreed or disagreed with the statement “I can select effective teaching approaches to guide student thinking and learning in the target language” (Q19). As I mentioned earlier, even though this is a single-item category, it is broader in essence, since it comprises the concepts inherent to pedagogy knowledge and content knowledge. This type of knowledge goes beyond a simple consideration of content and pedagogy in isolation from one another. PCK represents the blending of content and pedagogy into an understanding of how particular aspects of subject matter are organized, adapted, and represented for instruction. In this case, 64.71% of the respondents agreed with the statement, which is essentially reciprocal with the values presented for the categories CK and PK. This means that for this group of English teachers their ‘inner association’ of knowledge of pedagogy and subject matter, i.e. English, seems to be balanced. However, and also in line with the percentages of neutral responses presented for the two independent categories, 35.29% chose the neutral answer for
this question. This may mean that a number of these teachers feel that they could improve their knowledge of methodological approaches for their teaching and about the language they are teaching. These areas deserve additional probing in the interview.

e. The following category, Technological Content Knowledge (TCK), is about the manner in which technology and content are reciprocally related. Although technology constrains the kinds of representation possible, newer technologies often afford newer and more varied representation and greater flexibility in navigating across these representations. There were two items; “I know about technologies that I can use for understanding English better” (Q20) and “I am familiar with technologies that I can use to help my students understand English better” (Q21). 64.71% of the respondents agreed with these two statements, while 29.41% opted for the neutral response. On one hand, these percentages show that these teachers may know about technologies which could be applied in English teaching. This knowledge seems to allow them to generate new ways of understanding the language. Furthermore, this understanding could be transferred onto their students. On the other hand, there are a few teachers in the group who may think that their knowledge of technology for understanding English better could be enhanced.

f. The Technological Pedagogical Knowledge (TPK) category was the one with the most items, nine in total. This is knowledge about the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies. 71.43% was the average percentage of agreement with the statements in the category. The individual percentage of respondents
agreeing with the statement “I usually think about how technology could influence the teaching approaches I use in my classroom” was 70.59%. This particular percentage could reflect a will for teachers to get involved in a process that helps them to increase their knowledge of appropriate technologies for the teaching of English. This inference is supported by the average 23% of neutral responses, which shows that a degree of confidence in relation to the use of technologies for English language teaching is not completely developed in part of the respondents.

g. Technological Pedagogical and Content Knowledge (TPACK), the final and more comprehensive category, is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students’ prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones.

The single item for this category was “I can teach lessons that appropriately combine English, technologies and teaching approaches” (Q31). While 64.71% of respondents agreed with this item, 29.41% chose the answer ‘Neutral’. In general terms, and as it has been expressed in the analysis of the previous categories, these final figures are indication that pedagogical, content and technology knowledge, in their individual forms and in their possible combinations apparently exist in this group of teachers. However, the level of development of such knowledge, in accordance with the TPACK framework, seems
to be constrained. An average 86.76% (highest average percentage among categories) of agreement with the statements in the CK category suggest that the teachers in this sample are knowledgeable with the English language, its structural pattern, and the ways in which it should be taught and learned. The areas of knowledge which for them seem to be more troublesome are technology and pedagogy.

The open-ended question of the questionnaire (Q32) contained answers related to the above findings. As I had established in the methodology chapter, the answers to the questionnaire would serve as initial probers into teachers’ beliefs. They guided me on what topics I should include in the semi-structured interview. Bearing this in mind, the following section presents the second stage of data analysis and further findings.

4.3. Analytical approach used for interview data

4.3.1. Selection of interviewees

In order to examine this group of teachers’ beliefs more deeply, and to generate a better understanding of their perceived knowledge of technology, pedagogy, and content, I decided to apply a semi-structured interview. The initial probing in the first phase of research informed me on what areas could be included in the questionnaire for this interview (Appendix C). The answers to the open-ended question of the first research tool helped me to decide who to interview. I choose three of the seventeen respondents based on the content of their answers. I wanted to establish a connection to my initial findings so that I could expand and confirm, or challenge them.
The following quotes present the answers of those three people – where the names I am providing have been changed. After each answer I explain the reasons for selecting them.

**Question (Q32):** Describe a specific episode where you tried combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content you taught, what technology you used, and what teaching approach(es) you implemented. If you have not had the opportunity to do so, please indicate the reasons why it has not been possible

**Linda:** “I’ve tried to combine content, technologies to teach English, but there is a big problem in the school where I work, it is the limit access to technology”

I decided to interview Linda based on the fact that her answer expresses her interest in using technology in her lessons, but she mentions a constraint when trying to do so, in this case limited access to technology. It would be interesting to know if this is the only limitation she faces, or if there are any other issues affecting her willingness to use technology as part of her lessons.

**Veronica:** “I have never used or tried to use a technology help in my classes. I’ve never been pushed to or felt I need it... I have always used the conventional way to teach English using a board, markers, and perhaps sheets of paper!!??”

In Veronica’s case, her answer is really interesting since she stresses the fact that she has not felt *pushed* to using technology as part of her teaching. The term *pushed* makes me think that, for her, use of technology may be directly influenced by other people – for example, a superior in
school – and not solely on her decision. This may also reflect a lack of interest in teaching technologies on her part.

**Alberto:** “Two weeks ago, I prepared a reading lesson to which I used computer and projector and also multimedia. First, I presented some pictures related to the story. Then, my students listened to the story without the book. The lesson aim was to read and apply simple past so that they could work in a sequence of events chart and also a letter about one of their most memorable experiences”

Alberto’s answer offered me an example of technology use as part of his lesson. His answer also relates to the way he worked during this lesson and organised it, presenting some data on his pedagogical knowledge. Knowing and understanding the factors that lead him to plan his classes in such way would be very constructive, and would add more insight to my initial findings.

### 4.3.2. Analysis

As the interviews took place, I tried to pay attention to any information that could be connected to the initial findings generated in the analysis of the data from the questionnaire. After the interviews were done, I transcribed them, and started a process of qualitative analysis of content (Zhang and Wildemuth, 2009). This involved reading and rereading the transcriptions a number of times, looking for any relevant information which could be related to my three general themes (Elo and Kyngäs, 2007; Green et al., 2007; Zhang and Wildemuth, 2009), i.e. technology, pedagogy, and content. The information I was looking for could be words, phrases, full sentences, paragraphs or any piece of meaningful information.
which I could classify and include in each of the three big themes.

The fact that I adopted TPACK as my framework, already offered me a number of categories, which I could use for subsequent analysis of the information contained in the three broad themes. This deductive-like process was based on the premise that the theory shaping the constructs of TPACK has already been proposed and I was not challenging the model, but using its theoretical groundings to find an answer to my RQs. (Elo and Kyngäs, ibid.; Zhang and Wildemuth, ibid.) As I examined the data more closely, I started to discover interesting connections to the concepts of the TPACK constructs.

To start with, I asked the interviewees about their final answer in the questionnaire. I wanted to enquire into the reasons behind those answers and discover what other aspects had an influence on them to answer the way they did.

Linda pointed out that because she works in a school located in a rural area, the provision of technology and access to an Internet connection becomes very difficult. In her answer she claims that “even though the government has started to make some changes, it is happening quite slowly… My colleagues and I sometimes take our own laptops to use them in our lessons”. In this case, for example, I classified this part of her answer into the technology category, but also in the area of pedagogy, as it shows how she could be thinking of methodologies which integrate technology as part of her practice.

In Veronica’s case, she explained that in the schools she has worked for she has been given a lesson plan containing the
topics and activities to be covered during the lesson. She explained that “mostly, the technology I have used has been the audio CD which comes with the course book, and that we reproduce in a portable stereo”. As in the previous case, this answer falls in the technology category, and also in the area of pedagogy, due to the fact that she mentions lesson planning and use of resources available.

Alberto’s explanation for his initial answer was quite developed, and had mostly ideas related to pedagogy and content. The following is an extract of his answer in Spanish, and its translation into English

“Los chicos me han dicho; Diego, te entendemos más a ti que cuando lo hacemos del tape… He escuchado incluso de algunos compañeros que cuando lo hacemos [leemos] es más lento… Nuestra forma de leer como maestros tiene un ritmo suave. No vamos tan rápido. Eso ayuda a que ellos entiendan, pero qué mejor si escuchan la pronunciación de un [hablante] nativo”.

“The kids have told me; Diego, we understand you better than the recording… I have even heard from some of my colleagues that when we read, we do it more slowly… As teachers, our way of reading has got a softer rhythm. We do not go that quickly. That helps them to understand, but it is better if they listen to the pronunciation of a native [speaker]” (my translation).

This quote reflects some of Alberto’s beliefs on the pedagogy of language teaching, and the way he is aware of aspects about the language he teaches, when talking about the different ways language can be modeled for students to understand it better.
As the interviews advanced, there were also coincidences in some of the answers of the three interviewees. When I asked them about their familiarity with any technologies which they believe they could use to improve their teaching, and also help their students learn English better, it was quite interesting to know that even though they have not used a virtual learning environment (VLE) they have an idea of how one could be part of their teaching. These are the extracts from each of their answers

**Linda:** “Quisiera saber más sobre lo que es Moodle… He escuchado que en enseñanza en general puede ser muy útil, pero me gustaría saber que se puede lograr con ese sistema en enseñanza del idioma inglés”

“I would like to know more about Moodle… I have heard that in general, for teaching, it can be really useful but I would like to know what one could achieve with that system in English language teaching” (my translation)

**Verónica:** “En una ocasión asistí a un curso de docencia y una de las materias era plataformas virtuales… las vimos muy rápido, y habría sido bueno dedicarles más tiempo y aprender a usarlas mejor”

“On one occasion I attended a teaching course and one of the subjects was virtual learning environments… we looked at them too quickly, and it would have been good to dedicate more time to them and learn to use them better” (my translation)

**Alberto:** “Yo lo que en realidad quisiera manejar un poco más son plataformas virtuales, porque en verdad hay menos falsedad en eso. Tú puedes asignar algo a través de la plataforma y los chicos deben ingresar… si no lo hacen, no van a poder completar la actividad”

“What I would really like to use more is virtual learning environments because there is less cheating in that. You can
assign something through the platform and the kids must sign in… if they do not, they will not be able to complete the activity” (my translation)

The above extracts offered me an interesting view about these three teachers’ sense of possible uses of technology in their lessons. By mentioning their intention of understanding what a VLE is, and how it could be used for English language teaching, one could infer a combination of technology, pedagogy, and content knowledge that may well be an adequate basis for reaching a developed TPACK.

Another important element to consider, mentioned by the three interviewees, was that of collaborative work. They believe this type of work could be created through the implementation of “a system in the classroom or in a laboratory” which could promote work among all the students in a group, and at the same time. This shared view of the possible benefits of a comprehensive technological aid (for example, a wiki accessed in a computer cluster, working synchronously for the practice of reading and writing) adds to these teachers’ perceived knowledge of pedagogy, technology, and content.

4.4. Further findings

The more complex constructs of TPACK (i.e. PCK, TPK, TCK, and TPACK itself) are generated by the overlapping arrangement of technology, content, and pedagogy as three different and unique types of knowledge a teacher should possess for better teaching when technology is adopted as part of their practice. Because of this, it is difficult to strictly claim that, for example, an idea in which mention is made of technology belongs exclusively to the concept of TPK, and not TCK. The following findings are presented bearing this in mind.
a. These teachers share a perceived understanding of how technology could help them to improve the way they teach.

b. They believe that keeping up-to-date with teaching technologies that enhance their teaching practice is an important aspect of their professional development.

c. They also believe that any improvement in their teaching has a direct benefit in their students’ learning.

d. They demonstrate a very positive attitude toward the use of online resources as part of their lessons, but they also deem necessary the selection of the right activities so that technology becomes a successful teaching aid.

e. They agree that technology is not to be the focus of attention of a lesson. This shows how their knowledge of pedagogy allows them to see the benefits of technology, but without devoting their complete attention to it.

f. These teachers believe that collaborative work is one of the most important assets that emerge from the efficient use of technology with teaching and learning purposes.

g. They perceive resources, such as the Internet, as a medium for the improvement of their knowledge of English, and that of their students’.
5. Research implications

The following sections will discuss the implications of this study. First of all, a summary of findings which helps to answer the research questions is presented. Section 5.2 introduces a set of contextualised recommendations for in-service course design based on the findings. Considerations for further research and a final conclusion are also put forward.

5.1. Summary of findings

The English teachers who participated in this project believe that their knowledge of technology should mainly comprise awareness of up-to-date technological aids which can be used for the teaching of languages, such as virtual learning environments combined with multimedia resources. Furthermore, they understand that for these resources to be successfully adopted and adapted in their teaching practice, they must be aware of their efficient use and implementation.

Even though it has not been possible to assess this group of teachers’ TPACK to the point of establishing a precise measure of such knowledge, evidence suggests that they hold a good level of knowledge of technology and pedagogy. Their degree of perception of content knowledge seems not clearly identified, which is why they would benefit if the TPACK framework were introduced and explained to them. By doing so, they could start a process of reflection about the areas in which they could improve, and the ways in which they could do it.

Finally, these teachers believe that the use of technology in their teaching practice could enhance it, provided that they are offered adequate guidance on how to do so.
5.2. Recommendations for in-service course design

The following recommendations result from the findings presented in the previous chapter, more precisely from the data gathered in the semi-structured interviews. I hope that these recommendations help, especially teacher educators, in the design of courses for in-service teachers taking into account their needs and beliefs about the use and implementation of technology in their lessons.

a. A technology programme for teacher education should have as its aim preparing teachers for the use of technology in the classroom so that they are able to create lessons that encourage students’ critical thinking, and use of computers as tools which help them to improve their learning. (Lowther et al. 2008).

b. Generational gaps are an aspect which should not be taken lightly when thinking of teachers as learners (Thoms, 2001; Scanlon, 2009), more when technology is the focus of attention of their preparation. It is not a matter of thinking of them as digital immigrants “who have encountered technologies later in life” (Waycott et al., 2009:1202), but more an issue of finding appropriate ways to help them to interpret technology as another element of their everyday practice.

c. Teacher educators should not take for granted that because in-service teachers are expected to keep up-to-date with current educational aids, they engage in their use. Even younger teachers “the digital natives, may not be as technology savvy as expected” (Lei, 2009:88), which is why a course layout should first cover any essential concepts related to ‘new subject’ and gradually progress to the more complex constructs being studied.
d. Any programme designed for teacher development should make strong and coherent connections of the theoretical considerations behind its implementation to what would actually happen in the teachers’ practice. (Tatto, 1998). A programme which is solely based on theory and fails to address the interaction processes in today’s traditional and online classrooms will not generate expected results, due to the divorce of theory and practice.

e. When participating in a development programme, teachers should engage in a process where they are able to experience the instructional strategies which they are expected to implement (Borko, Jacobs and Koellner, 2010). In this way they will understand what they should, how they should do it, and last but not least, understand if they will be able to apply what they are experiencing in their teaching contexts.

5.3. Considerations for future research

As Mishra and Koehler establish, “developing theory for educational technology is difficult because it requires a detailed understanding of complex relationships that are contextually bound” (2006:1018). Bearing this in mind, trying to determine the TPACK of pre-service and in-service teachers presents the challenge of understanding the constructs of this framework beyond a conceptual level. To gain a more accurate perspective on the level of technology knowledge that Ecuadorian teachers in secondary school perceive as necessary to ELT it would be appropriate to design a study with a greater number of participants, and over a more adequate period of time. The assessment of initial and final levels of TPACK during that time could lead researchers to establish suitable ways for this type of knowledge to be achieved among English language teachers in Ecuador.
An area of concern during this research process was achieving a sufficient number of respondents for the initial questionnaire. A study aimed at discovering the reasons for the lack of interest in taking part in studies like this, in Ecuadorian educational settings, may be another interesting phenomenon to be studied.

5.4. Conclusion

Ecuadorian in-service English language teachers would greatly benefit if the initiatives of change in education, proposed by the Ecuadorian government, paid closer attention to their beliefs about the adoption of technology as part of their practice. This would enable a more contextualised, less top-down implementation of development programmes. TPACK represents a valuable framework that could be adopted to aid in the process of implementing such initiatives.
References


Thoms, K. J. (2001). They're Not Just Big Kids: Motivating Adult Learners.


Applications of social research methods to questions in information and library science, 308-319.
Appendices

Appendix A: Invitation

Dear fellow English teacher,

My name is Stalyn Ávila. The reason for this e-mail is to inquire whether you would be interested in taking part in a research project I am undertaking. I am a postgraduate student at the University of Manchester (England) studying an MA in Educational Technology & TESOL (Teaching English to Speakers of Other Languages). I am in the process of researching my dissertation on the fields of teaching technologies and teacher development.

This dissertation is aimed at proposing a set of recommendations which could help to facilitate the improvement of English teaching in secondary school in Ecuador, taking into account the efficient use of technology and the approaches which could best be adopted and adapted for this purpose.

I am interested in trying to understand how your teaching practice is (or could be) transformed by the use of technology, and the approaches you think best serve (or would serve) such a purpose. Participation would involve taking an online survey and, if necessary, answering some follow up questions. During the first stage, the exchange would be over e-mail correspondence; therefore your involvement would be at your own time and pace. If I selected you to be an interviewee for the second stage, I would contact you in advance to verify your desire to further participate, and decide on the best time and date for you to take part on an online interview, most likely via Skype.

As this is an academic study, the information you share may be used in publication. Please note that your answers will be treated with the utmost respect and your identity, as well as that of any individuals and institutions mentioned, will remain confidential.
If you are interested in taking part in this study please follow the link to the survey and complete it by the 15th July, 2013. If you have any questions please feel free to contact me.

Sincerely,

Stalyn Ávila Herrera
Appendix B: Questionnaire

Understanding the role of technology in our teaching

Thank you for taking time to complete this questionnaire. It is destined to gain a better understanding on how resourceful you think technology is (or could be) in your teaching context, and how much of a role it plays (or could play) as a component of your lessons. Your answers will guide the researcher to propose an outline for the improvement of English teaching in secondary school in Ecuador.

There are no right or wrong answers, which is why you are encouraged to provide them in an honest, straightforward manner. Your responses are much appreciated.

Defining Technology

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc. Please answer all of the questions and if you are uncertain about your response you may always select "Neutral".

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<th>Neutral</th>
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<th>Strongly Agree</th>
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<td>2. I can learn technology easily</td>
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<td>3. I keep up with important new technologies</td>
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4. I frequently play around with technology
5. I know about a lot of different technologies
6. I feel confident when exploring new technologies
7. I have the technical skills I need to use technology

**CK (Content Knowledge)**

8. I have sufficient knowledge about the structural aspect(s) of English
9. I have sufficient knowledge about the communicative aspect(s) of English
10. I can use a way of thinking that allows me to analyse language in depth
11. I have various ways and strategies of developing my understanding of the English language

**PK (Pedagogical Knowledge)**

12. I know how to assess student performance in a classroom.
13. I can adapt my teaching based-upon what students currently understand or do not understand.
14. I can adapt my teaching style to different learners.
15. I can assess student learning in multiple ways.
16. I can use a wide range of teaching approaches in a classroom setting.
17. I am familiar with common student understandings and misconceptions.
18. I know how to organize and maintain classroom management.

**PCK (Pedagogical Content Knowledge)**

19. I can select effective teaching approaches to guide student thinking and learning in the target language

**TCK (Technological Content Knowledge)**

20. I know about technologies that I can use for understanding English better
21. I am familiar with technologies that I can use to help my students understand English better
32. Describe a specific episode where you tried combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content you taught, what technology you used, and what teaching approach(es) you implemented. If you have not had the opportunity to do so, please indicate the reasons why it has not been possible.
Appendix C: Interview Questionnaire

The following questions, written in English, will be translated into Spanish, interviewees’ L1. Because of the semi-structured character of the interview, the researcher will make any necessary changes/additions to the interview as it takes place.

1. As an answer to the open-ended question in the survey you said… Why did you say so? Could you please offer me some more details on the reasons for your answer?
2. Which technologies/technological resources/applications for language teaching are you familiar with?
3. Which technological resources that could help you improve your lessons are available in the institution where you work?
4. How have you used those resources? With what aim?
5. What aspects of the use of technology in your lessons would you like to know about/improve?
6. If you could choose what to know about technology in education, what would it be? Why?
7. Do you think that using technology in your lessons could improve your own teaching practice?
8. Do you think that using technology in your lessons could help your students improve their learning of English?
9. Which are (could be) the inconveniences with using technology in your lessons?
10. Have your students demonstrated any interest or motivation towards the use of technology in your lessons?
11. What are your motivations behind the use of technology in your lessons?
12. Have you attended any training sessions on the use of technology in education (recently)?
13. Did your perceptions on the use of technology in your lessons change after that training?
14. What do you think is required for (language) teachers to become more interested in making technology part of their lessons?

15. Do you feel any kind of pressure in terms of having to use technology as part of your lessons?

16. What do you think a training programme on teaching technology should include?

17. Would you be willing to participate in a long term training process on the use of technologies?