Integration of ICT to support critical reading in Bogotá

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Abstract

This study investigates how secondary school teachers in Bogotá DC, the capital of Colombia, integrate information and communication technology (ICT) tools towards achieving critical reading in Spanish language. The research adopts the technological pedagogical content knowledge (TPACK) framework as a conceptual framework. TPACK has been extensively used in English-speaking countries to research how teachers use ICT in a range of subjects. The framework allows researchers to collect and analyse a substantial amount of meaningful data to generate insights on successful integration of technology, pedagogy, and content knowledge. The methodology of the study is qualitative design with a case bounded by a convenience sample consisting of nine Spanish literacy teachers in secondary education level in Bogotá. Two data collection methods were adopted: first, semi-structured interviews with teachers, and second, document analysis of ICT for education policy and practices. Since the dataset was in Spanish language, it was transcribed, translated, coded, and analysed using thematic analysis supported by the computer-assisted qualitative data analysis software NVivo Windows Release 1. The themes within the seven TPACK factors and their relationship with each other provide deeper understanding of ICT integration by Spanish language teachers in Bogotá.

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List of Abbreviations

BYOD	bring your own device
CALL	computer-assisted language learning
CAQDAS	computer-assisted qualitative data analysis software
CK	content knowledge
CPE	Computers to Educate program
DGBL	digital game-based learning
EFL	English as foreign language
GBL	game-based learning
IB	International Baccalaureate
ICFES	Instituto Colombiano para el Fomento de la Educación Superior (Colombian Institute for the Promotion of Higher Education)
ICT	information and communication technologies
LAD	language acquisition device
LSP	Literacy Strengthening Plan 2017–2020
MDG	Millennium Development Goals
MINTIC	Ministry of Information and Communication Technologies
MOE	Ministry of Education
PCK	pedagogical content knowledge
PIS	Participant Information Sheet
PISA	Programme for International Student Assessment
PK	pedagogical knowledge
PNDE	National Education Ten-Year Plan 2016–2026
PNTIC	National Plan for Communication and Information Technologies 2008–2019
QUT	Queensland University of Technology
SAMR	substitution, augmentation, modification, redefinition
SDGs	Sustainable Development Goals
TCK	technological content knowledge
TK	technological knowledge
TPACK	technological pedagogical content knowledge
TPK	technological pedagogical knowledge
UN	United Nations
XK	contextual knowledge
ZPD	zone of proximal development

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Chapter 1: Introduction

1.1 Overview of the Problem

Among the 17 Sustainable Development Goals (SDGs) established by the United Nations (UN) (United Nations, 2015), Goal 4, quality education, is expected to ensure that all students will have equitable and quality primary and secondary education, leading to relevant and effective learning outcomes. The goal seeks to increase the number of youth and adults who have access to relevant information and communications technology (ICT) skills, among other tasks, by the year 2030 (UN, 2015). An international agency of the relevance and reach of the UN working to achieve education illustrates the importance of investing in it, as a better educated labour force has a positive and significant impact on economic growth (Afzal et al., 2012; Loening et al., 2010). Part of the education SDG is language literacy, noted as one of the cornerstones of national development and individual growth, for literacy is understood as a driver for sustainable growth, reducing poverty and enabling better participation in the labour market (UNESCO, 2015). Similarly, providing high-quality and continuous education is one of the prevalent ideals behind most national states and international agencies (Bulman & Fairlie, 2016).

At the same time, the ubiquity and capacities of ICT in today's world allow for a better and faster propagation of education; therefore, international agencies and national governments find that promoting the integration of education and ICT is significant nowadays. Nevertheless, different contexts have different challenges for the integration of new tools into a traditional environment like education. Consequently, different strategies need to be tested in matching the new technologies with the old pedagogy or reformed pedagogies.

Developing countries suffer significant hardships, including poverty, low education levels, insufficient access to family planning services, poor infrastructure, and governmental corruption. International agencies and national governments aim to improve these realities, and one of the best tools to accomplish this goal is education: Investment in good-quality education has direct positive consequences in raising national income by increasing the marginal productivity of the workforce (Breton,

2013) while affecting economic growth positively and significantly in the long run (Afzal et al., 2012).

Within education, literacy takes a special place (Jacy et al., 2008) since reading and writing are essential requisites for all communicative transactions to acquire knowledge and learn new occupational practices. Thus, reading forms the basis for future educational achievements (Karami et al., 2013) that empower individuals and improve their capacities to better engage in society (UNESCO, 2015). The inclusive term *literacy* is commonly defined as the ability to read and write, but there is more complexity: Reading and writing abilities differ between different cultures and contexts, and these too are constantly shifting. The changing nature of humanity, its culture and contexts make it difficult to understand just one literacy. Therefore, beyond basic literacy abilities lies critical literacy or *critical reading*, passing beyond the basic understanding of the written words and their meaning. Achieving critical reading denotes not only reading words, but understanding that the written word is culturally, historically, and politically contextualised (Cassany, 2003; Luke & Dooley, 2011). It is this "critical" nature of the critical reading that builds up critical thinking, where basic communication abilities are tested and people build meanings drawn from the written word, becoming critical thinking citizens. The critical reader interacts with the text, relating previous and current knowledge to it. Furthermore, critical readers are capable of reflecting and discussing the content they have received, evaluating it and judging the new information with the aim of incorporating it (or not) into their own core knowledge and beliefs (Cassany, 2003; de Barón, 2016).

Against the above background, the aim of this research is to determine how Spanish literacy teachers serving secondary schools in Bogotá DC, the capital city of Colombia, are using ICT for improving the critical reading competence of secondary school students using the technological pedagogical content knowledge (TPACK) framework, a widely known theoretical framework for technology integration in education (Mishra & Koehler, 2006). This introduction chapter outlines the literature review of this research in four areas: (a) the current state of pedagogical theories on literacy (Section 1.2); (b) the importance of critical literacy and how to teach it in secondary school (Section 1.3); (c) the relevance of ICT, the existing approaches to its integration in education, and the documented outcomes (Section 1.4); and (d) how researchers are combining pedagogy, technology, and language learning (Section 1.5).

This leads into an explanation of the research problem and research context (Sections 1.6 and 1.7). With the context explained, the research questions will be presented (Section 1.8), followed by the methodology (Section 1.9) and the chapter structure for the remainder of the thesis (Section 1.10).

1.2 Background – Pedagogy

Separating itself from traditional teaching practices, teaching nowadays is built upon the idea that the student is the focus of the teaching endeavours. This change was provoked by social, economic, and cultural changes during the 19th and 20th centuries that were reflected in teaching as a profession and in pedagogy as an academic discipline having various theoretical concepts. Authors like Vygotsky (1962), Montessori (1988), and Piaget (1969) suggested a shift to a student-centred pedagogy, where students no longer sit passively in their seats while taking notes. These authors share a common interest in offering students experiences to construct understanding and knowledge, with teachers producing interactive instructions involving cycles of activities and feedback, giving students opportunities to apply learning in the classroom by promoting problem-solving and critical thinking in a safe learning environment, closer to the development necessary for students to become independent and critical thinkers (Secretaría de Educación del Distrito de Bogotá, 2018b). Although many different approaches to teaching coexist, some common ground is shared (Bedoya & Arango, 2012; Mattar, 2018): (a) learning should be an active process in which the student participates or interacts with the learning activities and processes, as opposed to passively taking in the information and memorising it to recite back; (b) learning is achieved in a given context, and therefore understanding the contextual influences on student learning is critical; and (c) the teacher or instructor acts as facilitator and designer of the context, where the learner is encouraged to use their own abilities to achieve learning.

1.3 Language Acquisition, Critical Reading, and Secondary School Practice

Before learning to read, people learn to talk. *Language acquisition* is the process by which human children acquire the capacity to identify, comprehend, and generate language when the children develop under normal circumstances, a process that leads to the acquisition of the children's native tongue. Yet, the process itself is understood

from three different perspectives, namely, behaviourist, nativist, and social/cognitive, which differ depending on the relevance given to different influences by certain external and internal factors (Mohamad Nor & Rashid, 2018).

Once the native tongue is acquired, children start reading, which in its more basic interpretation means they can understand and interpret any symbolical expression that can be read (Smith Avendaño de Barón & González González, 2020). But reading is more than interpreting symbols, for according to the Colombian Ministry of Education, there are three components that build the concept of reading, or rather, of *critical* reading (ICFES, 2019): (a) the semantic component, which involves the basic ability of the reader to understand the meaning of symbols – words – and phrases; (b) the syntactic component, which refers to the ability to retrieve implicit information from the text by understanding the semantic component; and (c) the pragmatic component, which is built upon the previous ones and consists of the reader constructing meaning from their knowledge of the author and context of the text. To achieve critical reading, all three components must be involved (Cassany, 2021).

Secondary school teachers face difficulties in getting their students to learn the three components and achieve critical reading in Bogotá DC. Because of this, several articles worldwide and some from the Colombian context are discussed in the literature review, for example, how teachers can help improve reading comprehension of secondary school students by employing different pedagogies and instructional strategies (Cassany, 2012; Street, 2008), and how a year-long intervention managed to improve content and critical reading comprehension of students from 8th grade using active learning (Swanson et al., 2017).

1.4 ICT, Education, and Its Integration

ICT, short for Information and Communication Technologies, lacks a universally agreed-upon definition due to its ever-evolving nature, with various authors and institutions offering different interpretations. In this thesis, however, the definition put forth by UNESCO (2021) will be adopted: "a diverse set of technological tools and resources used for the transmission, storage, creation, sharing or exchange of information." This includes hardware such as computers, smartphones, and networking equipment, as well as software applications and systems used for tasks such as data analysis, communication, and content creation.

The rise of ICT in everyday life has prompted significant changes in 21st century society, leading to more people being able to access information and appreciate the messages therein. As mentioned before, literacy is an ability mediated by the context, so recognition of this sociocultural context has eventually been reflected in educational systems and consequently in the concept of literacy and the teaching role. The school management and learning environment towards achieving optimal quality and efficiency for literacy education is also a subject to be addressed in this changing context, understanding how educational institutions do not exist in context-less scenarios but are endowed with both external contexts (community, parents, and the culture in which institutions are immersed) and internal contexts (students, staff members, teachers, directors, technicians, etc.).

The incorporation of ICT to the educational field warrants an appreciation of the wider context. Adoption of ICT in education by governments happened due to an increased awareness of the need for strategic development under the digital economy and, consequently, the need to focus resources on improving digital education to expand its benefits and respond to key social and economic challenges, such as reducing unemployment and inequality, as well as the eradication of poverty (Octavio & Párraga, 2017; OECD, 2015). Nevertheless, adapting to these changes is a challenging task for institutions and policymakers (So & Kim, 2009), for using ICT as a teaching resource entails the modification of the traditional teacher-centred teaching and learning models. This requires training future teachers to master these new technological tools and retraining in-service teachers.

It is acknowledged that teachers are the most important factors in the education of students (Timperley et al., 2008) by developing plans, innovative strategies, and teaching resources with a view to achieving a comprehensive education of each student, thus improving educational quality and achieving better results in standardised tests (Padilla-Escorcia et al., 2022). Consequently, the adoption by teachers of ICT for education is fundamental as part of the process of integrating technological innovations. To achieve teacher engagement in ICT for education there is a need to develop modules or implement training to improve their pedagogical practices based on knowing how to use digital technologies in classrooms. However, if institutions and policymakers feel challenged, teachers too feel threatened because those in policy, government, schools, and society are increasingly looking to teachers to shoulder a significant weight of

responsibility for paving the way forward (Cochran-Smith & Villegas, 2015; Logan et al., 2015). In addition, teachers are the first to feel the awkwardness and inadequateness of changing educational methods when teaching to younger, more tech-savvy generations (Brush & Saye, 2009; Kramarski & Michalsky, 2010). This leads to concern shown by educators on how to successfully integrate ICT into their teaching (Jimoyiannis, 2010; Polly et al., 2010), with preservice teachers and less experienced in-service educators using ICTs in their classroom in a limited manner due to their lack of pedagogical experience and limited knowledge about incorporating new technologies in the classroom (Devolder et al., 2010; Ertmer et al., 2012). However, the need for effective professional development and time have been consistent barriers to technology integration in classrooms (Khan et al., 2012), and as a manifestation of this problem, instead of adapting to the new technologies, some teachers may downplay the importance of ICT integration into their professional practice.

But how does the integration of these new technologies with education occur? Any appreciation of the challenges confronting all stakeholders regarding the use of ICT for education first requires an understanding of the constant advancement of digital innovation (Hicks & Graber, 2010; Oke & Fernandes, 2020). Over the years, institutions and administrators have attempted to incorporate ICT and digital literacy as demanded by politicians and the general public (William E. Bertrand, 2010). Initially, ICT development allowed access to hardware and software in educational settings to be possible. The early strategies to increase access focused on providing hardware, either by means of computer rooms in schools, which were very cost demanding, or bring-your-own-device (BYOD) strategies where students provided their hardware for educational purposes on school grounds (Ally & Tsinakos, 2014; Grant & Barbour, 2013). The second set of strategies focused more on the pedagogy rather than the access, witnessing a spread of new pedagogical practices, such as blended learning, that aim to combine digital educational materials and online interaction with proven traditional teacher-based classroom methods, whether the digital instruction is done in class or at home (Friesen, 2012). Online learning is another strategy that differs from blended strategies as it does not possess a physical face-to-face part, and it seems to be one of the fastest growing approaches today, with several benefits and some difficulties that will be addressed later (James & Poonam, 2015).

On par with the integration of technology, the way pedagogical content is delivered is also changed by technology. Digital gamed-based learning, or DGBL (Prensky, 2003), is one technology application where digital video games can have significant value in improving learning and particularly learning literacy, taking advantage of the instructional potential of video games by adapting the teaching-learning process to this tremendously successful gaming genre while enhancing the motivation to learn (Woo, 2014).

Other examples of how content delivery changed with ICT come from educators and researchers that have been experimenting with and creating new practices and teaching methods using new technologies in their classrooms. In literacy, for example, Proske et al. (2014) found that students felt more engaged to write and that by engaging with mini-games and game-based practices, students would also devote more time to writing interactive inputs in video games, which is important since practice and attention are considered crucial for learning. Roscoe et al. (2014) used the software W-Pal to improve writing performance of the student players and reported positive results in their essays, as well as that participants were more motivated to participate in classes with said software. In México, Jiménez Porta and Diez-Martínez Day (2018) analysed 20 commercial and educational video games for early reading of Spanish and found development in four cognitive processes of student players: (a) early alphabet learning by improving the recognition of letters and the correspondence between letter name and letter sound; (b) phonetic and phonologic conscience by codifying and decodifying and learning orthography; (c) the structure of language by upgrading the student's vocabulary and use of words; and (d) reading behaviours like directionality.

1.5 Convergence: Pedagogy, Content, and Technology

In light of the above discussion, it is important to consider how to bring these innovations to support ICT applications in teaching and learning into classrooms. The integration of new technologies in schools carries new challenges, so to succeed in teaching with any ICT application, teachers are constantly asked to structure their classes to better suit the students, hoping to ensure optimal learning outcomes from the early-adopter instructional procedures. To help understand and navigate through this conundrum, Mishra and Koehler (2006) designed the TPACK framework to

structure how educators may conceptualise and understand technology to ensure quality teaching in the 21st century.

TPACK delineates the knowledge areas that are essential for teachers nowadays to proficiently integrate technology into learning environments and strategies. It builds on the premise that successful technology teaching involves the combination of a teacher's disciplinary or content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK) (Schmidt et al., 2009). Three more types of knowledge result from the intersection of the three core knowledges: pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical knowledge (TPK). The last segment where all three core knowledges converge in harmony is called technological pedagogical content knowledge (TPACK), which is the result of the combination of all this knowledge, bringing together all seven components of the TPACK model (Baran et al., 2011; Denise A Schmidt et al., 2009).

This interrelation of the various knowledge segments implies a change in the teaching profession, further moving teachers away from teacher as the master of classes and bringing them closer to a role of guide or facilitator in the learning process (Gómez Trigueros, 2015) and capable of deploying educational strategies (Molas & Roselló, 2010) according to current practices. For any new model to be successful, teachers need to be equally prepared in the three knowledge areas, so the task of interrelating them is possible and the probability of improving student learning with technological tools is increased. The TPACK model was designed on the assumption that technology will keep gaining importance in education, as argued by several authors who deal with the integration of ICT in the classroom (Koehler & Mishra, 2009; Swallow & Olofson, 2017). As technology and its applications in education evolve, Mishra and Koehler (2006) state that teachers not only have to learn the use of technologies, but also acquire skills to continuously adapt to the changes that occur in the face of new software and hardware, highlighting the speed by which technology loses its relevance.

In summary, for the TPACK model to yield positive results, teachers must be adequately proficient in the three essential knowledge areas. This enables them to effectively connect these areas, ultimately raising the likelihood of enhancing students' learning outcomes through the use of ICT. The TPACK framework allows teachers to determine their level of mastery of knowledge areas (Benson & Ward, 2013); thus,

TPACK is understood as a comprehensive framework qualified for addressing struggles in the training of pre-service teachers, as well as in post-graduate courses or the retraining of in-service teachers. This model aids in fostering alterations in approaches and attitudes toward Information and Communication Technology (ICT) among teachers.

1.6 Research Problem

Against the above background, this research focuses on technology integration for critical reading in secondary schools in the context of Bogotá DC, the capital city of Colombia, where the themes relating to teaching, literacy, and technology previously discussed are present as much as in any other developing economy.

Throughout Colombia, the quality of education provided in schools is questioned by different actors, due to students consistently performing below the expected results in national and international standardised tests. For example, Colombian students' results in Programme for International Student Assessment (PISA) tests reveal that a high percentage of students are stuck at low levels in critical literacy, especially when compared to the OECD average (Secretaría de Educación del Distrito de Bogotá, 2018b). This reality exists nationwide even after Colombia's national government focused significant efforts and funds into modernising the schools and the way teachers deliver their classes, adapting new technologies and educational theories in a country divided by social and economic differences with a long history of social injustice and inequality. Although this research focuses solely on the Capital District of Bogotá, which has a high level of autonomy, the city's policies are still regulated by national laws and policies that influence the realities found in the city. Therefore, both city-level and national ICT for education initiatives will be addressed in the next section and when necessary, while acknowledging if said policy is authored by the nation or the city.

1.7 Research Site's Context: Bogotá DC

The city of Bogotá is the site of the proposed study. As the capital and largest city of Colombia with 7,412,566 inhabitants within the city's limits (DANE, 2019), it is a territorial entity of the first order administered as the Capital District, as well as the capital of the department of Cundinamarca (Colombia, 1991). The district of

Bogotá is the political, economic, administrative, cultural, and industrial centre of the country. It has achieved a high student enrolment rate of 87.3% and provides education to 1,452,675 students (Secretaría de Educación, 2018); 58.1% of them are enrolled in the 708 public schools, while the remaining 41.9% are enrolled in the 1,756 private schools (Bogotá como vamos, 2018).

1.7.1 Colombia's Education System

The Colombian educational system includes a comprehensive framework of legal regulations, curricular programs, educational institutions, social organisations, and human and financial resources, aimed at achieving educational objectives. The Ministry of Education of Colombia is responsible for coordinating and regulating this system (Colombia, 1991). The Political Constitution outlines the fundamental characteristics of the educational service: its status as a person's right, a public service with a social function, and the responsibility of the state to oversee and ensure its quality, and effectiveness, and the moral, intellectual, and physical development of students.

The Colombian school educational system contains various levels, including initial education, preschool education, primary education, and secondary education. The secondary education cycle consists of six grades from Grade 6 to Grade 11, typically starting at the age of 11 or 12, and students usually complete school around the age of 17 or 18 and earn a school degree. The primary goals at this stage include the comprehension of universal ideas and values, preparation for higher education, and workforce readiness (MEN, 2016).

As discussed earlier, Spanish language is the official language in Colombia: it is taught as a core subject in schools from the earliest grades onward, following thematic guidelines that focus on grammar, vocabulary, reading, writing, listening, and speaking skills (MEN, 2016). The specifics can vary depending on the school and curriculum, but generally, Spanish language instruction begins in kindergarten or first grade and continues throughout the entire education system.

In primary school (grades 1-5), Spanish is typically taught as a separate subject, with dedicated lessons focusing on reading, writing, grammar, vocabulary, and speaking skills. Teachers may use various methods such as textbooks, workbooks, interactive activities, and multimedia resources to engage students and reinforce learning. In secondary school (grades 6-11), the focus shifts to ore advanced topics

and literary analysis. Students continue to develop their reading, writing, listening, and speaking skills, studying contents based on Universal literature as well as authors from Colombia and other Spanish-speaking countries.

Overall, Spanish language education in Colombia aims to develop students' communication skills, cultural and contextual competence, and appreciation for the Spanish language and heritage. The approach may vary depending on the school, teacher, and student population, but the goal remains consistent: to equip students with the skills they need to effectively communicate in Spanish, based on the curricular guidelines and standards designed by the MEN, and the three components that build the concept of reading discussed in chapter 1.4, the semantic component, the syntactic component, and the pragmatic component.

The evaluation of students' competencies in the Colombian educational system is conducted through standardised tests. The Colombian Institute for the Promotion of Higher Education (ICFES) manages the state examination of secondary education using an exam named Test Saber, which comprises tests in critical reading, mathematics, social and civic sciences, natural sciences, and language (Spanish language). A minimum performance on these tests is a prerequisite for admission to higher professional, technical, and technological education. The performance levels in critical reading evaluation under the ICFES standardised test provide descriptions of an individual's skills and knowledge, complementing numerical scores (ICFES, 2021). These levels categorise students into tiers 1, 2, 3, and 4. The tiers are hierarchical, increasing in complexity, with level 4 being the most intricate and inclusive; to reach a higher level, one must have passed the lower ones.

- Level 1: The student identifies literal elements in texts without establishing meaning relationships.
- Level 2: In addition to level 1, the student identifies communicative intentions and basic relationships; the student comprehends texts in a literal way, recognising explicit information, text structure, basic semantic incidents, and local and global meanings.
- Level 3: The student's expertise expands on levels 1 and 2 by inferring implicit content, recognising structures, discursive strategies, and evaluative judgements. Also, the student hierarchises information, establishes intertextual relationships, and relates textual markers. The

student recognises literary elements, language use in context, and synthesises information.

- Level 4: The student builds upon levels 1, 2, and 3 by reflecting on the author's worldview, accounting for paratextual elements, and evaluating content, discursive strategies, and argumentative elements; the student integrates information from multiple texts, applies literary analysis concepts, and considers context. The student formulates critical stances, proposes solutions, and generates reading hypotheses based on text ideas.

These performance levels enable a comprehensive assessment of individuals' abilities, from basic comprehension to critical analysis and interpretation of complex texts, considering context, author perspective, and ethical positions. However, the quality of the education provided is less positive than expected, as exposed by the results of the ICFES Saber 9 test (one of several periodic tests designed by the Colombian Ministry of Education to assess the competencies possessed by students between eighth and ninth grade, in accordance with the national competency standards). For example, the results recorded in 2017 for ICFES Saber 9 tests in language (Spanish language) reveal that 54% of ninth grade students are located below the minimum expected level, while 17% are in the insufficient performance levels (ICFES, 2019). On the other hand, higher percentages of third and fifth grade students are in advanced and outstanding levels of performance (ICFES, 2019). These findings raise questions about the disparities between the reading abilities of students in primary school versus the abilities found in secondary school students, suggesting that once students reach secondary school, they struggle to maintain their learning curve and achieve the understanding expected at secondary level.

Bogotá's education authorities aim to have education play a central role in the economic, social, and environmental development of the city during the 2020–2024 period, under the policy plan called *A New Social and Environmental Contract for the Bogotá of the 21st Century* (Alcaldía Mayor de Bogotá, 2020). This document proposes six programs to close several disparities throughout education in coverage, quality, and the digital gap, with emphasis on providing internet connection for the 100,000 poorest households of school students in the district's education system. These plans continue the past city government's "Bogotá better for all" program, which mainly focused on developing infrastructure by means of building public schools and upgrading the

existing ones, while also attempting the implementation of ICT to improve the management of learning and environments for learning by providing access to and quality time for use of hardware (Alcaldía Mayor de Bogotá, 2018). However, it is clear that both programs primarily addressed the issue of connectivity and coverage, so the pedagogical side of ICT integration was pushed to second priority, with no program directly focused on the creation, purchase, or development of ICT resources for learning. Instead, the policies cover the direct purchase of ICT resources for teachers to manage information (Secretaría de Educación del Distrito de Bogotá, 2018a).

Additionally, the national government has launched several policies for ICT integration (not only for educational purposes) that overlap both in aims and time and that, thanks to their magnitude and scope, have direct influence on the city's policies and approaches. From these policies, the two with the broadest aims are the National Plan for Communication and Information Technologies 2008–2019 or PNTIC by its acronym in Spanish (Ministerio de Tecnología de Información y Comunicación, 2008), and the National Education Ten-Year Plan 2016–2026 or PNDE by its acronym in Spanish (MEN, 2017). The PNTIC short-term aim is to integrate ICT in society as a response to the massive and accelerated growth of ICT worldwide and in Colombia, by means of improving access to infrastructure, helping the incorporation of ICT, and consolidating the online government process, thus aligning itself with the city's policies previously discussed. The long-term purpose of PNTIC is to improve social inclusion and increase competitiveness by making efficient and productive use of ICTs, making Colombia stand in first place in Latin America in competitiveness (Arévalo Duarte et al., 2016).

The PNDE is a proposal for the education sector to become an engine that drives economic development and social transformation in Colombia from a neoliberal economic perspective, establishing the educational strategies, plans, and policies for a decade. In its fourth strategic challenge, the PNDE presents the construction of a public policy for the training of educators, following four strategies:

1. To promote alternative spaces that include teacher training among peers to share best practices and incorporate new pedagogies and didactics, tools and flexible technologies into professional practice.

2. To promote reflection on the teachers and on the meaning of their training in order to favour new experiences and ways of recognising and promoting their qualification through the educational system.
3. To guarantee that the processes or actions that are carried out for the identification, recognition and monitoring of teachers' qualifications are in accordance with the sustainable development of the country while being flexible and constantly updated.
4. To promote lifelong learning and reflection, systematisation and socialisation of the teachers' pedagogical experience towards the continuous and advanced training processes of educators.

   (MEN, 2016)

Based on these policies, new programs such as the Colombia Live Digital Plan 2010 – 2014 (Plan Vive Digital Colombia 2010 – 2014 in Spanish) have been developed. This plan was launched by the Ministry of Information and Communication Technologies (MINTIC) in 2010 to promote the mass use of the internet, multiply the number of connections to the network, and connect micro, small, and medium businesses and Colombian households (MINTIC, 2011). The PNTIC has also helped the government to renew and organise under a single framework several other programs that were created under different terms, circumstances, and governments (Sánchez Sáenz, 2012) like the Computers to Educate (CPE) program, created in 2001 with the aim of allowing each Colombian child to access world-class education and generating equity through ICT. Through CPE, the Ministry of Education (MOE) delivered 4,586,819 terminals and trained 501,142 teachers nationwide from 2010 to 2019 to support the use of ICT in teaching and learning. Another such program by the MOE is Learn Digital, established in 2019 after recognising that digital transformation implies a change in learning of students and requires the transformation of teaching by teachers and managers. To do this, educational innovation and the transformation of learning environments based on digital tools are encouraged; however, as it is a relatively recent program, it requires the support and promotion of different actions that drive the strategy and allow for greater coverage in public schools nationwide.

Likewise, programs towards the improvement of reading have also sprung from policies established before, like the Literacy Strengthening Plan 2017–2020 (LSP by its acronym in Spanish language), developed by the District's Secretary of Education

(Secretaría de Educación del Distrito de Bogotá, 2018c). The LSP had three major areas of interest. First, it aimed to guarantee and stimulate students' capacities and taste for reading and writing from early childhood and throughout life by creating programs for training and appropriation of reading and writing by youths. The LSP also documented how, as part of the stimulation of reading and writing, teachers are essential, and it therefore aimed to improve and empower the communicative competencies of managers and teachers towards their successful pedagogical practices with student-centred strategies. Second, the LSP aimed to strengthen, modernise, and articulate the public schools, and community library system in urban and rural Bogotá; and third, it aimed to generate research, knowledge, and exchange of knowledge about reading and writing practices in Bogotá. The development of the LSP created actions for Grades 1, 2, 4, and 5, serving 190 strategic schools during the 4-year period: 30 pioneer schools in 2017, 96 more schools in 2018, and another 64 in 2019.

1.7.2 Supporting Teaching and Learning with ICT in Underdeveloped Countries: The Colombian Case

Literacy is a fundamental and indispensable component for successful academic advancement. It is for this reason that the UN has supported various initiatives, including Education for All and the Millennium Development Goals (MDG) 2000–2015, since as early as 1990. Currently, the UN's SDGs aim to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" through Goal 4, quality education (UN, 2015). Education serves as a crucial tool for upward socioeconomic mobility, is a key factor for escaping impoverishment, reduces social and economic inequalities, and promotes the development of tolerant and peaceful societies. As such, it is essential to prioritise and invest in education to achieve global SDGs (UN, 2015).

Despite the UN's MDG and SDG aspirations, transformation of educational technologies is happening in a context of deep inequality understood as "the digital gap", which is recognised as an uneven distribution in access to, use of, or impact of ICTs between any number of distinct groups (Lopez-Sintas et al., 2020). For example, in the USA in 2016, 98% of children living in households with yearly earnings above US$100,000 had their own computer, while just 67% of children in households with yearly earnings under US$25,000 enjoyed similar equipment (Bulman & Fairlie, 2016).

The digital gap in Colombia is different; due to the governmental policy of providing devices, the country has a higher ratio of computers per student than countries like Denmark. Yet, only two-thirds of these are connected to the internet, even at low speeds, and users lack basic skills like sending emails with attachments (OECD, 2019b).

The differences between how the digital gap presents itself in different contexts shows how, depending on the design and implementation of policies, ICT could help ease or further harm the existing inequalities. In this regard, policymakers in underdeveloped societies face challenges of another nature, since middle-income and low-income countries are confronted with infrastructure and democracy problems that weaken innovation in educational technologies. Often the digital gap creates an environment where pedagogical solutions are copied from developed countries with societies and economies that are different from those of the recipients, forcing the programs to be aligned to fit the developing countries' needs, sometimes leading to less than satisfactory results. On top of this, the lack of scientific studies makes practical evidence scarce, further promoting the difficulties of assessing and improving the policies adopted. Nevertheless, implementation of different policies has been tried in Latin America and the Caribbean, with over 10 million laptops distributed in schools for educational purposes (Arias & Cristia, 2018) put in some of the situations reported, the educational value of the laptops was not significant (Bando et al., 2016).

The digital gap is very real and big, even after allowing access for underdeveloped countries to some technologies. Colombia is no exception to the policy changes and digital gap previously discussed, but despite having access to an abundance of local and international information on how to improve literacy, the literacy level in the country has not improved, as confirmed by PISA test results, with low scores as a consequence of declining motivation in reading and writing (OECD, 2019a). To address the above, technological innovations to support learning, mediated by innovative pedagogies using correct pedagogical strategies combined with authentic and interesting literacy content, may provide a means to strengthen literacy outcomes in Colombian schools (Schunk, 2020; Squire, 2006).

The development of the Colombian communication sector market indicates a continuous growth in recent years (OECD, 2019b), with revenues of technology companies increasing, more investments for expanding networks, and increased access paths, leading to an increase in subscriptions to fixed broadband from 8.4 to 13.4

subscribers per 100 inhabitants. Yet, the speed of this connection is still a matter of debate, as discussed by the OECD when comparing the average connection speed of Colombian networks with other Latin American OECD countries (OECD, 2019). In recent years, mobile broadband has been at the spearhead of connectivity attempts in Colombia, with subscriptions surging from 13.7 to 52.1 per 100 inhabitants. However, as with fixed broadband, the Colombian reality lags behind other OECD countries, and further investment is needed to make both networks more competitive and updated for the population.

To foster universal access to the internet and the needed infrastructure, the Colombian National Government ran the Live Digital for the People (in Spanish language: Vive Digital para la Gente) plan from 2014 to 2018 (MINTIC, 2014). As part of this plan, approximately 900 Vive Digital access points were created in Colombia's poorer areas, including rural and remote (OECD, 2019a). These access points allow public access to entertainment, training, and online government services. The result is that 10% of people use this service, as opposed to the nearly 81% who use internet from their homes or school. On behalf of education, the MOE also developed a new curriculum to encourage students to pursue tertiary level courses in ICT by allowing them to specialise in ICT-related subjects in the final 2 years of their secondary education, aiming to provide skills in programming and web design (Colombia aprende, 2018).

1.8 Research Question

The objective of this research is to use the TPACK framework to determine how Spanish literacy teachers serving schools in Bogotá are using ICT for improving critical literacy competencies of secondary school students. One key question and three sub-questions were formulated to address the above objective.

Key question:

How do Spanish literacy teachers integrate ICT to teach critical reading in private secondary school settings of Bogotá DC?

Sub-questions:

1. *What is the competency level of secondary school Spanish literacy teachers in Bogotá to integrate ICT to teach critical reading?*

2. *What is the pedagogical knowledge competency level of secondary school Spanish literacy teachers in Bogotá?*
3. *What is the subject content knowledge competency level of secondary school Spanish literacy teachers in Bogotá?*

1.9 Methodology Outline

This research is seeking an understanding of the phenomenon of *how* ICT integration in Spanish language critical reading teaching and learning is taking place in Bogotá. Given the exploratory and in-depth investigation required to understand the practices of secondary school teachers, this research adopted a qualitative approach with a case study design to delve into this phenomenon and the research questions. Two data collection procedures and protocols were used: semi-structured interviews and document analysis. The two types of data were transcribed, translated, and coded before being analysed and compared. Finally, to organise, manage, and code the data for obtained for analysis, the qualitative data analysis software NVivo was used.

1.10 Thesis Structure

The thesis consists of six chapters. This first chapter, Introduction, has presented the proposed study and why it is important and relevant. It provided an overview of the problem to be addressed, and a background review of the literature in literacy, ICT, and the integration of both. It has explained the research problem and the context of the research location where the data collection and analysis took place, the city of Bogotá. Finally, the chapter detailed the research objective and questions and presented a short outline of the proposed methodology.

Chapter 2, Literature Review, consists of five parts that support the study by informing about pedagogy, reading, and technology. First, it examines the current state of pedagogy and how teaching has evolved. Second, the chapter reviews language from theories on how it is acquired to build an understanding about reading and critical reading and how it is taught in the secondary school context that this research works with. Third, it examines technology, starting from its evolution, and how current ICT tools are being used to teach. The fourth section presents the TPACK framework, identifying its parts and how other researchers have used it to effectively integrate ICT

in their teaching practice. The fifth section discusses the substitution, augmentation, modification, and redefinition (SAMR) model, identifying its parts and uses in education.

Chapter 3, Methodology, describes the research design and methodology used to address the objectives stated in Chapter 1. The first section provides an overview of the research design, while the second section explains the research approach. The third section describes the sample and discusses how and why the participants were selected. The fourth section explains the data collection methods, which leads to the fifth section, where the data analysis is explained. The sixth section reviews the research rigour, and finally, the chapter ends with discussion of the ethical considerations of the research.

Chapter 4, Results and Analysis, reports findings from the thematic analysis of the semi-structured interviews and document analysis. It reports the outcomes based on the a priori themes selected and thus contains a different subsection for each of the knowledge areas of the TPACK framework.

Chapter 5, Discussion, delves into how the results of this research describe the interviewed participants' views and use of ICT, and their high knowledge of the best practices for teaching Spanish language critical reading skills and methods. It also discusses how the participants' abilities in integrating ICT are differentiated and how useful ICT is in enhancing teaching. The chapter discusses three different levels of ICT integration: a basic integration of ICT into classrooms that provides no direct pedagogic enhancement; an intermediate integration where teachers understand some of the available digital tools to enhance learning outcomes; and a high integration strategy that successfully integrates different ICT tools with various pedagogical strategies, and how the literature supports or contradicts these findings.

Finally, in Chapter 6, Conclusions, suggestions and implications from the study are discussed. This encompasses its contributions to advancing understanding of ICT integration in school environments, its role in presenting insights into TPACK applications within the realm of Spanish language literacy, and its contribution to comprehending practical aspects. Furthermore, the chapter addresses the study's limitations, underscores the necessity for professional development initiatives for literacy teachers, and advocates for further research in the field. Ultimately, the chapter concludes with final remarks on the study.

Chapter 2: Literature Review

As described in the context and background in Chapter 1, language literacy is one of the cornerstones of both individual and national development and growth. However, what constitutes literacy and how it may be acquired has changed over time (Castles et al., 2018), and to understand its current state, a review is presented in this chapter. The review starts in Section 2.1 with a discussion about how theories of teaching and learning have undergone a series of upgrades; this leads to Section 2.2, which focuses on innovations in language learning, theories on language acquisition, theories on reading and critical reading, and research undertaken with secondary school students. Section 2.3 discusses ICT history, how ICT use has developed in education and the challenges and improvements provided. Section 2.4 addresses the TPACK framework, which is the conceptual framework used in this study. The discussion starts with an explanation of the framework, followed by the linking of the previous sections together to discuss issues of technology and its integration in classroom teaching, and finishing with a review of TPACK's pros and cons. Section 2.5 discusses the SAMR model, including its benefits and issues. Finally, a summary of the literature review chapter is provided in Section 2.6.

2.1 Pedagogy

2.1.1 Teaching Evolution

Teaching nowadays is built on the idea that the student should be the focus of teaching instead of the instructor who is teaching, as was the traditional practice. These changes were prompted by social, economic, and cultural changes during the 19th and 20th centuries that were reflected in teaching as a profession and in pedagogy as an academic discipline having various theoretical concepts. Most modern approaches to teaching share a common interest in offering students experiences to construct understandings and develop their own knowledge, with educators producing interactive instructions involving cycles where activities designed by the teachers (and usually complying with a curriculum) lead to learning and feedback (Bada & Olusegun, 2015). The process of self-constructing meaning gives students opportunities to apply their learning in school by promoting problem-solving and critical thinking in a safe learning

environment. This self-construction of meaning is a necessary practice for students to become independent and critical thinkers (Council, 2000).

Although today there are several different approaches to teaching, some basic principles are common, such as the following (Bedoya & Arango, 2012; Mattar, 2018):

- Learning should be an active process in which the student participates or interacts with the learning activities and processes, as opposed to passively taking in the information and memorising to recite back.
- Learning is achieved in a given context; therefore, understanding the contextual influences on student learning is critical.
- Learning is mediated by the teacher or instructor, who is part of the context and acts as facilitator and designer of the context where the learner is encouraged to use their own abilities to achieve learning.

These three principles are elaborated and discussed in the following sections.

2.1.2 Education as an Active Process

Learning is an individual, active process where the accommodation and assimilation of information through direct experiences, including recognising mistakes and the continued search for solutions, are vital towards learning. Activity, actions, and operations configure a system that serves as the basis for the construction of knowledge (Bonwell & Eison, 1991; Daniels, 2016). Therefore, education nowadays is considered an active process and contrasts with the traditional passive approach to learning, where the teacher mainly provided information to the students and assumed their understanding of the subject.

For education as an active process, the instructional approach and content material are of the utmost importance, since information introduced as a way of solving a problem serves a purpose and becomes a tool, instead of being an arbitrary fact that students cannot utilise to make sense of new information and ideas. Consequently, teaching requires the presentation of well-connected activities that lead students to use their previous knowledge and link, reflect on, and practice it with the new knowledge, which allows them to process and then understand new material (Gee, 2007; Rosenshine, 2012).

To research the design of active-learning experiences, Chiu and Cheng (2017) conducted a 2-year longitudinal study on active learning from the students' perspective via an online survey, selecting a total of 306 courses (195 from arts and humanities, and societies, social, and business organisations, and 111 in the area of science and technology). Their findings indicated that, first, the students thought that the active-learning scenarios of the sampled courses were better designed and were more encouraging. Second, active learning had a positive relationship with creativity and nurturing innovation, regardless of the academic achievement of the students. This result of improving creativity was also documented in research on learning English language; Demirci and Yavaslar (2018) found that while active learning yielded positive learning outcomes (like the ability to recall the meaning and pronunciation of new words), students also learned in a fun classroom environment, where creativity and imagination were encouraged and developed.

Another current method for active-learning experiences, which will be further explained under Section 2.3, is the "flipped classroom", an approach that transfers part of the teaching and learning process outside the classroom in order to use class time for the development of meaningful learning, thus allowing students to have an active and individual learning process. Hung (2015) researched the impacts of flipping the classroom on 75 English language learners' academic performance (through end-of-lesson assessments), learning attitudes (by means of a post-intervention learning experience questionnaire followed by semi-structured interviews), and participation levels (as measured by the lesson study logs on the students' out-of-class study time and effort). His findings are positive, referencing how this active-learning approach allowed the students to participate more in the classroom thanks to the previously learned content outside class time, providing the chance to preview and review the content based on their needs and at their own speed. The advantages observed by the author led them to contend that the flipped-classroom approach more effectively supported student learning when compared to the traditional classroom method.

2.1.3 The Influence of the Social Context

Knowledge acquisition is a profoundly social phenomenon composed of social experience and interaction with others, artefacts, and ideologies that shape how individuals interpret the world and thus, construct meaning (Hausfather, 1996;

Vygotsky, 1980). Cognitive structures do not arise or transform solely through the activity of a thinker who seeks to give meaning to their world, but are also shaped by the tools and signs that society and culture provide to said activity. Therefore, these tools and signs enable transformations to take place in the physical and social context. The practical activity that results in these transformations and the artefacts created and used to carry them constitute an indivisible unit, without which it is not possible to understand the origin and development of thought. In other words, the tools at our disposal determine the scope and limits of our constructive activity and consequently, our thinking; therefore, knowledge has a social origin and its manifestations emerge from specific historical-cultural conditions (McLeod, 2014).

The school, as a representation of the education system involving education policymakers, teachers, and principals, is a social institution that organises the learning experiences necessary for the development of higher order cognitive capacities by students (i.e., concept acquisition, systematic decision-making, and problem-solving) (Turkkahraman, 2015; Woessmann, 2016). The effectiveness of these schools as mediators in the construction of higher forms of thought depends on the ways in which educators manage the contexts, tools, and interactions involved in facilitating the constructive activity. First, a pedagogy developed from the notion that knowledge is a constructed product of human activity must take into account the cultural and institutional contexts or settings of the schools in which such knowledge development and education take place. The school is not merely the setting in which the education and development of the subjects take place; the school is a living system, an authentic cultural ecosystem whose own development is interwoven with the development of the students. To understand the extent to which socioeconomic context affected 709 students from the sixth year of primary education in public schools in Asturias, an autonomous region in Spain, where Fernández Sanjurjo et al. (2018) used two instruments: first, a student socioeconomic survey for collecting the participants' information on their social, cultural, and economic background; and second, a science content-acquisition test designed to evaluate students' knowledge of the curricular content of natural science. The research reports statistically significant differences in students' performance according to their socioeconomic context, with students from middle and higher social environments (including types of schools) achieving better

grades than those from lower economic backgrounds; the authors claim that students' social background should be considered when designing and implementing courses.

Since human development is subject to historical, cultural, and social processes, cooperative group and team learning becomes an option in which the potential offered by the group for learning is beneficial through the establishment of multidirectional channels of social interaction. Such channels promote the joint realisation of learning activities, creating situations for the shared construction of knowledge, structuring effective social interaction systems that promote scaffolding situations between students. In summary, fostering a learning culture and an environment based on mutual help and social interactions between learners, teachers, and institutions presents an opportunity for cooperation that will allow for a more meaningful construction of knowledge. Hwang et al. (2019), in a study involving peer tutoring, provide evidence that the social interaction between peers improves learning outcomes when compared to individual students finding solutions by themselves. In their research, involving 60 students of an English-as-foreign-language (EFL) course, the 32 students who participated in peer tutoring activities had their cognitive abilities transition from a basic to a higher level, with more vocabulary words learned and a better use of them than the 28 students who worked independently and showed lesser improvements. The authors discuss how these enhancements illustrate not only the importance of the peer-to-peer approach, but also how the tutoring system scaffolds the learning of both tutors and peers since both parties are required to actively engage with the learning material in order to participate, which relates to the previous section on the importance of active learning.

2.1.4 The Instructor as Facilitator

Over the years several pedagogical models have emerged, and some indicate that to capture the mix of factors affecting student learning, such as students' attention, interest, and motivation to engage in a learning task, the task must be within the zone of proximal development or ZPD. ZPD was first described as a motivational "sweet spot" where learning challenges are balanced with the learner's capabilities to improve in a required subject as a joint activity between peers (Eun, 2019; Vygotsky, 1980). Learning is achieved when the learning experience is within the ZPD. When an instructor or expert (a parent, teacher, or more knowledgeable partner) initially facilitates – *teaches* – the learning activity to a less knowledgeable person, gradually,

the two begin to share roles and increase interactions during problem-solving, with the inexperienced person taking the initiative to ask questions and test understandings and the expert correcting/guiding when the person makes mistakes. Eventually, the expert relinquishes control and acts as a supportive audience, a fundamental expectation of good teaching.

Further to the above discussion on the importance of social interaction for constructing knowledge, the relationship with the environment also has significant implications for teacher–student interactions. Teachers build learning scaffolds that promote meaningful learning by bridging the cognitive skill gaps in students. In this way, students, based on their previous knowledge and supported by the guide or help provided, are able to progress gradually towards successive zones of proximal development (Martínez-Díaz et al., 2011a; Wood et al., 1976). Scaffolding refers to the assistance that the teacher or the most qualified peers provide to the learner, which serves as a support structure or guide to carry out learning tasks that they would not normally be able to carry out on their own, given their current state of knowledge.

In a 12-week action research project conducted by McMullan and Sutherland (2020), the authors effectively created an active-learning collaborative context where, coached by the teacher, struggling adolescent readers improved their self-concept and comprehension. To achieve this, the leading teacher used three consecutive cycles as a scaffold, starting with a teacher-led cycle and building towards the third cycle, which was led by the students. During the first cycle, the teacher intended to teach students how to be active and metacognitive readers, while monitoring their comprehension skills to identify and address their gaps in understanding. The second cycle was built from the students' feedback and became less rigid, having the students practise comprehension strategies in small-group and whole-class reading, while the teacher monitored and was available for questions. This collaborative reading was described as the "most helpful" by the students, which also supports the collaborative learning pedagogy with peers discussed in the previous section and the relevance of the teacher to their construction of knowledge. Finally, the third cycle responded to the students' wish to read the set text in groups, aloud or silently. The teacher's role changed to one as facilitator, for students developed comprehension jointly, with the more prepared readers serving as instructors of the less knowledgeable ones.

The literature on pedagogy and teaching practices has several different views, but collectively they work towards achieving the educational goals of students, nations, and institutions. Several researchers discussed above concur that knowledge is constructed through social interactions (digital or analogue) and that it is embedded in the social context in which the knowledge is used. Thus, knowledge can be co-constructed through peer-to-peer or teacher-to-peer interactional processes such as collaboration, cooperation, and coordination. This co-creation of knowledge can be understood from a five-level engagement matrix called the passive-participatory model (Romero et al., 2016), which distinguishes five levels of educational use of ICT depending on the degree of engagement experienced by the learner. In Level 1, the student is a passive receiver of information. Level 2 builds on the interactivity provided by the ICT to the learner, but it is understood that the student is still just receiving, not creating. Level 3 comprises the production of content by the learner in response to a learning scenario. In Level 4, the learners are engaged in the social co-creation of content related to a given learning situation or moment using digital tools – for example, by collaboratively conducting data collection and co-creating texts, videos, or other kinds of content; thus, students share their experiences and knowledge and their relevance within the group. Finally, Level 5 is also a social co-creation scenario, but its main difference from the previous levels is that the learning is contextualised; therefore, the co-created knowledge aims to identify, understand, and problem-solve situations within their community, while also engaging people outside the classroom like parents or politicians.

In summary, teaching is a tool that facilitates collaboratively constructed knowledge in a given environment, where meaning is individually created by the learner through one or many pathways. Teachers are part of the environment where learning occurs, and their role is one of facilitator, designer of experiences, and collaborator of the learner, who is an active constructor of their own knowledge.

2.2 Language and Reading

2.2.1 How It All Begins: Language and Language Acquisition

Language acquisition is the process by which humans acquire the capacity to identify and comprehend language, as well as to generate and use words, sentences, and a range of tools including phonology, morphology, syntax, semantics, and an

extensive vocabulary. This process is innate in human children and develops naturally under normal circumstances (Pinker, 2003), allowing children to have a native tongue.

Currently, *behaviourist*, *nativist*, and *social/cognitive* are three basic approaches based on the type of influence exerted by certain external and internal factors on language acquisition that can be described (Mohamad Nor & Rashid, 2018). The behaviourist approach understands language as any other human behaviour that is acquired according to the operant conditioning theory, which explains that through the stimulus-response-reward process, adults around children recompense their correct vocalisation, grammar, new vocabulary, and the formulation of questions and answers (Skinner, 1985). In essence, this approach asserts that children acquire language purely through interacting with the environment.

Nativist scholars argue that language acquisition is both natural and universal to humankind due to a genetic mechanism called language acquisition device (LAD) that allows children to learn and understand language naturally, through procedures not dependent on the environment, meaning the language developing processes are innate to children (Hauser et al., 2002; Pinker, 1995). Thanks to LAD, humans have four abilities: (a) discerning human-made speech sounds amid other environmental sounds; (b) categorizing linguistic occurrences into diverse refinable categories; (c) understanding the feasibility of specific linguistic structures compared to others; and (d) assessing the accuracy of language production. These cognitive components combined build the theory known as universal grammar. According to universal grammar theory, the basic brain organisation principles – syntactic, semantic, phonological, and non-specific – are common and imposed on all languages, with differences among languages in terms of rules for sentence structure, pronunciation, and word insertion (Chomsky, 1986, 2006). The validity of this approach is still debated, as so far, scholars have been unable to scientifically prove the existence of the genetic mechanism for language acquisition (Lin, 2017).

The third approach is the social/cognitive perspective. This perspective emphasises the role of feedback and reinforcement in language acquisition, like the behaviourist approach, but understands the existence of mental structures inherent to the child, similar to the nativist approach. In this regard, the process of learning is affected by the context, where social, cultural, and historical factors converge. As previously discussed in Section 2.1.3, The Influence of the Social Context, learning

occurs within social interactions (Vygotsky, 1980; Wertsch, 1991). These interactions facilitate the role of feedback and the ZPD in native language acquisition, elucidating how language processes are acquired with the assistance of capable adults.

As children develop, language comprehension becomes increasingly important, since children with stronger linguistic skills tend to outperform their peers with weaker linguistic skills on assessments of literacy abilities in school, and this gap appears to widen over time (Torppa et al., 2006) and continues into secondary school. As this research is about critical reading, it is important to argue how the speaking process of the native language is the critical foundation for learning to read (Muter et al., 2004).

2.2.2 Reading and Critical Reading

Reading is conceived as the ability to understand and interpret any expression that can be read. From this perspective it is possible to read events, images, expressions. and symbols, among other things, and therefore, reading is not solely determined by the act of reading the oral or written text, but rather by understanding symbolic representations that have their origin in the interaction of humans with each other and with the natural environment in which they develop (García-García et al., 2018b). Helping students achieve reading proficiency is arguably the most important goal of teaching (Jang & Ryoo, 2019), and therefore, this section presents a review of research documents associated with the conceptualisation of how reading occurs, how reading is understood, and how reading benefits every individual in the 21st century.

In the Colombian education context, the National MOE is charged with every education policy nationwide. Among the policies enforced lies the framework named "National System of Standardized Evaluation of Education", which promotes and measures critical reading as the ability of students to understand, interpret, and evaluate any verbal and non-verbal text (MEN, 2014). To evaluate the level of reading proficiency by students, the MOE established three key components that must be developed and tested in Colombian schools: *semantic* component, *syntactic* component, and *pragmatic* component (Icfes, 2020; Márquez Hermosillo & Valenzuela González, 2018). These three components line up with Cassany's dimensions to critical reading (de Barón, 2016), which have been studied in the literature and will be explained and used to expand the understanding of these components.

The semantic component involves the ability of the reader to understand the meaning of words, expressions, and phrases that appear explicitly in the text and the semantic relationships that exist between the different elements that make up a sentence. This is an operation that enables the reader to understand *what* is stated in the text, and in the absence of this component, it is not possible to have the next two components (Icfes, 2020). The semantic component aligns with Cassany's *reading the lines* dimension, which describes the student as a passive receiver who only extracts information during the first encounter with a text (Cassany, 2003; de Barón, 2016).

Next, the syntactic component involves the reader's skill in identifying implicit information from the explicit structure of the text (Icfes, 2020), which relates to Cassany's *reading between the lines* dimension. It establishes that reading is a process of a psycholinguistic nature, where the reader plays an active role since it is up to them to construct the meaning of the text as a result of the reader-text interaction (Cassany, 2012). The act of reading requires knowing the linguistic aspect of the text (*reading the lines*) but also reactivating cognitive abilities inherent to interpretation. Therefore, reading not only implies detecting explicit information, but also recovering implicit information to build meaning, which is achieved through the application of cognitive processes like recalling previous knowledge, formulating hypotheses and verifying them, discovering how the elements of the text are articulated to build their global meaning, and interpreting from thought processes such as association, inference, analogy, comparison, and recontextualisation (Cassany, 2021). In consequence, the meaning of the text does not reside only in the words, phrases, or sentences, but is also in the mind of the reader, who elaborates meaning according to their previous knowledge, life experiences, ways of thinking, feelings, and their own sociocultural contexts.

Finally, the pragmatic component relates to what the text states depending on the communicative context (Icfes, 2020). It corresponds to critical reading or *reading behind the lines* (Cassany, 2012), a dimension that considers that the text, the author, and the reader are related socially, culturally, and ideologically when they write and read (Cassany, 2003; Márquez Hermosillo & Valenzuela González, 2018). Consequently, the reader constructs meaning by drawing upon their knowledge of the author, the context in which the text was written, and their own sociocultural background, reading objectives, attitudes, values, and position in society. This

meaning is, therefore, a product of both the linguistic code present in the text and the reader's background knowledge. However, it is important to note that the meanings of words, expressions, phrases, sentences, and even the reader's prior knowledge all originate from a social context; texts do not exist in isolation but are always influenced by the personal and sociocultural contexts of the author, including their worldviews, perspectives, ideologies, beliefs, and emotions. Thus, text, author, and reader are not independent entities; rather, they are intertwined factors shaped by various environmental elements within the reading process.

Therefore, in this thesis I understand critical reading as the ability to evaluate texts on multiple levels of complexity. It goes beyond literal comprehension to include understanding communicative intentions, implicit content, structures, and discursive strategies. Critical reading considers the author's worldview, context, and argumentative elements while recalling information from multiple texts, applying literary analysis concepts, and considering context. This process enables the reader to formulate critical stances, propose solutions, and generate reading hypotheses based on text ideas. Critical reading also recognises that texts, authors, and readers are interconnected within social, cultural, and ideological contexts, where meaning is constructed from both linguistic elements in the text and the reader's background knowledge.

In every process of critical reading, these three dimensions converge simultaneously in the mind of the reader (ICFES, 2019), since at the moment when the reader captures the explicit information, according to their cognitive abilities, the reader extracts hidden meaning that emerges and is influenced by the reader's sociocultural circumstances and those of the author. The process allows the reader to reflect on the text, evaluate it, and assume critical positions.

The importance of helping students to achieve critical reading is twofold, and an element closely related to assessing the content and pedagogical knowledge of teachers in Bogotá DC, one of the secondary objectives of this research. First, as stated in Chapter 1, critical reading has a significant positive effect on individuals' understanding of the world, which in turn may contribute to national economic growth. Second, critical reading becomes pivotal to improving society, not only because it contributes to the formation of readers capable of understanding the explicit and implicit content of any type of text, but also because critical readers are more open to reasoned argumentation, the free exchange of opinions, respect for other people's

ideas, tolerance, and self-control in the face of criticism (Cassany, 2012; de Barón, 2016). As consequence, critical reading leads to empowered readers, capable of reasoning and questioning their world and society and who have a voice over the contexts they live in and how to improve them and reshape their communities for better (Luke & Woods, 2009; Medlock Paul, 2016). Empowering the reader provides confidence and helps facilitate a constructivist approach to learning,

2.2.3 How to Teach Critical Reading in Secondary School

Since the aim of this research is to focus on language teachers and how they currently teach critical reading in Spanish language at secondary school level, it is relevant not only to understand how reading and critical reading occur but also to gain insight into the existing literature regarding the reading skills of secondary school students. Expanding on the earlier points discussed, it is crucial to acknowledge that the act of reading is heavily influenced by its sociocultural context, even during later stages such as early adolescence, which characterises the secondary school years. There is a prevailing belief that Colombian students should possess proficient reading abilities by the time they reach secondary school (ICFES, 2018). However, many students often have not yet reached this benchmark. In fact, as noted in Chapter 1, the 2019 PISA results indicate that 23% of 15-year-olds in OECD countries have inadequate reading literacy (OECD, 2019a), The demand for reading text information significantly increases in the school system during secondary school (around 15-year-old students), and thus, reading comprehension becomes increasingly important in secondary grades, where text is a primary source of communication students use to learn content and construct knowledge independently (Oslund et al., 2018). However, unfortunately, direct instruction on reading during these learning periods is reduced (Lee & Spratley, 2010). The pattern of reduced focus on reading text information can also be seen in Bogotá's schools as per their performance in recent PISA tests.

The literature about education, and particularly the literature about literacy teaching and learning, indicates how teachers can help improve the reading comprehension of secondary school students by engaging in different pedagogies, using social support, and providing a purposeful and engaged reading experience (Cassany, 2012; Goldman et al., 2016). These will be explained further and connected to research in the following paragraphs. These three strategies resonate with the current

principles of pedagogy explained in Section 2.1: education as an active process, the influence of the social context, and the role of the teacher as a designer and facilitator of the learning experience.

First, purposeful and engaged reading means the teacher is able to create active-learning strategies where the students transcend the mere completion of end-of-chapter questions or assessment performance by engaging in continuous communication (Goldman et al., 2016). It is through this constant interaction between the teacher and the students that the latter can acquire the ability to comprehend, interpret, and engage with any written text (Rupley et al., 2009). The establishment of a purpose for each reading activity is achieved through essential questions or explicit unit objectives linked to students' own experiences. Abstract or distant topics should be introduced with age-appropriate analogies that enable students to leverage familiarity and connect these topics to their own lives. Explicit reading purposes position students to approach text deliberately, either to seek information or to consider a contentious issue, enabling them to measure when they have gained sufficient information and knowledge towards addressing the guiding question.

An example of this purposeful reading is the research by Guthrie and Klauda (2014), who observed that students improved their comprehension of informal texts when teachers provided competent support, offered reading choices to increase intrinsic motivation, highlighted the importance of reading (to foster value), and organised collaborative activities towards increasing the time of engaged reading activity. Similarly, the research of McMullan and Sutherland (2020) indicates how crucial it is for teachers to engage in supportive pedagogy towards developing struggling readers' skills at the same time as their motivation, enjoyment, and self-reading concept. In their research, the teacher used her professional understanding of what her students found challenging and needed to develop to become successful readers and paired it up with three cycles of action research. Her strategy focused on introducing new concepts in a collaborative and interactive reading space that improved the motivational and engagement aspects of reading with struggling adolescent readers, while also developing comprehension abilities using extended texts through the constant support of the teacher for achieving higher level understanding of the texts.

Second, social support builds upon the previously discussed influence of the social context (Section 2.1.3) in the strategies to achieve critical reading (Goldman et

al., 2016). Through these strategies, students engage in discussions to explore similarities and disparities in their thought processes and responses to the texts studied. These whole-class discussions provide teachers with opportunities to demonstrate the use of academic language and disciplinary discourse forms, impart essential content-related knowledge, and push students' thinking using various discourse strategies like restating, encouraging elaboration, and highlighting or contrasting responses that may be perplexing or contradictory (Asterhan et al., 2015). The effectiveness of this group work depends on well-defined tasks, individual and group accountability, and opportunities for discussion, debate, and written expression. These group activities also necessitate students using textual sources as their primary data for addressing questions or completing tasks.

An example of social support is found in the research of Swanson et al. (2017), who demonstrated that eighth graders who had reading difficulties improved their knowledge acquisition, content and critical reading comprehension, and vocabulary recall after a year-long intervention where the teacher adopted an active-learning approach that was social mediated and accompanied by instruction. The experiment involved five activities. First, *comprehension canopy*, a short 10-minute presentation on the subject to be discussed. Second, *essential words*, an activity where the teacher introduces four to five high-utility, high-frequency concepts using a student-friendly meaning, visual representation, associated words, sentences with the word in context, and finally a short discussion of the word with the students. Third, *warm-up*, every lesson started with a 5-minute review of an essential concept with an activity that required students to use the word in an everyday context. Fourth, *critical reading*. In these sessions, students were tasked with reading primary and secondary sources of text either as a whole class or in groups based on the perception of the teachers about the students' needs. The teachers would engage students in classroom discourse, scaffolding the essential words and previously learned material. Fifth, *team-based learning* was used, which allowed students opportunities to engage in text-based discussions and provided text-based support to their ideas, followed by a team-solved quiz to apply the knowledge acquired from text and discussions.

The third theme is engaging in different pedagogic strategies, and it refers to employing various instructional approaches that focus on helping students connect and integrate new information with their existing knowledge base (Goldman et al., 2016).

This approach aims to promote a deeper understanding of the new content and enhance long-term retention. To achieve this, educators activate students' prior knowledge through various means, including discussions that relate familiar contexts to new ideas and explicitly linking this prior knowledge to relevant aspects of the new material. Specifically, activating students' prior knowledge of the subject matter can be done through techniques like previewing headings and concepts, making predictions, and charting results to increase student interest (Marchand-Martella et al., 2013). The goal is for students to leverage their interest to establish meaningful connections with the text they are reading. Furthermore, to comprehend texts at a deeper level, students are encouraged to make intertextual links, connecting ideas from one text to another. This can be facilitated by teachers, who strategically select texts with related issues or topics, providing students with the tools they need to make these connections (Marchand-Martella et al., 2013). This process goes beyond the traditional methods of assessing learning, such as answering end-of-chapter questions or writing essays solely for the purpose of recalling facts and dates. Overall, this pedagogical approach recognises the value of connecting new learning with prior knowledge to foster motivation, reading engagement, and a deeper understanding of the material (Goldman et al., 2016). It often involves structured activities that encourage students to make meaningful connections while reading, ultimately enhancing their comprehension and retention.

Regarding language teaching and critical reading in Spanish language in Bogotá, the literature is scarce, but the following articles discuss findings from research studies in different locations in Colombia for students in secondary school: Smith Avendaño de Barón and González González (2020), de Barón (2016) and García-García et al. (2018a). The results of the three studies reveal that students in these locations could not successfully achieve the *reading between the lines* dimension of reading, since it was difficult for them to discover the implicit meaning, reflect on it, and take reasoned critical positions. Pertaining to the teachers, de Barón (2016) states that they misunderstood critical reading and ultimately developed poorly designed experiences, with lessons taken verbatim from guidebooks and without any concern for the students' interests, thereby undermining student motivation to learn. These teachers also stated that students were the generators of difficulties in achieving critical comprehension, thus the students were responsible for their poor learning outcomes, while teachers avoided responsibility and self-critique. Similar results about teachers

are reported by Smith Avendaño de Barón and González González (2020), who commented on how teachers lacked the use of appropriate and engaging reading materials, in addition to avoiding the use of interesting new media texts reported to improve motivation and critical reading of students, like movies, comics, video clips (Gee, 2009), or interactive material such as video games (Hamari et al., 2016).

Acknowledging that traditional teacher-centred lecture techniques are still predominant in education (Roehl et al., 2013), it is also relevant to understand the importance of providing teachers with knowledge about the new digital tools at their disposal, since even if teachers are only a minor part of the issue (Nicholas & Fletcher, 2017), their knowledge and proximity to the students has them better positioned than researchers and policymakers to provide longer term interventions and thus improve the reading comprehension of their students. Consequently, it is crucial to provide Spanish language teachers in Bogotá's secondary schools with the right tools at the optimal moments during the educational process to achieve the expected reading outcomes for students, which is why this research aims to assess teachers' technological readiness and fluency with ICT tools.

This section has discussed language acquisition and reading comprehension in education. It explored three approaches to language acquisition – behaviourist, nativist, and social/cognitive perspectives – and emphasised the critical role of language comprehension in learning to read, and to *critical reading*. The concept of critical reading was introduced and defined. The section also highlighted the importance of teaching critical reading skills in secondary schools, especially in the Colombian education context. It discussed how teachers can improve students' reading comprehension through purposeful and engaged reading, social support, and various pedagogical strategies that connect new information with prior knowledge. Finally, it mentioned the importance of equipping teachers with knowledge about digital tools to enhance their teaching methods and improve students' reading outcomes. The next section discusses digital tools in more detail.

2.3 Information and Communication Technologies

Section 2.1.1 discussed how teaching has evolved due to sociocultural challenges. In addition to these changes, teaching and learning processes have evolved further due to education technology innovations over the last two decades (Majumdar, 2015; Voogt

et al., 2013). These have been stimulated by broader ICT innovations, which have contributed to an steep growth in knowledge (Bornmann & Mutz, 2015) and a steady global growth in access to technology, enabling better infrastructure (World Bank Group, 2016) and the integration of new software and hardware (Trelease, 2016). The instant access to a large repository of information on the worldwide web and the ability to communicate instantaneously have reshaped the world and consequently, how educators and policymakers design and deliver teaching and learning strategies (A. J. Delgado et al., 2015). This access has also boosted the collaboration of educational agents and prompted policymakers and international agencies to promote the benefits of ICT in education, as digital technologies can make economic and educational development more inclusive, efficient, and innovative (Hammond, 2014; Keane et al., 2016).

Nevertheless, the constant progress of ICT innovations is challenging for all education stakeholders (Choudhury & Pattnaik, 2020), with institutions and administrators attempting to incorporate ICT and digital literacy as demanded by politicians and the general public (William E Bertrand, 2010) to achieve the aforementioned benefits. Ironically for the digital age, the first barrier found was physical: Access to infrastructure is critical for the success of any digital education strategy, which meant that policymakers had to first address the matter of providing the hardware and connectivity necessary for teachers and students, since without access no measurable impact on learning can take place (Dotong et al., 2016; Nye, 2015). Therefore, the first approach taken by educational institutions was to purchase the infrastructure, but the high costs (Filho et al., 2018) and rapid evolution of technology makes this approach very costly to sustain in the long run. Stakeholders then realised that students might own the necessary hardware, allowing for a BYOD scheme. Through this strategy, every student provides their own hardware for academic purposes (Grant & Barbour, 2013), reducing the cost for educational institutions, while improving access.

However, with time, stakeholders realised how the BYOD approach created an unequal context, as not every student can afford the same quantity and quality of hardware and software. Briefly discussed in Chapter 1, the *digital divide* is a term used to describe the unequal distribution of access to and use of digital technologies: the difference between individuals, households, companies, or regions in relation to

access, knowledge, skills, and dispositions of ICT (OECD, 2001; Ritzhaupt et al., 2020). Studies have shown that socioeconomic status, geographic location, race, age, and education level are key predictors of the digital divide. For example, individuals from households with higher income and education level are more likely to use the internet for a wider range of activities compared to those from households with lower income and education level (Chetty et al., 2018). This is a sustained problem for education worldwide, as low-income students or residents in poorly connected areas struggle to profit from and enjoy the same benefits that their richer, better connected counterparts experience (Resta & Laferrière, 2015). Developing countries like Colombia, and conditions like Bogotá's, offer a brewing ground for the digital divide, as deeper socioeconomic, political, and contextual issues exist for successfully integrating ICT in education (Botha, 2016); infrastructural problems, deficient political will, and poverty threaten to exclude a large number of students and institutions from the possible benefits provided by ICT (Mancilla, 2014).

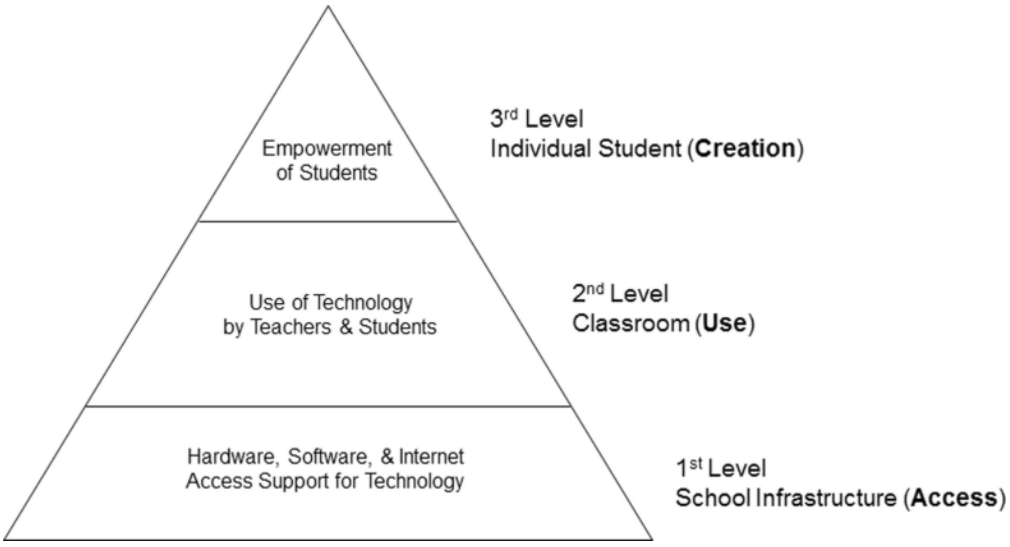
Socioeconomic status has emerged as a significant determinant of digital technology accessibility and use, according to research (Chetty et al., 2018). Moreover, geographic location constitutes another factor influencing the digital divide, with rural regions generally experiencing limited access to high-speed internet and other digital technologies relative to urban and suburban areas. This digital divide can hinder individuals' capacity to access online resources, engage in remote work or education, and avail themselves of telehealth services. Addressing the digital divide necessitates interventions targeting the facilitation of equitable digital technology access, particularly in regions and among groups currently underserved, as a means of fostering digital inclusion and mitigating the deleterious impacts of digital technology inequity.

To understand the digital divide in schools, Ritzhaupt et al. (2020) review a three-level framework (Figure 2.1) that builds up from access to ICT as the first issue to be faced, as previously established. Classroom use of ICT is the second level, concerning teachers' professional development towards ICT use, access to ICT support, and teachers' agency for ICT, and how the lack of these may cause unequal learning experiences with ICT resources for students even if the access is equal among them. Lastly, level three involves students and creation, understood as the ability of students to use the integrated ICT resources in their schools to effectively gain the educational benefits of the ICT for their academic and future lives (Hohlfeld et al.,

2008). Since ICT integration for teachers is the main objective of this research, highlighting that the second level is a prerequisite for level 3 becomes relevant, as teachers deciding and being able to successfully teach with ICT leads to students using these resources for their own improvement (Ertmer et al., 2012).

Figure 2.1

Levels of the Digital Divide in Schools



Note. Adapted from "Examining the Digital Divide in K-12 Public Schools: Four-Year Trends for Supporting ICT Literacy in Florida," by T. N. Hohlfeld, A. D. Ritzhaupt, A. E. Barron, and K. Kemker, 2008, *Computers & Education*, *51*(4), pp. 1648–1663 (https://doi.org/10.1016/j.compedu.2008.04.002). Copyright 2008 by Elsevier Ltd.

But how does the integration of technology with education service provision occur? If access to the basic infrastructure is resolved, teaching strategies become central, for the effective use of ICT depends on the different ways that teachers make use of the resources available (Webb, 2014), involving either the creation of new learning experiences or the redesign of the existing ones (Prestridge, 2017). The following sections will discuss how teachers have developed different teaching strategies using ICT, with examples from the literature.

2.3.1 Online Learning

A change in delivery of teaching subjects has been made possible by technology with the advent of online distance learning. The main benefit of this is increased access to learning opportunities; this benefit grew in importance during 2020–2021 worldwide

and was accelerated due to the COVID-19 pandemic (Dhawan, 2020). With the availability of online learning, students can choose to attend classes in an institution either face to face or online, or using a combination of both methods. If a student attends the majority or all of their courses online, then an online learning scenario is being used (Moore et al., 2011). Growing in popularity as more people have better access and more institutions develop better online programs, online learning acceptance is high (Henderson, 2021), as demonstrated by the 6 million students participating in at least one online course in higher education institutions during 2015 in the US alone (Allen & Seaman, 2016) and the increased growth of online learning in Chinese universities during 2020 forced by the coronavirus pandemic (Dhawan, 2020).

The use of online learning brings several pedagogic benefits, including cost savings, flexibility of time for students, asynchronous interactivity, and fewer scheduling conflicts (A. J. Delgado et al., 2015), while motivating students to interact among themselves, thereby improving relationships and creating a good context for the social interactions needed for learning, as previously discussed in Section 2.1.3 (Arkorful & Abaidoo, 2015). The challenge for a high-quality approach in online learning comes from designing meaningful and relevant online learning materials that are issued in a way that allows teachers to use them (Kebritchi et al., 2017), for just digitised print materials are not good and do not maximise the benefits of online delivery. Some of the academic literature on online learning reports that participants displayed higher learning outcomes and self-efficacy and also had a positive attitude to working in groups (Gupta & Bostrom, 2013). In other research, high school students enjoyed online learning in after-school settings. These students were better peer-supported, interest-driven, and production-focused. The groups also involved student from different ages, involved pursuing shared goals and use openly networked infrastructures. Comparing information exchanges in after-school and school settings, the former are notably less restricted, leading to improved peer support and engaging others towards a shared purpose to take advantage of new networks (Davis & Fullerton, 2016).

2.3.2 Blended Learning

Strategies that aim to blend digital educational materials and online interaction with traditional teacher-driven classroom methods are called blended-learning strategies (Friesen, 2012). Although definitions of blended learning change from

context to context due to new innovations and differences in infrastructure, the general idea behind it is the combination of traditional in-person teaching with digital or online learning elements. It aims to create a more flexible and effective learning experience by integrating the advantages of both face-to-face instruction and technology-mediated learning. In a blended-learning environment, students engage with course materials through a variety of methods. This typically includes attending physical classroom sessions where they interact with instructors and peers. Additionally, students access online resources and participate in virtual activities, discussions, or assessments. A key characteristic of blended learning is its flexibility in terms of when, where, and how students learn. It allows learners to progress through the content at their own pace, revisit concepts as needed, or move ahead if they grasp the material quickly. ICT integration plays a crucial role, with digital tools, learning management systems, and multimedia resources enhancing the educational experience (Graham et al., 2013). Blended learning encourages active engagement through interactive elements, collaborative projects, and multimedia resources. Instructors take on a more facilitative role, guiding students' online activities, leading discussions, and designing meaningful in-person learning experiences. The current literature on blended learning discusses how this strategy improves students' attitudes towards learning and that it increases motivation, engagement, and even increased learning because of the delegated responsibility (Talley & Scherer, 2013; Zengin, 2017).

An example of the use of blended learning for literacy teaching strategies is the research by Fola-Adebayo (2019). This study explored how undergraduates perceived the impact of blended learning on their online critical literacy skills. The participants underwent a 4-week training in a developmental reading course to enhance their ability to critically evaluate web-based information. Data were collected through questionnaires and focus group discussions, with findings revealing how most students favoured the blended-learning approach and reported several benefits, including improved ICT skills, additional knowledge acquisition, flexible scheduling, ease of expression, enhanced literacy skills, and the formation of learning communities. The study also established a positive statistical relationship between exposure to blended learning and the development of online critical literacy skills. Many students believed that blended learning significantly contributed to the enhancement of their online critical literacy skills.

A second example is a recent study that examined the impact of a blended-learning, project-based approach, integrating a school literacy model and character education, on seventh-grade students' critical thinking, metacognitive skills, and opinion expression (Yuni et al., 2023). The studied model significantly influenced critical thinking (88.2% impact), metacognitive skills (80.7% impact), and opinion expression (90.2% impact). The model's emphasis on scientific literacy, active participation, and project-based learning contributed to these outcomes. Blended learning played a crucial role in implementing the model, enhancing cognitive and metacognitive skills, and promoting active and critical thinking.

Another example, which relates to the context of this thesis, is a research project to investigate the impact of a blended-learning approach on developing the reading skills of 58 preservice teachers for primary education who were studying in public higher education institutions in the city of Bogotá DC (Quitián-Bernal & González-Martínez, 2022). The study emphasised the significance of combining traditional paper-based reading with digital screen-based reading in blended-learning environments to enhance preservice teachers' reading skills. While recognising the importance of the tactile and cognitive engagement that paper reading offers, the blended-learning designs aimed to create a balance between physical and digital reading experiences. Digital literacy emerged as a critical aspect for effective integration of ICT into learning models, as an initial assessment revealed that only 37% of the preservice teachers had acceptable digital skills. The study's training strategy prioritised peer learning and technological resources to address these digital literacy gaps. Additionally, collaborative work was highlighted as a valuable teacher training strategy in the design of blended-learning environments, fostering interpersonal, didactic, and technological skills essential for contemporary educational needs.

On the other hand, some researchers claim that blended classroom strategies provide no significant positive impacts (Wilson, 2020). In some cases, there is no significant academic impact because the students find it hard to concentrate and motivate themselves outside the classroom, so the students argue about preferring to learn the topics in class and from the instructor (Smallhorn, 2017). Other students state that they lack the proper time to watch the videos and have difficulties in understanding the topics outside the classroom (Cabı, 2018). The latter is particularly important, for in developing economies like Bogotá's, students may not have the necessary facilities

to study at home, as argued when discussing the connectivity in Colombia in Section 1.7. In consequence, without the proper connectivity to watch videos or access other materials, a blended-learning strategy may see its results compromised, yielding no positive academic results.

2.3.3 Digital Gamed-Based Learning

In the literature, game-based learning (GBL) is defined as a type of game play with distinct learning effects (Shaffer et al., 2005) dependent on *playing* as an essential element in human behaviour through which skills such as critical thinking, problem-solving, and communication can be developed (Qian & Clark, 2016). The importance of GBL comes from one of the main challenges for teachers in their classrooms: to capture the interest and motivation of students to engage in learning goals. GBL helps to ease this reluctance to engage since, when the design of the game is optimal, it can promote students' motivation and willingness to engage with content they could otherwise have perceived as unattractive, thus facilitating learning to occur (Hamari et al., 2016; Rotgans & Schmidt, 2011). Additionally, GBL also provides students with content specific to their level of expertise, thus allowing for modification of the type and complexity of the problems to be solved and the scaffolding provided (Azevedo et al., 2011). Finally, failure is part of any game, and in consequence, failing in GBL is not perceived by students as an undesirable outcome but rather as part of the learning path, which in turn improves students' motivation and engagement (Kim et al., 2009).

Digital gamed-based learning – or DGBL – (Prensky, 2001, 2003) is one ICT integration for education where digital video games can have significant value to improve learning. DGBL describes an approach that integrates a digital game into a learning environment, in which the game plays a central role (Prensky, 2003; Van Eck, 2006, 2015). As a concept, DGBL derives from GBL and attempts to add digital advantages implied in its name to the previously discussed educational benefits provided by GBL. The advantage that DGBL provides is the use of the design logic of video games, which produce an intrinsically high motivational level and come to the classroom as great tools to help the teacher to keep students enthralled in the classroom and exhibit better performance (Woo, 2014). Outside video games, the learning challenges faced by students can be too complex or disorganised; the students may solve the challenges, but do so without achieving meaningful learning. Instead, design progression inside games

provides the student-player with challenges that are frustrating but within their ZPD, pushing the student-player to solve the task and thus allowing them to develop learning and mastery after enough repeated practices in an active scenario (Gee, 2005). Prensky (2001) and Vogel et al. (2006) also agree that video games accomplish this by providing information when needed and granting feedback through interactive guides. This leads to new learning, when the student-player is confronted with a new, more difficult task in a safe environment where the task can be practised until the student develops better strategies without being afraid of failing a test or grade.

Other advantages of DGBL include the potential for students to engage with virtual communities, fostering social competitiveness and collaborative learning both inside and outside the classroom. These virtual communities often form organically, providing spaces for students to discuss game-related challenges and strategies. Using virtual channels like forums and chat rooms, students can participate in a community focused on the video game, allowing interaction, collaboration, and knowledge sharing related to the game's educational content. These communities also offer benefits like asynchronous discussions that can involve participants from different locations and the flexibility to access discussions via various devices, extending learning beyond the classroom (González-González & Blanco-Izquierdo, 2012). DGBL's interactive and immersive nature keeps students engaged, making them active agents of their learning and facilitating knowledge retention (Shute et al., 2015).

Nevertheless, DGBL is not a substitute for teachers but rather a tool to assist them to improve their teaching practice. A video game alone is not a sufficient learning tool. Therefore, it is pivotal to recognise the teacher's role in the adaptation and inclusion of the video games in the learning scenario, including the adaptation of the video games to the curriculum; the organisation of activities using the video games; supporting students throughout gameplay and after their engagement with DGBL; and the design and enabling of the learning environments that support DGBL (Chee et al., 2015) and assess students' learning (Hébert & Jenson, 2019). Consequently, the teacher's role becomes central to DGBL, which has direct implications for the first sub-question of this research: *What is the competency level of secondary school Spanish literacy teachers in Bogotá to use ICT to teach critical reading?* Hence, having a framework to understand the implications and to improve the teachers'

abilities to teach with DGBL approaches becomes central, a subject that will be tackled in the next chapter with the TPACK framework (Koehler & Mishra, 2009).

In regard to language learning with DGBL, several research studies have been conducted. Proske et al. (2014) found that students felt more engaged to write and devoted more time to writing interactive inputs in video games when engaging with mini-games and game-based activities, which is important since practice and attention are considered crucial for learning. In México, Jiménez Porta and Diez-Martínez Day (2018) analysed and selected 20 digital and free commercial (e.g., Minecraft) and educational (e.g., Peak, Find the letters) video games that met the criteria of being in Spanish language, could be used in early Spanish language teaching, and involved the practice of tasks that favoured literacy. The authors found development in four cognitive processes of early readers: first, early alphabet learning for initial readers, by improving the recognition of letters and the correspondence between letter name and letter sound; second, the development of phonetic and phonologic conscience, by codifying and decodifying and learning orthography; third, the structure of language, by improving the student's vocabulary and use of words; and fourth, reading and writing directionality, by improving the students' capacity to understand directions to read and write from left to right and from top to bottom of the screen or page. Finally, the authors argue that under scaffolded instruction, certain technology resources favour the improvement of both reading and writing abilities in Spanish language, but that the resources must be carefully implemented in the classroom, taking into account the literacy level of the students and the types of tasks to be performed.

Another study conducted with 126 university students aimed to investigate the effect of integrating the game-based student response system, Kahoot!, into classroom teaching (Wang, 2015). It employed two distinct cases: one involving the application of Kahoot! once after a 45-minute lecture, and the other where the instructional media was used at the end of every lecture throughout an entire semester. The findings revealed that initial enthusiasm and excitement were common when Kahoot! was introduced but diminished over time, with 57% of the participants expressing their intent to continue using Kahoot! after every lecture, and 75% acknowledging that they had gained valuable knowledge through its use. The research discovered only a slight reduction in motivation and engagement but identified a statistically significant wear-out effect in relation to classroom dynamics. However, the study demonstrated that, on the whole, Kahoot!

effectively enhanced students' engagement, motivation, and learning when employed consistently for 5 months. The competitive nature of Kahoot! emerged as a pivotal factor in sustaining students' attention and interest during prolonged use.

This section has discussed the evolving landscape of education due to sociocultural challenges and technological innovations in the past two decades, driven by ICT advancements (Majumdar, 2015; Voogt et al., 2013). Increased access to technology and the internet has reshaped education, prompting educators and policymakers to rethink teaching and learning strategies (A. Delgado et al., 2015). However, challenges like the digital divide based on socioeconomic status and geographic location persist (Chetty et al., 2018), hindering equitable access to digital resources. In this landscape, several new pedagogic approaches have appeared. The different approaches, tools, and strategies that coexist in today's educational reality are important for this research project since they provide the basis for assessing how teachers in Bogotá are helping their students to build new knowledge in critical reading with the help of the vast array of information and techniques available. The following questions arise: Are the teachers aware of the strategies and tools at their disposal? If yes, how are they engaging with them? How is ICT being used for educational purposes in general? The next section on convergence will address some of these questions.

2.4 Convergence for Learning: Pedagogy, Content, and Technology – the TPACK Framework

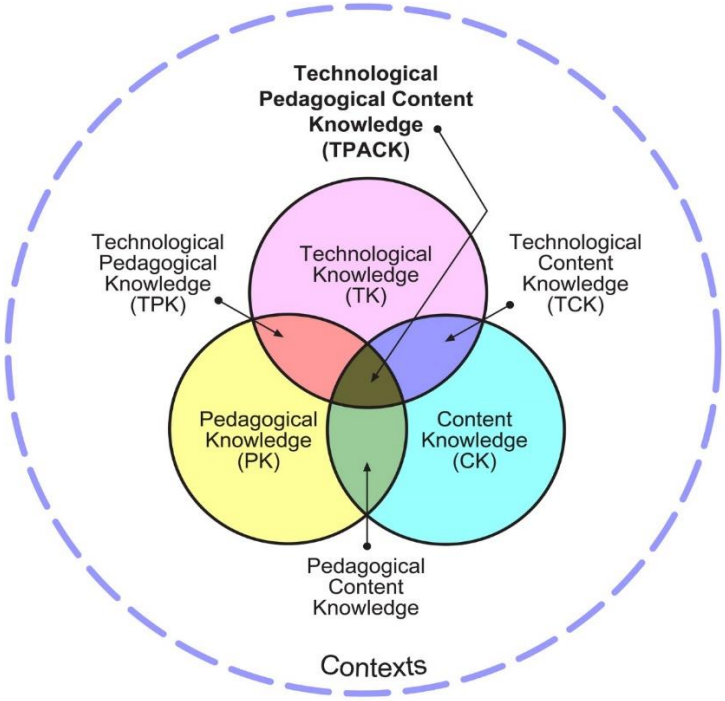
The previous three sections explored pedagogy, language, and technology. To answer how language teachers at secondary school can integrate ICT tools towards helping their students to achieve critical literacy (the research problem presented in this thesis), it is pivotal to consider how the innovations discussed in Section 2.3 can converge with the pedagogical theories presented in Section 2.1 and the subject content presented in Section 2.2, since the integration of new technologies in schools carries new challenges.

As stated previously, to succeed in teaching with any ICT application, teachers are constantly asked to structure their classes to better suit the students, hoping to ensure optimal learning outcomes from the innovative procedures, when faced with the dynamic reality of today's society. To help understand and navigate through this ICT integration conundrum, Mishra and Koehler (2006) designed the TPACK

framework (see Figure 2.2) to help educators understand and apply subject content, pedagogical strategies, and technology in meaningful ways, and how to strengthen the relationships between them. Such understanding can help successful implementation of ICT in contemporary schools. The TPACK framework constitutes an effective basis for understanding teaching subject-specific content (critical reading in the case of this study) while using technology and appropriate pedagogies.

Figure 2.2

The TPACK Framework: Three Types of "Base" Knowledge of the TPACK Model



Note. From "What Is Technological Pedagogical Content Knowledge?" by M. Koehler and P. Mishra, 2009, *Contemporary Issues in Technology and Teacher Education*, *9*(1), Figure 1 (https://citejournal.org/volume-9/issue-1-09/general/what-is-technological-pedagogicalcontent-knowledge). CC BY-NC. Reproduced by permission of the publisher, © 2012 by tpack.org

The TPACK teaching pedagogical model involves the need to interrelate four key elements or knowledge types, as the model itself calls them, to ensure quality teaching in the 21st century (Mishra, 2019). The four knowledge areas are context, discipline content, pedagogy and instructional strategies, and technology. Since technology is a new component to teaching, it implies a change in the teaching profession, further moving teachers away from master classes and bringing them closer to a role of guide or facilitator in the learning process (Collins & Halverson, 2018).

The perceived changed role expects teachers to be capable of deploying appropriate educational strategies aligned with current practices (Rosenberg & Koehler, 2015). Confronted with this situation, Mishra and Koehler (2006) suggest that teachers should not only acquire proficiency in using technologies but also cultivate the essential skills to adapt continually to changes brought about by new software and hardware. The latter ability is important, as it highlights the speed by which technology loses its relevance today, when new technology arises.

To improve student learning by effectively interrelating the four knowledge areas by applying the TPACK framework, teachers need to be equally prepared in the basic knowledge areas, which Mishra and Koehler (2006) and Mishra (2019) classify and code as follows:

- contextual knowledge (XK)
- disciplinary or content knowledge (CK)
- pedagogical knowledge (PK)
- technological knowledge (TK)

As shown in Figure 2.2, the intersection of the three base knowledge areas creates three more types of knowledge. Mishra and Koehler (2006) refer to these knowledge intersection areas as pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical knowledge (TPK). The last interrelationship, technological pedagogical content knowledge (TPACK), is the result of the complete intersection of all these knowledge types. Baran et al. (2011) state that TPACK provides the aspirational concept where all seven components come together harmoniously.

2.4.1 The Core Knowledges

Contextual knowledge or XK refers to the understanding that teachers have about the context in which the teaching and learning occurs (Mishra, 2019; Mishra & Koehler, 2006). XK therefore contemplates the whole context, including the political, economic, and social stakeholders and how all of them interrelate, constituting a context that is inherently intricate. In this study, the context was described in Section 1.7, determined as Bogotá city.

Content knowledge or CK refers to the understanding that teachers have about the disciplinary subject to be learned or taught (Mishra & Koehler, 2006). It also refers to the traditional subject content knowledge imparted to preservice teachers, necessary for them to have a deep knowledge about a specialised subject or discipline. A depth of discipline content knowledge helps teachers to accurately teach, scaffold, and accommodate classes to suit the needs of the students according to their capacities and curriculum (Koehler et al., 2013).

In this study, the CK is critical reading in Spanish language. Like critical reading in English language, it has structure, grammar, phonology, morphology, and several dialectal variations according to different contexts. Critical reading is nested within reading competence under the epistemological, pedagogical, and curricular orientations that the National MOE of Colombia defines with the support of the educational academic community. These support the planning of the mandatory and fundamental areas defined by the General Law of Education (Ley 115, 1994), commonly referred as the Colombian lineaments. According to the lineaments, teachers' main goal is to help students understand and interpret texts, considering the functioning of the language in communication situations, the use of reading strategies, and the role of the interlocutor and the context. To do so, Colombian teachers should have deep understanding of the different aspects of the three reading dimensions discussed in Section 2.2.2 on reading and critical reading, and the semantic, syntactic, and pragmatic competences of the students (MEN, 2017); they should also be able to recognise appropriate places to provide support to scaffold and help learners develop meaningful learning.

Pedagogical knowledge or PK refers to having a deep knowledge of teaching strategies and learning processes and how students learn. It involves knowledge of how these processes should be organised so that it is as optimal as possible (Koehler & Mishra, 2009). Teachers' PK is relevant because qualified teachers are expected to know how to create an engaging learning experience that can develop the full potential of the students (Guerriero, 2017). These processes and activities are independent from the CK and include strategies towards motivating students, communicating with students and parents, and presenting and socialising information in the classroom. Strategies like flipped classroom, communicative learning, and GBL may be considered to support the pedagogy. As discussed earlier, the constructivist approach to learning recognises that a teacher is an independent person who, when faced with

daily teaching problems, is able to create new strategies and build their own pedagogical workspace in harmony with the complex contextual restrictions that only the teacher can assume and resolve daily (Brand & Moore, 2011).

Technological knowledge or TK is related to the control of existing technologies as teaching and learning tools. Koehler et al. (2013) define TK as ordinary technologies, including the traditional books and blackboard, and more advanced technologies, such as the Internet and digital games. TK encompasses not only technical skills related to technological tools but also a broader understanding that enables its application in both professional and personal contexts (Harris et al., 2009). Given the ongoing changes resulting from the features of technology's evolution, TK must remain adaptable and updated, facilitating teachers to continuously adapt their pedagogical designs to new technology developments (Koehler & Mishra, 2009; Koehler et al., 2011)

Mindful of the evolving nature of technologies, with time, the technological training of teachers has to regularly be adjusted. At first, the aim of preservice teacher training plans and courses was focused on the manipulation of current hardware and software tools (Mishra & Koehler, 2006). This instrumental vision of technology left aside the potential for innovative educational processes with ICT, hoping that the technical knowledge would lead to a pedagogical use of technology (Baran et al., 2011). Considering the massive innovations in technology since the TPACK model was initially designed, the training of preservice teachers and retraining of in-service teachers intends to teach them not only how to use the existing technological tools as part of their curricular design, but also how to continuously update their knowledge to be current with the latest teaching and learning technologies.

2.4.2 Intersections Between the Different Types of Knowledge of the TPACK Model

The above three knowledge skills do not always integrate perfectly, as anticipated in the TPACK model; noted as intersecting areas in Figure 2.2, the skills may integrate differently between one or two of the other knowledge areas only. In the same way that CK, PK, and TK are important, so are the new areas that result from their blend (Herring et al., 2016). Understanding these intersections helps explain the development pathways of teachers learning to integrate technology in their everyday

classroom practices. Thus, as noted earlier, the following additional categories can be distinguished: PCK, TCK, and TPK.

As shown in Figure 2.2, PCK implies integrating the best-suited pedagogical strategies for various aspects of specific content, in this case, teaching Spanish language critical reading. PCK entails surpassing the mere isolated understanding of the disciplinary content to be taught and extending beyond general knowledge about pedagogy, transcending traditional teacher training focused solely on content (Harris et al., 2009). PCK requires choosing the necessary teaching strategies and related materials and subsequently reworking the knowledge towards its delivery to help students construct personal meanings (Harris et al., 2009; Koehler & Mishra, 2009). To achieve learning, PCK indicates that teachers have knowledge and experience of relevant aspects of an adequate educational practice, such as understanding of students' previous knowledge, awareness of the most common conceptual errors made by students and ways to correct them, and finally, use of different teaching strategies to explain the same content.

For example, Johansson and Myrberg (2019) and Myrberg et al. (2019) report that teacher specialisation is positively linked to student achievement, due in part to the specialised teachers' effective teaching practices. To obtain these results, their research team conducted a two-level regression study using Swedish data from the 2011 National Extension Progress in International Reading Literacy Study, a fourth-grader reading assessment. In this assessment, teachers were asked about their level of specialisation in teaching Swedish language in fourth grade by means of six questions,[1] whose analyses were later separated into two categories: (a) general fourth-grade knowledge, and (b) special training to teach Swedish language in fourth grade. The latter group specialised in CK and had acquired and developed special PK that made their PCK better suited to improving their students' language learning. A second example of PCK is the qualitative research of Shanahan and Tochelli (2014) involving nine elementary reading teachers. The authors interviewed the teachers individually and in groups about their approaches to PCK after the teachers reviewed videos of themselves in class settings. Through the use of video study groups and artefacts,

[1] The six questions covered the following information: (1) type of teacher education, (2) emphasis on reading pedagogy, (3) preparation in teaching reading comprehension as a part of teacher education, (4) emphasis on Swedish language, (5) number of semesters studying Swedish language, and (6) focus on primary school years during initial training (Myrberg et al., 2019).

teachers had the opportunity to verbalise their understandings and misunderstandings of the PCK of their peers as much as their own, learning alternative strategies to their repertoire of teaching content through socialisation.

One of the teaching strategies that can be empowered through using ICT tools is the co-construction of knowledge, as previously discussed in Section 2.1. For example, research by Cordero et al. (2018) involved 51 children in third grade at a middle-class public school in San José, Costa Rica. The students received tablets as part of an experiment in the co-construction of reading and writing knowledge in Spanish language. During phase one of the experiment, students read four short texts totalling 259 words accompanied by illustrations that had movable digital objects which needed to be used in a correct way to progress from one text to the next. This process was described by the authors as part of the co-creation of knowledge, as it depended on the narrative of the story, for the objects selected were used in the next phase. In phase two, the student was tasked with the creation of a picture based on the text where the objects from phase one could be used. In phase three, the students typed a story for what they drew in phase two, co-constructing their own original stories, a mix between the read text in phase one and their imagination, context, and opinions. The thematic analysis of the written documents showed that 25.6% of the students retold the stories, whereas the remaining 74.4% created new content.

TPK is the combination of teachers' pedagogical and technological expertise. This encompasses an understanding of the pedagogical possibilities and the strengths and limitations of various technological tools intended for specific subject learning contexts (Koehler & Mishra, 2009). TPK illustrates the scenario where technologies possess unique affordances and understanding, influencing their potential use with diverse pedagogical approaches to meet teaching and learning needs. Mishra et al. (2011) argue that that a thoughtful consideration of how teaching processes are altered with the integration of ICT is essential. Developing TPK skills requires teachers to cultivate abilities beyond technology, encompassing the creative adaptation of ICT tools for effective classroom use.

A frequent challenge in reaching this intersection lies in the non-educational nature of many available software programs and the neglect of potential ICT applications in teacher training curricula. Overcoming these hurdles necessitates a preliminary examination of various software options to assess their potential in

facilitating teaching and learning strategies (Koehler et al., 2011). Therefore, the implementation and analysis of the TPACK model in tertiary and specialisation studies is a fundamental component for planning the effective training of future teachers in understanding and using current ICT tools. In this sense, Hofer and Grandgenett (2012) discuss the possibilities of the TPACK model to respond to the fast speed of the modern world, stating that universities should not complete teacher training programs without having trainees participate in a subject that provides each teacher with the technological knowledge they need to effectively engage the students they are intended to teach.

Examples of how TPK is used are provided in the previously discussed research by Jiménez Porta and Diez-Martínez Day (2018), who established how non-commercial video games like Minecraft: Education Edition could be used to modify and enhance the pedagogical possibilities for teaching literacy in Spanish language, while acknowledging that there may be some limitations to its use. On the other hand, the delivery of the pedagogical content can also be taken in account, as it provides a change in how educators design and articulate their classes. For instance, Blackwell et al. (2016) used an online survey to investigated how TPACK contextual factors influenced 411 preschool teachers to use tablets, after acknowledging how these hardware had become common in their classrooms. Their results indicate a positive view of the sampled teachers towards the use of tablets and highlight the importance for both policymakers and school professionals to value the attitudes of in-service teachers towards technology as a pivotal part of the integration of technology in classrooms. Blackwell et al. advocate that teachers' attitudes should be considered at the same level of importance as funding for hardware, software, and infrastructure.

TCK refers to the knowledge needed to understand how technology and content influence each other, and thus, assumes that the teacher must be aware of the strengths and limitations of the use of ICT for teaching specific content (Herring et al., 2016; Koehler & Mishra, 2009). Similarly, decisions regarding the concepts to be conveyed constrain the types of technologies suitable for achieving them. Thus, aside from mastering the subject matter they teach, teachers should also possess a profound understanding of how their discipline can be transformed or enhanced through the integration of ICT tools.

Just like TPK, where recognising technology and pedagogical convergence points is pivotal, in TCK teachers and instructors need to understand what specific ICT

tools are appropriate to be used towards specific content, and how curricular content changes technology and vice versa (Koehler et al., 2013). An example of this scenario is how an online course about ICT tool Google Earth was created for the understanding of geography by preservice primary teachers. This study by Gómez Trigueros (2016) reports on the CK difficulties of some teachers in understanding geographic space, spatial perception, and maps and map scales to contextualise their social studies teachings about Spanish national history, which in turn hindered their ability to transmit correctly this needed subject. The author then chose an ICT tool like Google Earth, which allowed teachers to see an interactive approximation of the real scales of maps, towards improving their knowledge, which led to the creation of an online course on Google Earth to have preservice teachers learn how this ICT tool could change the way their classes were conducted. Another example is a case study by Gromik (2012) on the use of mobile phone video-recording capacities as a language learning tool. In this research, the participants made weekly videos of themselves and indicated how the use of this ICT tool improved their second-language vocabulary. Lastly, both authors emphasise an argument already established in the discussion of my research project and that is closely related to its objectives: due to technological advances, educators need to understand the benefits and challenges of integrating ICT tools (mobile phone devices in this example) as learning instruments in their practice.

2.4.3 So, What Is the Fuzz Around TPACK? Pros and Cons of the Model

As discussed above, the TPACK framework permits (a) teachers to discover their level of understanding of the different foundations that make up their training options and teaching/learning strategies (Price et al., 2014; Tai, 2013) and (b) preservice education programs to consider how best to include technology in their curricula to prepare the next generation of teachers. Consequently, TPACK is presented as a model that can help solve and avoid conflicts by improving in-service teachers' opinions about ICT, as well as helping both preservice and in-service teachers learn how to use ICT tools through upgrading the current curricula or by specialisation courses or retraining activities. Likewise, the TPACK model proposes a reflective action when approaching the teaching work, as it also facilitates the analysis of teacher training by making preservice teachers participants in their own learning development.

The TPACK model also proposes contextualised teaching and learning lessons, as teachers apply a specific pedagogical and methodological approach to their classes with a particular ICT, regardless of the grade with which they are teaching. In this latter approach, the introduction of ICT does not provide the expected results, with little or no achievement of the initial goals designed (Jang & Tsai, 2013). The TPACK model provides a solution to this problem, since it builds in observation and analysis of the learning needs of a group of specific students regarding a specific disciplinary content. The instruction and learning proposals produced from such thinking and planning will be carried out in authentic contexts, and the results obtained will have a better chance of coinciding with the planned objectives (Mishra & Koehler, 2006; Niess, 2011).

Several English-written articles discuss the use of the TPACK framework in regard to language learning and teaching, and more research is being added on the subject continuously (Tseng et al., 2020). Among them, the study by Abu-Hardan et al. (2019) argues how TPACK served to improve the EFL reading skills of struggling tenth-grade students and that further studies are needed to understand the real benefits of the framework in different language education settings. To achieve these results, the research team developed a pretest/posttest experiment that comprised questions covering reading skills included in tenth-grade English textbooks like decoding, vocabulary, and comprehension. Both tests were administered to 66 tenth-grade students, with half of them receiving a traditional set of lectures, being the control group, and the remaining half receiving lectures involving ICT tools such as animations, graphics, video, and audio resources. Other uses of the TPACK framework are addressed in research like that of Mei et al. (2017), where the framework is a tool to identify the factors influencing preservice EFL teachers in the People's Republic of China to use computer-assisted language learning (CALL). According to their research, it is common to find Chinese EFL teachers reluctant to use ICT in their classrooms, even if the needed infrastructure is available and after the Chinese government has named ICT teaching as being of strategic significance. Nevertheless, Mei et al. also report a positive influence towards CALL thanks to TPACK, since its use has made preservice teachers aware of the importance of the knowledges and how they need to go beyond personal proficiency with English language and the basic pedagogy, needing to improve their TK, TCK, and TPK, especially when taking into account the tools that ICT brings to the language classroom.

Contrastingly, in the TPACK framework, technology is not positioned as the primary driver of teaching activities; rather, it is considered as another component within the educational environment shaped by the teacher and the context. This perspective moves away from the notion of prioritizing ICT and exploring its possibilities, shifting towards reflecting on the learning needs of students and how a ICT tool can be integrated into that context (Koehler et al., 2011). The emphasis lies on the instructional process involving technologies, not just on incorporating ICT into the teaching of specific disciplinary content. As some authors indicate, adopting a holistic TPACK approach to context, disciplinary, pedagogy, and technology content encourages a critical outlook and leads to a more profound comprehension of these processes while fostering positive adjustments for teaching nowadays (Evrim & Erdem, 2016; Herring et al., 2016; Swallow & Olofson, 2017).

Nevertheless, a whole body of theory has been developed that highlights some questionable aspects of the TPACK model. Koehler et al. (2011) argue that the model influences the characteristics of teacher knowledge by presenting a theoretical basis, but perhaps fails to provide key points in which future teachers need to excel for a full achievement of the integration and the subsequent teaching/learning processes. Another possible limitation is that the TPACK framework is founded on ICT as a teaching tool when, in reality, most technologies used in school settings were not designed thinking of teaching or for education. Because of this, teachers need to undertake the additional task of adapting and repurposing tools to suit their needs in educational settings (Koehler et al., 2011) until commercial and educational tools are directly designed to complement PCK and the curricula. In this sense, the TPACK model proposes that teachers become designer agents of pedagogical experiences that use the ICT tools on top of being teachers, consumers, or technology users (Olofson et al., 2016).

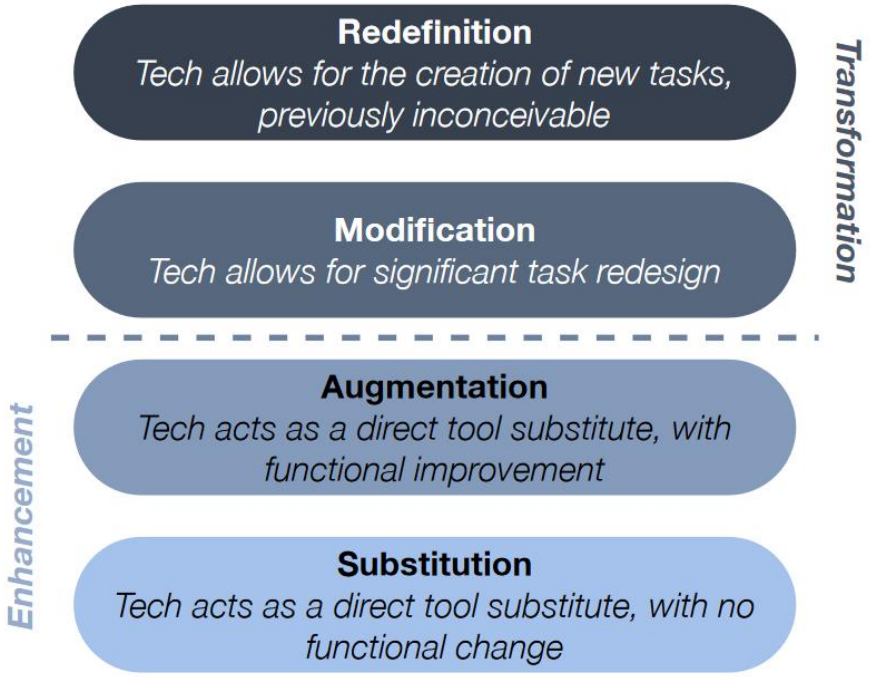
As TPACK is a model developed around technology and given the speed with which ICT tools become obsolete, a conflict can arise, for even when teachers feel capable of using a specific ICT tool in which they have specialised, the same expertise will not exist with older and future technologies, leading to the subsequent abandonment of ICT for instruction. Nevertheless, the model itself implies that TCK and TK are not based upon a single tool, but rather are a way of understanding how the tools available should be used in any given time (Koehler et al., 2011).

2.5 SAMR

The SAMR model is a secondary educational framework that focuses on the integration of technology in the classroom. It was developed as a hierarchical framework to categorise and evaluate the extent to which technology is used in education (Puentedura, 2006). SAMR stands for substitution, augmentation, modification, and redefinition, and it provides a progressive model of how technology can be integrated into teaching and learning in four levels, as seen in Figure 2.3.

Figure 2.3

The SAMR Model



Note. From *SAMR and TPCK: Intro to advanced practice* (p. 3), by R. Puentedura, 2010, Hippasus (http://hippasus.com/resources/sweden2010/SAMR_TPCK_IntroToAdvancedPractice.pdf). CC BY-NC-SA. (Puentedura, 2010).

Substitution: At the lowest level of the SAMR model, technology is used as a direct substitute for a traditional classroom tool or process without any functional change – for example, using a word processor instead of a typewriter or using a digital textbook instead of a printed one. In this stage, technology merely enhances the task but does not fundamentally change it.

Augmentation: In the augmentation stage, technology provides a functional improvement over traditional teacher-centred teaching methods. It enhances the task in some way, such as providing spellcheck in a word processor or allowing students to access additional information through hyperlinks in a digital textbook. While this integration creates an improvement, the core learning remains the same.

Modification: The modification stage involves using technology to redesign and significantly modify the learning strategies. It allows for tasks that were previously inconceivable without the integration of ICT tools. For example, students might collaborate in real time on a document using cloud-based tools or various computers linked to a screen, which is quite challenging to achieve without using ICT tools designed for co-working scenarios. This stage represents a substantial shift in how the task is accomplished.

Redefinition: At the highest level of the SAMR model, ICT integration leads to the creation of new tasks that were previously inconceivable, which transforms the learning experience fundamentally. For example, students might engage in global collaborative projects, conduct real-time data analysis, or create multimedia presentations with interactive elements. At the redefinition stage, ICT tools not only enhance but also redefine the learning process.

The SAMR model is often represented as a ladder with substitution and augmentation at the lower levels and modification and redefinition at the higher levels, as shown in Figure 2.3. The goal for educators is to strive for higher levels of technology integration, where technology transforms teaching and learning rather than just enhancing or substituting for traditional methods.

The integration of the TPACK framework and the SAMR model forms a dynamic approach to enhance understanding about technology integration in pedagogical practices. The SAMR model complements the development of TPACK competence among teachers and education policymakers. It encourages them to craft rich tasks that reimagine traditional learning methods, thereby creating opportunities that were previously inaccessible without the integration of ICT tools into learning strategies, using technology to transform and enrich the learning experience (Kirkland, 2014).

The role of ICT in language pedagogy goes beyond serving as a mere instrument, like a blackboard or pencil and paper, by providing authentic material access and

facilitating worldwide communication (Alivi, 2019). Hence, language teachers are encouraged to integrate ICT, particularly through the lens of TPACK, by progressing through the SAMR levels (Puentedura, 2010). This involves introducing students to various technologies, initially using them as substitution tools, and gradually advancing to augmentation tasks. As students become more familiar with ICT, teachers can incorporate technology into higher level tasks, encouraging creativity and extensive language practice.

In conclusion, while the SAMR framework offers valuable guidance for technology integration, it predominantly focuses on technology and pedagogy, with limited reference to context (XK) and content (CK). To create a more holistic understanding of how technology supports content-based teaching by recognising the importance of XK and CK, the TPACK framework comes into play. By considering the interplay of TK, PK, and CK, teachers can navigate the details of technology integration in diverse educational settings and using diverse pedagogical strategies. The integration of the TPACK and SAMR frameworks aims to guide teachers in the effective integration of ICT, offering learners opportunities for active and social learning. The TPACK and SAMR frameworks have been used together in research providing results about the importance of professional development, infrastructure, and work policies (Pacheco & López, 2018). However, it is essential to recognise that technology is not a mandatory requirement for every educational activity. It should be employed as a tool to enhance and assist in learning, but it does not inherently determine the effectiveness of a learning activity. Success in teaching and learning depends on aligning instructional methods, whether technology-based or not, with students' needs.

2.6 Summary

Due to social, economic, and technologic changes, teaching has been forced to evolve. This literature review has highlighted how contemporary instructional practices are best suited for contemporary teaching when content-driven, pedagogically wise, and technologically forward-thinking knowledge meet in the classroom, as provided by the TPACK framework (Mishra & Koehler, 2006). The review also delved into language acquisition and reading comprehension, exploring various perspectives and introducing the concept of critical reading. In the Colombian education context, teaching critical reading is vital, and teachers are encouraged to

employ pedagogical strategies that connect new information with prior knowledge. Furthermore, equipping teachers with knowledge about digital tools is essential to enhance their teaching methods and improve students' reading outcomes. The literature review also touched upon the transformation of education over the last two decades, driven by advances in ICT. It highlighted the challenges of ensuring equitable access to technology and the emergence of pedagogical approaches like online learning, blended learning, and DGBL to enhance the educational experience. Once the pedagogical scenario is set and the content prepared, the integration of ICT tools allows teachers to create learning spaces where students can use their abilities and past knowledge to achieve critical reading.

The chapter also discussed the convergence of pedagogy, content, and technology through the TPACK framework to address the integration of ICT in secondary school language teaching. The TPACK model emphasises the need for teachers to blend discipline content, pedagogical strategies, and technology application effectively. It underscores the evolving role of teachers as guides rather than lecturers in the face of technological advancements. The chapter also explored the benefits and challenges of the TPACK model, highlighting its potential to enhance teaching practices, while acknowledging the need for ongoing professional development and adaptation to changing technologies. Additionally, it introduced the SAMR model as a complementary framework that guides the progressive integration of technology into teaching, ultimately transforming the learning experience. This combined TPACK and SAMR approach aims to enrich language pedagogy by harnessing the power of technology while considering contextual and content-specific factors, as well as emphasising the need for ongoing professional development and adaptability to changing technologies. Thus, following the TPACK framework, the correct development of a competent teacher in the use of technology in the classroom would not be determined by the available resources, but rather by a correct educational use of technology and would go through the mastery of three types of knowledge: technological (TK), pedagogical (PK), and content (CK). Therefore, this research uses the TPACK model to investigate the capability of secondary school teachers in the three core knowledge domains and how they use such capacity to support ICT integration to teach Spanish critical literacy. The next chapter discusses the proposed methodology to support the research investigation.

Chapter 3: Methodology

The previous chapter synthesised the existing literature related to this research, providing an understanding of how teachers engage with and embrace ICT and innovative pedagogical practices to teach languages in schools. The literature drew on experiences both worldwide and in the local context of Bogotá DC. In this third chapter, the methodology and research design implemented for the empirical phase of this qualitative exploratory case study are presented. The structure of this methodology chapter is as follows: Section 3.1 begins with a brief initial overview of the research design, while Section 3.2 introduces the research approach, commencing with an overview of the theoretical framework, followed by an explanation of the case study method and the triangulation techniques employed in addressing the research objectives. In Section 3.3, the sample and research site are discussed. Section 3.4 covers the data collection, including the instruments and protocols used, and is followed by Section 3.5, where the data analysis processes are examined. The final two sections summarise the research rigour and the ethical approach.

3.1 Research Design Overview

As discussed in Chapter 1, the purpose of this study is to investigate the integration of ICT tools by secondary school literacy teachers towards achieving critical reading in selected private schools of Bogotá DC, the capital city of Colombia. A key research question was identified to address this research objective:

> *How do Spanish literacy teachers integrate ICT to teach critical reading in private secondary school settings of Bogotá DC?*

The research question aims to investigate Spanish literacy teachers' knowledge of Spanish language critical reading content (CK), how to teach it in the selected context and population (PCK), the general use of ICT in supporting literacy teaching (TPK), and finally how all three are integrated as new ICT competency to teach critical reading in secondary school (TPACK) in Bogotá's schools (XK). The three knowledge domains are bounded under the TPACK framework discussed in the literature review, which provides a theoretical framework to investigate and understand how these knowledge and skills are integrated towards making teaching more meaningful and

successful for students. Consequently, to understand how the knowledge and integration are currently present in Bogotá's schools, I interviewed a sample of nine teachers who have relevant teaching experience and have used ICT tools towards teaching critical reading, and reviewed documents produced by the teachers, using a qualitative single case study method.

Therefore, two datasets were collected from every teacher: first, interviews to learn about their views and strategies for teaching critical reading using ICT tools, and second, documents or artefacts to examine how the responses provided in the interviews presented themselves in the artefacts designed by the teachers (guides, lesson plans, presentations, and/or assessments), which they used during their classes. Both datasets were transcribed and translated, then imported to NVivo Windows Release 1, a qualitative data analysis software to help organise, manage, code, and analyse the data. Interviews and documents were coded separately, then each data item was analysed and compared, not only interview-to-interview but document-to-document and interview-to-document, thus allowing for triangulation of the data and deep analysis of teachers' perceptions and their actual level of integration of ICT.

3.2 The Research Approach

The proposed research is a qualitative exploratory case study aiming to investigate why and how Spanish literacy teachers working in secondary schools in Bogotá DC are currently using ICT to develop critical literacy competencies of secondary school students. To accomplish this aim, an exploratory qualitative approach was chosen, since it allowed for an in-depth investigation of the opinions and motivations (Stieler-Hunt & Jones, 2015) of teachers regarding use of ICT to teach Spanish language/critical reading. A well-designed and carefully conducted qualitative approach allows research on the context as a whole: society, administrators, and policymakers (Mills, 2010). Therefore, to develop a holistic understanding of ICT use in Spanish critical literacy learning, what happens in the classroom school environment needs to be understood within the influence of both internal and external factors impacting on the classroom practices. This holistic understanding is necessary for this study given the complexity of the education sector, where teachers are often blamed even though the cause of the problem may lie outside the classroom, such as with teacher training programs or governmental policies,

but a qualitative approach also builds towards the understanding of the perceptions inside the classroom (Koch et al., 2014).

3.2.1 Qualitative Research – What, Why, How

Supporters of the qualitative method consider that qualitative research is an interpretive process of inquiry, based on different methodological traditions. Its main strength is how it allows the examiner to build a complex, holistic picture filled with deep analysis of the perspectives of the different interacting agents. Its purpose is to generate knowledge by using any of several approaches, methods, and techniques, such as content and discourses, phonological and archival analysis, and even descriptive statistics and numbers (Creswell & Creswell, 2017). Qualitative research builds knowledge from methodological traditions that are particularly relevant to examining a human or social problem, such as biography, ethnography, or case studies (Denzin & Lincoln, 2011; Jenner et al., 2004).

Furthermore, this approach allows the research to attain an in-depth understanding of phenomena from the viewpoint of the participants and provide insights into the research subject's world and the importance of their perceptions in identifying concerns and reasons (Bloomberg & Volpe, 2016). It is a decisive methodology for understanding thanks to the flexibility, creativity, and provisional nature of its procedures and results. The qualitative approach allows an interpretation of social reality where direct contact with the subjects prevails, through the nature of their own thinking and their perceptions, unlike quantitative studies, where the phenomenon is interpreted through preconstructed questions and numerical data. But qualitative research is also defined by its possibility of deepening and diversifying knowledge about what people think, feel, and believe, deep elements that underlie people's consciousness, aspects that are not usually obvious or accessible to instruments of numerical measurement. They are realities that cannot be collected and known in a concrete way, but must be interpreted or "elaborated" from the expressions, gestures, words, action, or inaction of the investigated subjects.

Qualitative research aims to describe and understand the reality it studies, but also its explanation, that is, to propose the "why" of the observed facts: This explanation implies the proposal of ideas that systemically integrate the knowledge of the context studied (Bloomberg & Volpe, 2018). The discourses are interpreted by the

researcher, who, according to the theoretical frameworks they assume and the social contexts they define, proposes an explanation of the observed data or facts. In consequence, the appropriateness of a qualitative method rather than a quantitative method for this study is based first on how the sample size of a qualitative study is not grounded on the measurements of a large sample, but instead uses a reduced sample that allows the researcher to attain more detailed information and gain a greater understanding of the reality under research. Second, open-ended questions rather than closed-ended questions will permit the participants to share their experiences and feelings without giving closed responses based on a theory.

Reviewing the integrity offered by a qualitative approach implies delving into the psychological perception of the sampled participants from a privileged place in order to subsequently be able to analyse all the impressions and give this research different yet complementary points of view to promote a more complete end result. In this case, it will allow me as the researcher to understand the beliefs and ideas behind the use of ICT by the Spanish language teachers in the selected schools and to analyse their readiness to use new technological tools by means of the TPACK framework (Bustamante, 2020; Voogt & McKenney, 2017) and the SAMR model (Blundell et al., 2022).

3.2.2 Case Study Design – What Is It, Why Use It?

As noted in the above section, qualitative studies can be complex, and thus researchers need tools and protocols to ensure manageability. To ensure achievable research outcomes, a case study design is often considered an appropriate path to partition sections of the phenomenon being researched to allow deeper understanding and to avoid being distracted by issues less critical to the phenomenon researched.

A case study is an empirical research method employed to explore a specific and confined phenomenon, referred to as *the case*, within its contextual setting and in a comprehensive manner (Yin, 2018). Given the complex and diverse education system in Bogotá DC, a single study cannot capture all issues related to teaching and learning of Spanish language in the country. Thus, a case study is used to understand the case in its natural contextual conditions as opposed to in a laboratory. A *case* is a smaller unit of a larger system (in this case, selected schools of Bogotá as a subset of the overall city's education system) that studies the interaction between multiple variables using several measures (Flick, 2014). Several authors note that the case study is one of the

most used strategies in social research, especially if it is intended to answer questions related to "why", "how", "what", or "where" (Yin, 2015). Consequently, since the research question is *How do Spanish literacy teachers integrate ICT to teach critical reading in private secondary school settings of Bogotá DC?*, applying the case study method will help place boundaries on the case, ensuring the research answers the research question.

In addition, it is useful to use the case study method if you have low or no control over the context while the inquiries are directed to a contemporary phenomenon that is related to a real-life context, as with the present investigation, where the curriculum, students, and available technology are not within the control of the research team. Case study research involves generating analytical rather than statistical understanding and applications (Flick, 2014), an approach that will work to understand the integration of ICT and education in secondary school critical reading courses in Bogotá. To maintain the study focus, use of TPACK as a framework to analyse how teachers are using ICT helps avoid distractions and thus advances the understanding of the strengths and weaknesses of the current system (Creswell, 2014). Another virtue of case study research is that it allows an in-depth study of the phenomenon from many perspectives, and not only from the influence of a single variable, by employing a specific analysis on a particular population (Yin, 2014). It allows the research to engage with all stakeholders within the case boundary, such as teachers, students, policymakers, teacher educators, and parents. Accordingly, the case selected for this study is a sample of experienced teachers currently working in private secondary schools, who have practice using ICT as part of their delivery of content for Spanish language courses from Grade 6 to Grade 11, bounded by the jurisdiction of Bogotá's Secretary of Education as well as by the schools that have access to ICT equipment. Since all the teachers work in similar IB schools, and to support the exploratory nature of this thesis, a single case study is preferred over a multiple-case study, to delve deeply into this specific case.

3.3 The Sample

It has been argued that for a qualitative study it is important to select a number of participants who are able and willing to provide in-depth understandings of the research phenomena over a sample based on a statistical formula (Gentles et al., 2015;

Yin, 2014). Therefore, this qualitative study employed convenience sampling, a non-probabilistic sampling technique, due to its practical benefits of accessibility, availability, and feasibility (Schreier, 2018). It is important to note that convenience sampling has its limitations, including a higher likelihood of self-selection bias, which can have an impact on the influence of outliers on the results (Etikan et al., 2016). However, given the constraints of limited funding and a tight project timeline, convenience sampling was deemed suitable for this study. The study sought to gather in-depth insights into the experiences and perspectives of teachers who met specific criteria to ensure that the research questions were effectively addressed. In this research, the sample consisted of nine Spanish literacy teachers in secondary education level in Bogotá who fulfilled the following specific selection criteria related to their employment, teaching experience, and use of ICT:

1. Participants needed to either currently be employed as Spanish literacy teachers in secondary school level in Bogotá or have been in the last 2 years.
2. Participants needed to have 5 years of experience or more in teaching Spanish literacy classes at secondary education level.
3. Participants needed to demonstrate using ICT to deliver Spanish literacy and/or critical reading courses.

The first criterion ensured that the participants had recent or current experience teaching Spanish literacy in the targeted educational context. The second criterion aimed to include experienced teachers who could provide valuable insights into the use of ICT in teaching Spanish literacy. The third criterion ensured that the participants had experience integrating ICT tools and resources into their teaching practices. By selecting participants who fulfilled these criteria, the study aimed to capture a diverse range of experiences and perspectives related to the use of ICT in teaching Spanish literacy in Bogotá from persons whose experience was relevant.

Following these criteria, I contacted International Baccalaureate (IB) schools. IB schools provide internationally recognised education for students with a curriculum focusing on holistic development, aiming to foster intellectual, personal, emotional, and social growth in students. IB schools are known for their rigorous academic standards and emphasis on research and writing skills. IB programs provide a rigorous and inquiry-based approach to learning, emphasising critical thinking, intercultural understanding, and a global perspective, which grants them certain advantages over

less privileged schools. IB schools have the autonomy and funds to selectively hire highly qualified teachers, distinguishing them from other educational institutions, including publicly funded schools and private non-IB institutions (Gardner-McTaggart, 2016). The recruitment process involved sending an email invitation to multiple principals from various schools in Bogotá. These principals then provided the contact details and best times for me to liaise directly with all the Spanish Language teachers in each institution, teaching at secondary education level.

In this study, the selection protocol involved identifying and selecting individuals or groups who were particularly well informed and experienced with the established research interest (Creswell, 2014) the application of ICT for teaching and learning critical reading in Spanish language – and who were willing to participate, collaborate, and communicate their experiences and opinions in a reflexive manner through semi-structured interviews and sharing artefacts. The data collection instruments will be discussed further in the next section.

3.4 Data Collection Instruments

Acknowledging that data collection is essential to gather relevant and detailed information on the process, situations, and experiences of the research participants, a researcher relies on various qualitative techniques and instruments that allow for systematic, credible, and accurate qualitative data collection (Salmons, 2014). Among the most widely used are in-depth interviews and document analysis, techniques that give rise to collecting data in a detailed, organised, and thorough way while procuring the appropriate data types and volumes. While a large amount of data may be necessary for qualitative studies, the small details that make the difference in a qualitative investigation within this enormous amount of information can be overwhelming. Therefore, careful consideration of the correct selection of type of data required and the most appropriate techniques or phases is essential, since qualitative research cannot be reduced to specific techniques, nor to a succession of stages, but rather consists of a dynamic process that unites problems, theories, and methods (Ritchie et al., 1994).

As outlined in Section 3.1, a two-pronged approach was employed for this study, using interviews and artefacts. However, due to the COVID-19 pandemic between 2020 and 2022, the data were collected online, following a protocol that led to conducting online interviews and collecting e-copies of artefacts.

3.4.1 Interviews

The interview is a technique that represents the qualitative approach in all its expression, and although it is often combined with other methods (Kvale & Brinkmann, 2018), its relevance and historic importance give the research dependability. For this research, semi-structured interviews were used, an open, flexible form of interview that allows for open-ended responses from participants for more in-depth information while encouraging two-way, face-to-face communication (Merriam & Tisdell, 2015). To prepare for the interviews, I wrote an interview protocol (see Appendix A) and a script of open-ended questions (see Table 3.1 in the following subsection) as a guide to obtain teachers' perceptions. Nevertheless, I also led the conversation to maintain the focus on the project's subject, asking new questions when considered appropriate and in the terms that seemed convenient, explaining their meaning, asking the interviewees to clarify something or that they delve into some aspect when necessary, while establishing a personal style in conversation (Kvale, 2011; Rubin & Rubin, 2011). The interview questions were translated into Spanish language, as it is the national language spoken in Bogotá and it helped me to make the interviewees more comfortable and have them discuss their ideas more easily.

The script of indicative semi-structured questions (see Table 3.1) focused on the teacher's activities, abilities, and background in connection to their Spanish language classes and their use of ICT for teaching Spanish language critical reading. The questions were written from emergent themes identified from the concepts and works explored in the literature review, like the questions by Schmidt et al. (2009) and de Haro Rodríguez et al. (2020) and translated to the Spanish language. Although data collected from open-ended interviews can be more difficult to analyse than closed-response interviews, participants can provide greater insights to the issues addressed, which might result in a more accurate reflection of their perspective; furthermore, open-response analysis helps limit researcher bias (Gentles et al., 2015; Kvale & Brinkmann, 2018).

The use of interviews paired with other data collection tools in case studies towards learning teachers' views and use of ICT and TPACK is widely recognised, with several authors having used these tools to develop research when attempting to correlate the intentions and beliefs of teachers with their actions in classrooms. Among them, Bustamante (2020) used interviews, classroom observations, and document analysis to explore the practices of 18 teachers of Spanish in Grades 7–12 in Nebraska

USA, who participated in a professional course designed towards improving their technology, pedagogy, and content-based knowledge. Bustamante found that the chosen teachers underwent positive and constructive learning experiences for technology, pedagogy, and content. In the documented research by Saudelli and Ciampa (2016), the use of interviews and classroom observations was paired with an educational blog kept by teachers and video recordings of lessons; The authors reported that the TPACK framework serves as a valuable tool for comprehending teachers' self-efficacy beliefs. Additionally, they asserted that it provides a mechanism for contemplating professional development courses related to the successful integration of technology for teaching strategies.

The challenges of COVID-19 required the use of online tools for the interviews, which may not prove as free-flowing as in a face-to-face situation; nevertheless, I aimed to make each interview as close to a regular interview as possible, despite the online approach.

Interview Protocol

Prior to conducting the interviews, it was important to develop a structure that would allow the interviews to be conducted in accordance with the objectives of the study. Therefore, it was necessary to standardise the activities to be carried out through a protocol, defined as a formal record designed by the researcher of the detailed sequences that contains instructions for the process of the interview, the main questions to be formulated, and space to take notes (Creswell, 2014). An interview protocol strengthens the corroboration of the research process and the consistency, authenticity, and possible transferability of the study (Patton, 2015). This protocol was validated by the supervisory team for its appropriateness for this research.

The following steps were used as the interview protocol for this research; these were based on the protocol laid out in the Queensland University of Technology (QUT) ethics application template.

1. I compiled a spreadsheet of private schools located in Bogotá DC, with public information such as the address, telephone number, and contact email of the principal. If the public contact information did not provide a contact email, I made a phone call to the school to find a contact person and their email.

2. I sent an information email to each principal (see Appendix B), attempting to either secure a call to explain the project further or request the contact data of teachers teaching critical reading in secondary school years. This email had the Participant Information Sheet (PIS) – Principal attached (see Appendix C) to provide the principal with all the relevant information.
3. I sent a recruitment email, PIS, and consent form to potential teacher-participants' emails secured during step 2 (see Appendices D, E, and F). This email provided the teacher with the necessary information about the study, their possible role in the project, and the selection criteria (as detailed in Section 3.3) through the PIS.
4. Emails from potential participants were collected until nine responses with the consent form signed were received.
5. One week before each interview, I sent an email reminding the participant of the time of the interview. Given the need for online communication, consideration was given to access to stable and high-quality internet connectivity for both parties, and a room code for a Zoom meeting was provided. At this stage, I reminded all participants that their participation in the study was voluntary and how they may withdraw at any stage of the process.
6. Before the interview in the Zoom room, I asked each participant verbally to confirm their willingness to participate in the research as per the signed consent form delivered previously, and provided them the opportunity to ask questions and have these answered. I also obtained their verbal permission to begin the audio recording.
7. I then started the recording of the interview using Zoom and conducted the interview.
8. During the interview, I asked each teacher to provide an artefact that we had discussed and to send it electronically in PDF format (so no changes could be made to it after receipt), together with an Image Release Consent Form – Artefacts (see Appendix G), to my QUT email address.
9. At the end of the interview, I thanked each participant for their time and for sharing their knowledge and experience. I also advised the participants of the member-checking process and that I would get back to them when the transcribing of the interview was completed.
10. After completion of the interview, I finalised the Zoom meeting.

11. After transcribing the interviews, I exported them into a PDF document and sent it via email to each interviewee for member checking, which involved them checking the veracity of the transcription and of the ideas written. A day later, I called each participant who had not replied with the document, reminding them of this crucial step.

Table 3.1 presents a sample of the script for the interview questions (in English), which are based on the TPACK self-assessment test by Schmidt et al. (2009) and Urbina et al. (2017).

Table 3.1

Script of Semi-Structured Interview Questions

No.	Question	Area of TPACK discussed
1	What ICT tools and devices do you use in your day-to-day life?	TK
2	What content do you usually teach in your Spanish language courses?	CK
3	Which non-technological methodologies for teaching do you use in your classes regularly?	PK
4	Can you please tell me about your views for using technology with your students?	TPK
5	Do you know software or tools specific to language education? If the answer is yes, please name the software you know and explain what can be done with that software? If the answer is no, is this a lack of professional knowledge? Is knowing such software a plus? Please, detail your answer.	PCK, TCK
6	What ICT tools and devices do you use in your Spanish language courses?	TCK
7	In what ways do you use any of these ICT tools and devices in your Spanish language instruction?	TPACK
8	How do your students respond to your use of technology in the classroom?	PCK
9	What are the current and potential barriers you face when using technology in the classroom?	TCK
10	What strategies do you use to overcome these barriers?	TPK
11	Do you consider that today's societies and technological changes are being delved into deeply enough by the Ministry of Education, the Secretary of Education, and other policymakers?	XK
12	How do you define computer-based language education? What is the meaning of this concept for you? Please, explain it.	TPACK
13	Do you feel that you are able to combine your use of pedagogy, content knowledge, and technological skills to effectively integrate technology?	TPACK
14	What does critical reading mean for you?	CK

Note. CK = content knowledge; ICT = information and communication technology; PCK = pedagogical content knowledge; PK = pedagogical knowledge; TCK = technological content knowledge; TK = technological knowledge; TPACK = technological pedagogical content knowledge; TPK = technological pedagogical knowledge; XK = contextual knowledge. Adapted from "Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers," by D. A. Schmidt, E. Baran, A. D. Thompson, P. Mishra, M. J. Koehler, and T. S. Shin, 2009, *Journal of Research on Technology in Education*, *42*(2), pp. 123–149 (https://doi.org/10.1080/15391523.2009.10782544).

3.4.2 Artefacts

To support data from interviews, analysis of artefacts or teaching and learning documents provides a useful source of information and helps researchers to obtain a more in-depth understanding of the phenomenon researched (Neuman, 2014). In this research, using document analysis allowed me to analyse and interpret shared documents related to the integration of ICT in education and in particular for teaching Spanish literacy, thus helping to answer the research question (Stojanov, 2014; Yin, 2015). First, the artefacts provided an overview of teachers' professional development activities and what they used in their everyday classroom to teach Spanish language in secondary schools. Second, artefact analysis served to corroborate statements from interviewees about how they planned and used ICT towards developing critical reading in their students (Yin, 2014). Third, the review of the artefacts also helped to validate the truthfulness of the teachers' perceptions regarding their proposed class assignments compared to the answers given during the interview; thus, it was important to establish the artefact's reception after the interviews.

The artefacts analysed for this research included lesson plans, presentations, and course assignments designed and used by the interviewed teachers. Each interviewed teacher was asked to send a selection of up to three teaching artefacts used by themselves and, which they felt demonstrated how ICT integration was done in their classes. This also aided in the triangulation process, improving rigour. To assist the interviewed teachers' selection of the best artefacts, the following criteria based on the work of Mouza and Karchmer-Klein (2013) was presented to them:

1. The artefact must have been used at least once by the teacher before this research.
2. The learning goals for the artefacts must be clearly stated for the researcher, either as part of the artefact itself or in a side note.
3. The teacher must agree that this specific artefact had a professional relevance for its previous use, either personal or as stated by the students.

3.5 Data Analysis

Due to the vast quantity of information that a qualitative case study usually yields, it is very important to break it into stages that facilitate the processing of the

data, which produces a better analysis (Lichtman, 2010). The first step is to prepare the data, then it should be reviewed, and finally, thematic analysis can be conducted.

3.5.1 Data Preparation: Transcribing, Translating, Reviewing

As Colombia's native language is Spanish, nine sets of data were collected and recorded in this language. The first step to start the data organisation was to transform the recorded audio interviews into texts, a process commonly referred to as *transcribing* (Adu, 2019), a process whose quality is imperative to the dependability of analysis (Braun & Clarke, 2006).

Transcription can be time-consuming and costly work, with statistics of four transcribing hours for every audio hour recorded (Hopper et al., 2021), but thanks to innovations in ICT tools this process is nowadays quicker and cheaper, as at the same time that the interview is being recorded, the transcription process can be done (Hopper et al., 2021). This process is achieved via voice recognition software (Bokhove & Downey, 2018), a system which has improved its accuracy significantly due to continuous refinement of the used algorithms (Liao et al., 2013). Nevertheless, I still reviewed the transcripts for any clarity issues to increase accuracy, obtaining nine verbatim transcripts.

After the transcription process was completed, I sent each interview via email to its respective participant for them to do a member check, a common way of ensuring that what was recorded in audio and what was transcribed is coherent and an accurate representation of what the interviewee intended, which also assists to strengthen trustworthiness in the research (Kvale, 2011). Once feedback was received from each of the nine participants, I reviewed the transcripts and completed nine final versions of each interview.

The next step was the translation of the interview's transcripts from Spanish language to English language, a process done by me. My native tongue is Spanish and I achieved a C1 level in the International English Language Testing System (IELTS) test. The first step in the translation process involved using the Google Translate commercial website, a kind of ICT that has increased productivity and quality in translation (Doherty, 2016). I then checked the results provided by Google Translate for accuracy.

By examining each of the transcripts and translations, I also commenced to fulfil the second part of the data organisation, its review. Carefully reading the transcripts and the translations allowed me to re-read and to understand each interview, an important process towards successful analysis (Adu, 2019).

3.5.2 Thematic Analysis

With the data now correctly transcribed, translated, and organised, and I as the researcher familiarised with it, the process of analysis started. To analyse the data, a thematic analysis method was used, allowing the construction of substantial categories and the codes needed to transcend the raw data towards building new knowledge (Miles, 2014). Thematic analysis is a technique for interpreting text or data records such as documents based on the systematic, objective, replicable, and valid reading of the information collected (Clarke & Braun, 2017). What is characteristic of thematic analysis and distinguishes it from other research techniques is how it intrinsically combines the observation and production of data with its interpretation or analysis. Such a process allows for the systematic interpretation of the information examined, from the formulations of the informants in an interview to access deep information to compare it with that of other interviewees, and from this analysis-comparison process, obtain a more deep and complete knowledge than that obtained from the analysis of only one of the interviews and without contrast with the documents (Lopezosa, 2020).

The prepared dataset was run in a computer-assisted qualitative data analysis software (CAQDAS) (Silver, 2018), a type of software increasingly used by researchers to manage and analyse text data gathered from interviews, documents, field notes, and open-ended questions (Woods et al., 2016). It is argued that the process improves systematisation, trustworthiness, reflexivity, and operational effectiveness for researching (Sinkovics & Alfoldi, 2012). NVivo was the CAQDAS software chosen for this thematic analysis since it allowed me to organise, prioritise, code, and rearrange the data as necessary. A secondary advantage of using NVivo was that it is fully licensed to QUT students, which meant that I could procure technical support from QUT personnel if needed and avoid unnecessary delays. Finally, NVivo stands out for being a tool capable of automating non-numerical data such as interviews and textual content, and thus, it helps researchers to analyse large sets of qualitative data by systematically coding relevant text, creating and categorising codes, and visualising

the results (Adu, 2019; Hilal & Alabri, 2013). Consequently, I used NVivo to help organise all files, codes, categories, and themes for the analysis.

Having chosen a technique and tool to analyse the data, I started the analysis. This was achieved by importing all the relevant data into NVivo, as explained in the next section.

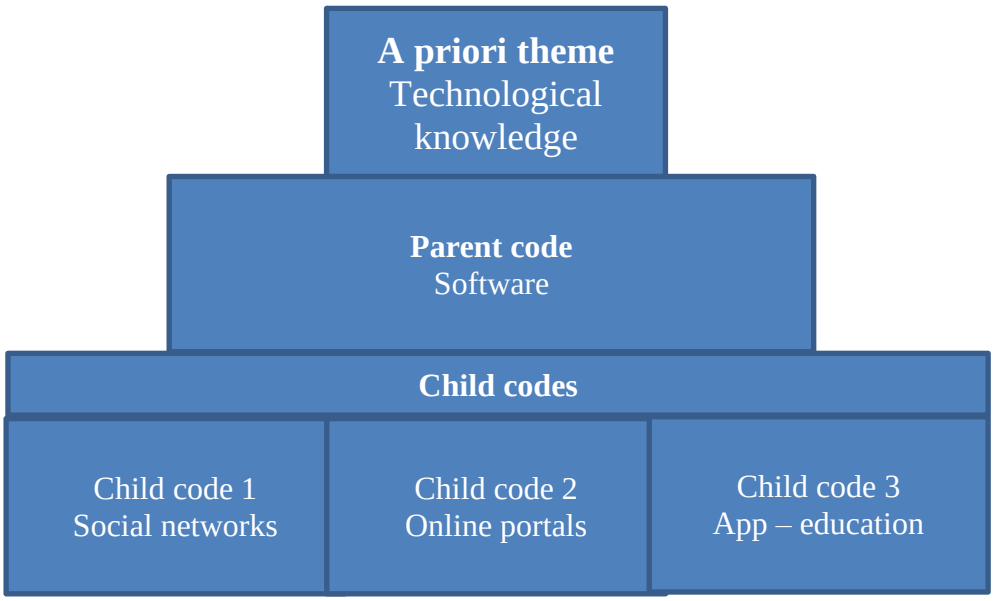
3.5.3 Coding and Using NVivo

Coding consists of organising the raw, unanalysed data into subjects or codes that can be linked to themes (Baralt, 2012). A *code* is a short statement or keyword that the researcher chooses to represent a fragment of the data, and consequently, the codes classify, synthesise, and help to analyse the data that describes essential information for the intended study (Creswell, 2014; Miles, 2014). For this research, the data codes were formulated from concepts, actions, and relationships relative to the teachers' descriptions of their ICT use, in accordance with the TPACK themes and how professional development activities facilitated the teachers' TPACK development. These codes condensed the data into analytic units that could be compared with the TPACK framework to corroborate and explain the use of technology as intended in the research questions.

To achieve the codes to analyse the data, three main steps were followed. First, the literature review on the TPACK framework was used to create a priori themes. Second, similar words and phrases found in the interviews were merged into codes, which led to the third step, aggregating these codes into one of the eight a priori themes using the NVivo software. Correspondingly, two types of codes were used: child codes and parent codes. Child codes refer to the basic units of information found throughout the interviews and combined into a code. But when these codes refer to a single idea that can be further synthesised, it is possible to merge all of their properties into a single, new code called a parent code. Figure 3.1 depicts how themes, parent codes, and child codes were hierarchised.

Figure 3.1

Example of Themes, Parent Codes, and Child Codes



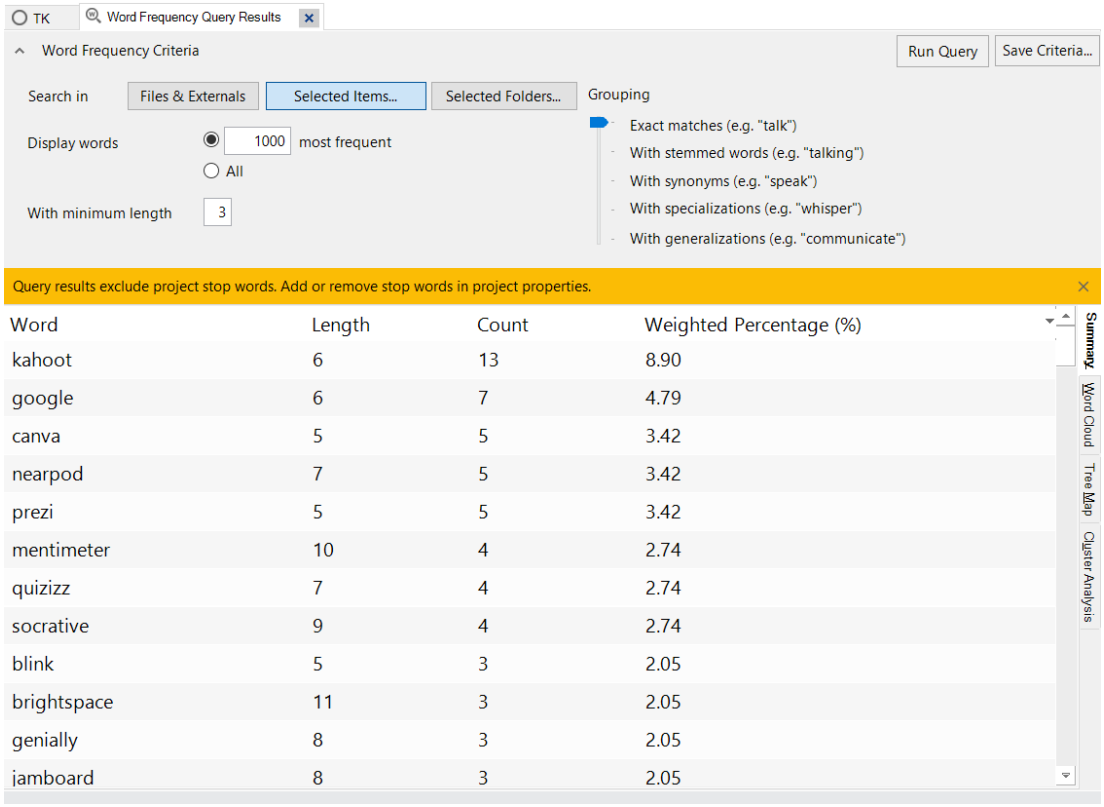
As stated above, the first step was the definition of the a priori themes. The TPACK framework provided the basis for the a priori themes used in this thematic analysis, drawing from the eight knowledges explored in Chapter 2, namely, TK, PK, CK, TPK, TCK, PCK, TPACK, and XK. These themes were used to analyse the two sets of data by reviewing codes and linking them to an appropriate theme. An example of how the codes were logged into a priori themes is shown in Figure 3.1, where the parent code *Software*, formed by the child codes *Social networks*, *Online portals*, and *App – education*, were bounded into the TK a priori theme.

The start of the second step was importing the transcripts collected into NVivo, where a project was created under the name "Use of ICT to support critical reading in Bogotá – Data". All the interview and artefact files were stored and organised in this project to maintain an ordered master file.

To achieve the first set of codes by top frequency of the words and phrases used by the interviewees, the files were run with the word frequency query tool set to find the top 50 most frequent stemmed words instead of simply the exact matches, since grammar might reduce the number of hits and develop into a biased problem. Figure 3.2 illustrates an example of this process, and the words "Kahoot", "Google", and "Canva" correspond to the top three keywords, ignoring connectors.

Figure 3.2

The Word Frequency Query Tool in NVivo



Afterwards, the keywords drawn from NVivo were compared to their context in the transcription to check if the meaning was the same in every appearance; the words that were considered equal were formulated into first-level codes, or child codes (Flick, 2014). The child codes were then analysed, and the ones whose content was deemed redundant were synthesised and merged into words that kept the essential information. Then, the analysis moved into developing an initial list of subcategories or parent codes, ideas that are one level of abstraction over the initial codes, allowing several child codes to be grouped under the same parent code (Baralt, 2012). For example, child codes like *Social networks*, *Online portals*, and *Apps* can be categorised under the parent code *Software*.

3.6 Research Rigour

All scientific research must be adapted to procedures and markers that confirm its quality, as well as allow the detailed and scientific application of research procedures and analysis techniques to be evaluated to obtain and process data and

make accurate interpretations. In quantitative research, terms such as reliability and validity of any research are essential to guarantee recognition and confidence in its results; consequently, it is necessary to mention the strategies adopted in qualitative procedures to avoid deficiencies and ensure that the process is accurate and rigorous (Miles, 2014). In this research, strategies for analysing, interpreting, and determining the dependability, credibility, and applicability of data were employed through previously discussed procedures such as coding, member checking, and triangulation (Chowdhury, 2015)

Research rigour related to data analysis starts with procedures of data organisation, as this helps towards achieving a reliable study and clarifying the results of the research (Yin, 2015). Coding actions were consistent through the analysis of each participant's data. This allowed for the creation of a reliable set of information for each participant, that was analysed on the same software and on equal terms.

To assess method effectiveness, the researcher must pay attention to how the methods used in the study complement each other to correct the inevitable biases that are present in each single one, thus favouring the optimisation of outcomes while improving the consistency, dependability, and operability of the study (Farquhar & Michels, 2016). A strategy to address this is triangulation, which is a procedure that helps to mitigate possible biases that can derive from any isolated approach by itself, and tries to promote a cooperation between different methods towards the enrichment of the information obtained. Triangulation also facilitates the validation of data through cross-verification and provides a more comprehensive and balanced understanding of the phenomena studied (Noble & Heale, 2019). Therefore, the practice of triangulation for research purposes is characterised by the use of different but complementary methods or data to address the same objective of study, where the phenomena studied can be better understood when approached from different perspectives and with a variety or a combination of research methods and data. Credibility and dependability for this qualitative case study was characterised by my focus on accurately representing the participants' views, using member checking and triangulation of data (Yin, 2014). To ensure the reliability of participants' perspectives, one-on-one interviews were conducted in an open-ended manner, with each participant receiving identical lead questions. This approach permitted individual interpretation of the questions. However, follow-up questions diverged to enable a more in-depth

exploration of each participant's responses, aligning with the research questions. The establishment of appropriate interview and data management protocols further bolstered the reliability and relevance of the study.

The data collection procedures also aim to establish reliable and consistent research: As highlighted by Creswell (2014) and Yin (2016), the reliability of the data collection process serves as a means to validate the study's results. In order to confirm that the interview transcriptions accurately represented the participants' statements, the transcribed interviews were shared with the participants for member checking before proceeding to coding and data analysis, as mentioned earlier. Each transcribed document was sent to each respective participant for their review and returned to me after the member checking process was completed. Any misunderstandings identified by the participants were addressed, ensuring that the transcriptions accurately and comprehensively captured the thoughts of the teachers.

3.7 Ethics

Creswell (2014) claims that ethical issues should be thoroughly judged in order to illuminate any potential harm or risks that may occur to participants, and therefore, it is a primary matter for the researcher. Consequently, awareness of the ethical issues in every step of a research project is mandatory but is especially important during the collection, analysis, and reporting of the data due to the availability of third-party information.

To avoid any inconveniences and problems for the participants in this study, strict measures were applied to ensure their confidentiality as well as to minimise any potential psychological, physical, social, or legal risks that could arise. Consequently, this study complied with all QUT ethics guidelines after an ethics application for the study was submitted to the QUT Human Research Ethics Committee and was approved (QUT Ethics Approval Number 4615) on December 2, 2022. According to these guidelines, the study fell into the category of low risk in data collection, since the only consequences for any participants were discomforts and inconveniences caused by interviews and observations.

Therefore, understanding how it is necessary for research subjects to be ethically aware of the measures taken (Tobin, 2015), informed consent forms and study

information documents were sent to every possible participant of the study (see Appendices C, E, and F).

3.8 Summary

This study aimed to investigate the integration of ICT tools by Spanish literacy teachers in private secondary schools in Bogotá, Colombia, with a focus on achieving critical reading skills. The research question explores how these teachers use ICT to teach critical reading in this specific context. Using the TPACK framework, the study employed a qualitative exploratory case study approach to understand the motivations, opinions, and practices of Spanish literacy teachers. Data collection involved interviews and examination of documents/artefacts created by teachers, such as guides and assessments, to triangulate information. The qualitative approach allowed for a deep analysis of teachers' perceptions and their actual integration of ICT in teaching critical reading. The study's design was a single case study, acknowledging the complexity of the education system in Bogotá. The case study method was chosen to explore the contemporary phenomenon within its natural context, providing insights into the integration of ICT in secondary school critical reading courses. The case study approach ensured a focused investigation of the research question while engaging with various stakeholders within the educational context.

The study employed convenience sampling, a non-probabilistic technique, due to practical constraints such as limited funding and a tight project timeline. The sample comprised nine Spanish literacy teachers in secondary education in Bogotá, selected based on specific criteria related to their employment, teaching experience, and use of ICT. The criteria included current or recent employment as Spanish literacy teachers, a minimum of 5 years of teaching experience at the secondary education level, and a demonstration of using ICT in delivering Spanish literacy and/or critical reading courses. The study aimed to gather in-depth insights from experienced teachers to address the research questions effectively. The recruitment process involved contacting IB schools, known for their rigorous academic standards and emphasis on research and writing skills. Online data collection, necessitated by the COVID-19 pandemic, used semi-structured interviews and document analysis. The interviews, conducted using Zoom, were guided by an interview protocol, and participants were asked to provide artefacts electronically. The study used a member-checking process,

involving participants in validating the transcription and ideas presented in the interviews. The study employed artefact analysis in addition to interviews to gather information about the integration of ICT in education, specifically for teaching Spanish literacy. Artefacts, such as lesson plans, presentations, and course assignments, were provided by the teachers and analysed to gain a deeper understanding of their professional development activities and the use of ICT in their classrooms. Overall, the study adopted a systematic approach, acknowledging the challenges posed by the pandemic, to explore the integration of ICT in teaching Spanish literacy and critical reading in Bogotá's secondary schools. This analysis served to validate teachers' statements from interviews and assess the relevance of artefacts to the proposed class assignments. Teachers were guided in selecting artefacts based on criteria emphasising prior use, clearly stated learning goals, and professional relevance. The artefacts, coupled with interviews, facilitated triangulation, enhancing the study's rigour.

Thematic analysis was conducted and coding procedures were consistent, and triangulation was employed for data validation. Research rigour was maintained through member checking, ensuring accurate representation of participants' views, and triangulation of data. Ethical considerations were vital, with measures taken to ensure confidentiality, minimise risks, and obtain informed consent from participants following QUT ethics guidelines. The study adhered to ethical principles, as reflected in the approved ethics application from the QUT Human Research Ethics Committee.

Chapter 4: Results and Analysis

Chapter 4 presents the results and analysis derived from the empirical work conducted with nine Spanish language critical reading teachers from different private schools located in Bogotá DC, Colombia. As described in Section 3.4, nine individual datasets were collected, one for each participant teacher. Each dataset contains the participant's responses attained through the semi-structured interview, plus examples of teaching artefacts to corroborate those responses. During the interviews, participants answered a previously designed set of questions, plus new prompts arising during the interviews to seek more detailed responses. In the context of this case study, each interviewee was assigned a pseudonym from 1 to 9 (Int01, Int02, …, Int09), a practice that aligns with ethical guidelines and fosters a more objective examination of the data. When participants mentioned using teaching artefacts to support their teaching of critical reading, they were asked to send examples of these artefacts, which were used to develop deeper understanding of the participants' responses regarding the real classroom activities mentioned. Since the artefacts are in Spanish language, the captions underneath each artefact will be used to translate its relevant contents following a left-to-right process, starting at the top left side of the artefact and scanning the contents from left to right, moving through the text in a linear fashion.

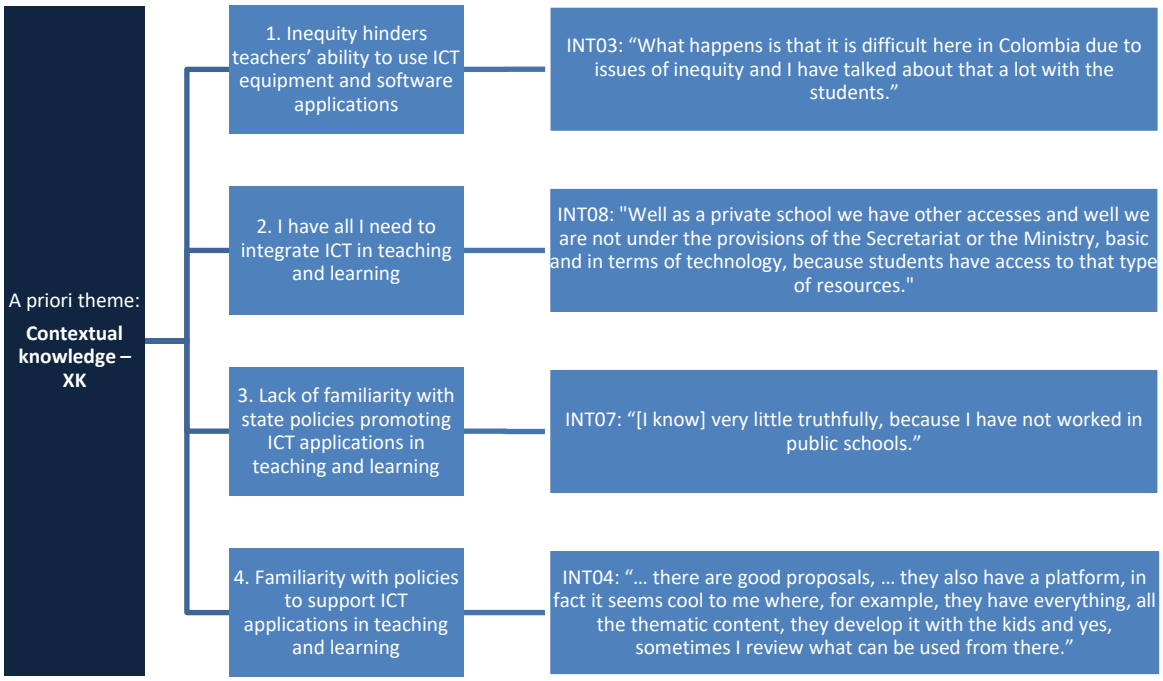
Following the steps established in Section 3.5.2, Thematic Analysis, I started the analysis of the interviews and then merged the artefact data with the interview data analysis to provide a rich interpretation of the results attained. With the eight a priori themes established, one for each TPACK knowledge type, the analysis of the data allowed me to search for common ideas, depicted by certain terms or phrases that could be grouped into codes using the NVivo software. These codes were then organised thematically under each of the eight a priori themes; consequently, the findings in this chapter are presented separately for each of the a priori themes drawn. The first analysis investigates the context (XK) within which each participant was working. This is followed by analysis of the three base knowledge types, TK, CK, and PK. Following these analyses, I explore the overlapping themes between the base knowledge types as shown in Figure 2.2, that is, PCK, TCK, and TPK, concluding with the holistic TPACK. Finally, a summary of the chapter is presented.

4.1 Context: Where Learning Happens – XK

As established in Section 2.4.1, the TPACK framework sits within a bounded contextual knowledge – XK. Understanding the context is critical for any appreciation of where and how ICT integration can or cannot occur under the TPACK framework. In the semi-structured interviews conducted, one question was developed to directly investigate contextual issues: "Do you consider that today's societies and technological changes are being delved into deeply enough by the Ministry of Education, the Secretary of Education, and other policymakers?" Participants provided their views about the context for supporting ICT integration in Spanish language classrooms. The analysis identified four parent codes that were aggregated under the a priori theme XK: 1. *Inequity hinders teachers' ability to use ICT equipment and software applications*; 2. *I have all I need to integrate ICT in teaching and learning*; 3. *Lack of familiarity with state policies promoting ICT applications in teaching and learning*; and 4. *Familiarity with policies to support ICT applications in teaching and learning*. Figure 4.1 presents these parent codes and extracts from the interview narratives to illustrate how the codes were identified.

Figure 4.1

A Priori Theme: Context – XK



Note. ICT = information and communication technologies; INT = interviewee.

The four parent codes in Figure 4.1 show teachers' perceptions of how the context may impact the acceptance of ICT in education. The positive and negative perceptions mentioned by the teachers regarding their teaching context illustrate the diversity in opinions about how context influences teachers' professional judgement and use of ICT tools in their teaching strategies. The participants also recognised that the context is strongly influenced by policymakers' abilities to advocate and support the benefits of ICT in teaching and learning.

The first XK parent code is *Inequity hinders teachers' ability to use ICT equipment and software applications*. It refers to the teachers' negative sentiments that the policies led by the national government do not support equal access to ICT, either across the country or for individual participants' local geographical context. Four participants described how they perceive that the policies show suboptimal results as a consequence of the economic disparities across the country that keep public schools and their students from receiving access to quality and affordable connectivity and infrastructure to effectively integrate ICT in the educational context. The two issues mentioned by the majority of participants were **inequity**, as noted by INT03 and INT09, and **access**, as noted by INT01, INT04, INT05, INT07, INT08, and INT09. On the subject of inequity in Colombia and in Bogotá at every educational level and in every kind of educational institution, and the difficulties it carries for access, INT05 stated:

> I think it's a structural issue. In a country with such broad and diverse needs, the impact of these entities is very deficient, because there are very remote regions that they cannot reach. And I'm not just referring to Chocó or La Guajira. Here in Bogotá, there are zones, there are localities in which access to a computer, to a book, is null. So, it seems to me that the work to be done in the field of education and [ICT] coverage is very broad, yes, there is still a lot of work yet to be done. (INT05)

Despite the above negative perceptions shared by participants about their ICT policy context, there were three teachers who stated positive perceptions about their XK during the interviews. The positive views mentioned by INT01, INT08, and INT09 were grouped into the second XK parent code: *I have all I need to integrate ICT in teaching and learning*. These responses are not focused on the policies forwarded in Colombia by either the MOE or the Secretary of Education. Instead, the teachers discussed their specific context, the private schools where they currently worked, and how it provided them with "high-class school" (INT01) benefits, like reliable

infrastructure and connectivity for integrating ICT into their day-to-day teaching activities. Such responses highlight an argument about the contrast between private schools and public schools that was explored in Section 1.7, Research Site Context: Bogotá DC, where it was discussed how private schools constantly deliver better academic results than their public counterparts due to the characteristics of the hired teachers and the educational infrastructure they possess.

Next, the third XK parent code, *Lack of familiarity with state policies promoting ICT applications in teaching and learning*, was identified from the responses of participants INT06 and INT07, who stated they were unaware of any government educational policies. In light of their workload, teachers in most private schools only need to keep up to date with the school policies where they work. Therefore, they do not need to be professionally aware of government educational policies, since public policies are not directly relevant to their day-to-day work in private schools. For example, INT07 answered: "[I know] very little truthfully, because I have not worked in public schools." Nevertheless, it is interesting to find that the teachers working at these private schools do not need to be aware of the national government's educational policies. Private schools in Bogotá have the choice to teach the items found in the national curriculum in the order and way they see fit, as long as the students have the knowledge needed to present and pass the standardised ICFES tests.

Regardless of the previously discussed lack of knowledge by interviewees INT06 and INT07 about national policies for integrating ICT in education, two other teachers considered that certain government policies have positive aspects, and their responses were coded as the fourth XK parent code, *Familiarity with policies to support ICT applications in teaching and learning*. For example, the results of such policies include the collaboratively created open access materials that are hosted on national web portals for teachers, parents, and students. INT04, the only participant who had worked in both public and private schools, discussed these learning materials alongside her positive perceptions about the content created under state policies. Artefact 1 (Figure 4.2) is an example of such open access learning resources, a library called Colombia Learns (found at https://www.colombiaaprende.edu.co/) that was shared by INT04 and where she finds online teaching materials created by teachers that align with her teaching strategies:

> … there are good policy proposals, … they also have a learning platform, in fact it seems cool to me where, for example, they have everything, all the thematic content, they develop it with the kids and yes, sometimes I review what can be used from there. (INT04)

Figure 4.2

Artefact 1: Colombia Learns Digital Library

Note. Translation: Welcome to the digital library of Colombia Learns! This digital library is part of the National Reading and Writing Plan in force throughout the national territory and has 3,200 titles available that can be downloaded to a computer, tablet or smartphone so that children, young people and their caregivers can enjoy reading and world literature. This library has high-quality content in different formats such as Ebooks, audiobooks, magazines, as well as audiovisual material in all areas of knowledge. If you want to know a little more about it, watch the following video.

In summary, the understanding of XK by the participants was impacted by their involvement and their professional experience. The participants' responses about their context showed mixed reactions and different perspectives, yet it is important to acknowledge how the participants understood the positive or negative impacts that the context had on their abilities and possibilities to integrate ICT for critical reading teaching and learning. However, it is interesting to note how the private school teachers seemed to be mostly unaware of government policies as they needed to be aware of their own school's policies rather than state policies; this constitutes a partial XK. Drawing from this analysis of XK, five out of nine teachers discussed their views about the strong deficiencies in the integration of ICT in teaching at public schools.

These participants commented that more work needs to be done if public schools are to catch up to their private counterparts in benefiting from the use of ICT in Spanish literacy classes and providing the same level of education. This initiative needs to be started by creating policies that provide public schools with the necessary infrastructure and connectivity.

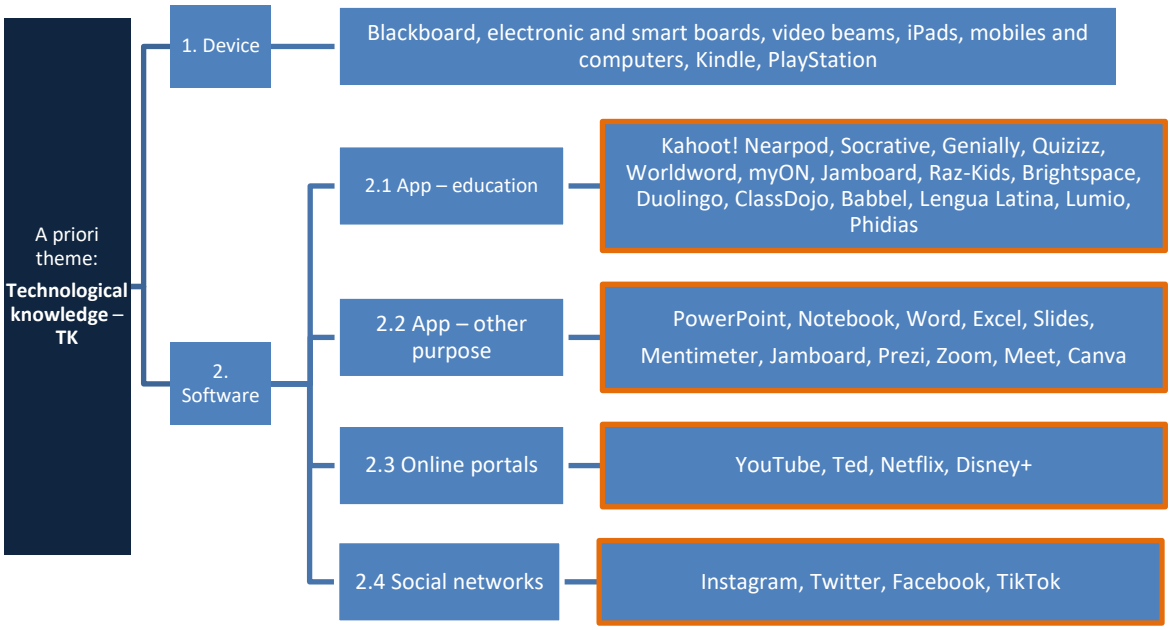
On the other hand, some participants provided positive comments about the government's policies but still claimed that there are areas to improve. Regarding a wide view of Bogotá's school context, the experience of INT04 was unique, having worked in public schools but now being part of the private "high-class" institutions. Her perspective differed both in what she said and in how she taught, as INT04 had positive comments not only about some state policies but also through her use of digital materials provided by the state.

4.2 Technological Knowledge – TK

As noted in the TPACK model, an important aspect of teachers' competency with use of ICT in daily teaching comes from their ability to use technology, not only in their work, but also as part of their day-to-day life outside the work environment, as this improves their confidence and practice. Familiarity and fluency with technology increases the likelihood of teachers using ICT in their Spanish literacy classrooms. These issues are relevant to start addressing research sub-question 1: *What is the competency level of secondary school Spanish literacy teachers in Bogotá to integrate ICT to teach critical reading?* Hence, to better understand the participants' perceptions about their use of ICT outside the workplace, they were asked: "What ICT tools and devices do you use in your day-to-day life?" The responses were coded and aggregated under the a priori theme TK, and two parent codes were identified from the data: 1. *Device*, and 2. *Software*. Additionally, the code *Software* has four child codes noting the different types of applications used by the participants in their daily lives: 2.1 *App – education*, 2.2 *App – other purpose*, 2.3 *Online portals*, and 2.4 *Social networks*. Figure 4.3 presents the two parent codes, the child codes, and extracts from the data to illustrate how the codes were derived.

Figure 4.3

A Priori Theme: Technological Knowledge – TK



The *device* code refers to the types of equipment used by the teachers as part of their professional and non-professional daily lives. Taking a broader perspective allows the analysis to appreciate the competency level of the individual with particular ICT devices. If the device is used only in classroom times, it is likely the teacher's competency and confidence in using it will be limited, while if the use of a particular ICT tool is also found outside classrooms, the comfort – or fluency with it – is likely to be higher (Henriksen et al., 2019). In their classrooms, the participants used a core set of devices like the blackboard, electronic and smart boards, video beams, iPads, mobile phones, desktops, and laptops. However, none of the teachers specified a school policy that led to the use of these ICT tools, which suggests they use them of their own volition and depending on how each device suits their individual teaching needs. Further, it is interesting to note how the number of different types of devices used by the teachers increases when complemented with the devices they use outside school for personal reasons, with some of them reporting the use of Kindle devices to read (INT02) and PlayStation consoles for leisure (INT07), or the use of online platforms like Spotify (INT05), where the participants find contents they later use in their classes, an integration between TK and PK that will be discussed in later sections. These findings suggest that most teachers are able to access a wide range of devices in

and outside of school; thus, the participants have a good level of ICT literacy, which they may use to teach critical reading. As previously discussed, this competency in using ICT is very important to support teachers' motivation to use ICT in the classroom and their competency for integration of the TPACK knowledges.

The second parent code under the a priori theme TK is *Software.* The responses provided by the participants offered a large number of references to various types of software, apps, and platforms, as they use different ICT tools both professionally and for personal endeavours outside the school context. These ICT tools were grouped into four child codes. The first child code is *App – education*, and it relates to all the ICT tools discussed by the participants that were designed for education purposes; their quantity can be appreciated in Figure 4.4, which depicts a word cloud of the most-used education software. Among them, the GBL platform Kahoot! was the most referenced, with 26 appearances. Since the use of Kahoot! is broad in the sample, Artefact 2 (Figure 4.5) provides an example of its use by INT08 to assess the students' understanding of a chapter read during class time. The participants also discussed the use of Nearpod (12 references), Socrative (8 references), Genially (6 references), and Quizizz (5 references); Duolingo (2 references): Worldword, myON, Jamboard, Raz-Kids, ClassDojo, Babbel, Lengua Latina, Lumio, and Phidias are referenced once in the answers as shown in Figure 4.4. Additionally, the second child code is *App – other purposes*, which encompasses the software discussed during the interviews that is not designed for educational purposes. This code is led by productivity software, mainly the Microsoft Office suite of programs like PowerPoint, Word, and Excel. Nevertheless, the participants showed greater knowledge and use of other apps besides the pre-installed ones, including presentation apps like Google Slides, Mentimeter, Jamboard, and Prezi; communication software such as Zoom and Google Meet; and design applications like Canva.

> "INT02: These tools offer us a variable amount of triggers that are very useful in, let's say, in the workshop session Padlet, as I mentioned, then it's a tool that allows a variety of things since the guys, what I was telling you, well is that for writing they can record the screen, they can record their voice, let's say in exercises that are not written production but let's say comprehension and transfer to other registers such as orality, then it works a lot. Well, the classic Kahoot! although to me, although I prefer to use Quizizz, it seems to me that it is a slightly more complex tool because it allows not only to design the test, the quiz so to speak,

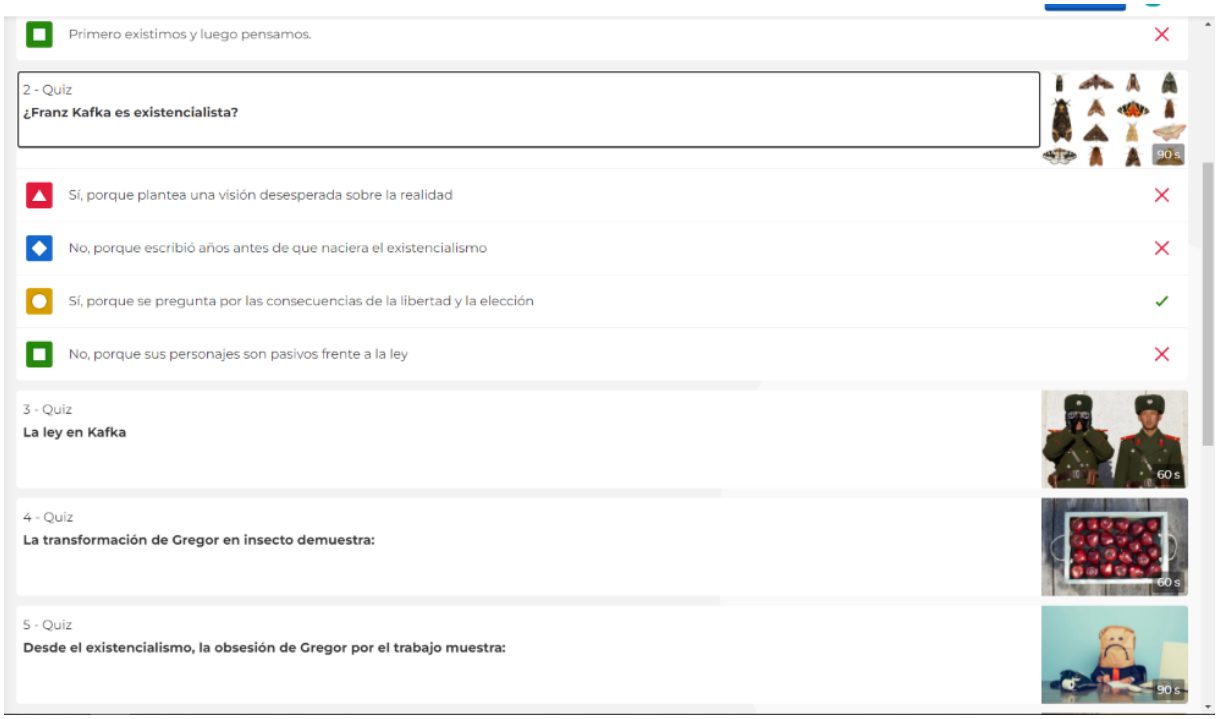
but also a guided lesson, so the guided lesson allows the inclusion of text or audiovisual material, videos, references, clarification of concepts and some slides are for content and other slides are "x" for questions, so it allows control and guided development of the session. Sometimes in Kahoot it's like 'well, let's answer the 10 questions and look at the leaderboard' and that's it, but Quizizz allows for a little more guidance in that process... in the combination of those that I've told you just now... and Google's Jamboard , which is also a very useful tool, because it also allows this interaction between different groups of students, for example, if they are working together, it allows cooperative work."

Figure 4.4

Word Cloud of Most-Used Education Software

Figure 4.5

Artefact 1: Kahoot! First We Exist and Then We Think



Note. Translation:
2 – Quiz
Franz Kafka is an existentialist?
Red triangle: Yes, because he presents a desperate sight of reality
Blue diamond: No, because he wrote years before existentialism was born
Yellow circle: Yes, because he questions the consequences of freedom and choice
Green square: No, because his characters are passive in front of law
3 – Quiz
Law in Kafka
4 – Quiz
Gregor's transformation into a bug demonstrates:
5 – Quiz
From existentialism, Gregor's obsession with working shows:

The third child code is *Online portals*, and refers to websites that host entertainment content as shared by INT03, INT04, INT05, INT06, and INT07. The online portals used the most by the participants are YouTube and Ted, which they enjoy in their personal time but from which they also use content in their teaching strategies. Additionally, other online portals shared by the participants are their professional and personal email plus leisure-time streaming sites like Netflix and Disney+. Finally, the fourth and last type of child code is *Social networks*, and it aggregates the keywords referenced for social networks like Instagram, Twitter, Facebook, and TikTok, which INT02, INT04, INT07, and INT08 mostly use during their free time, as the schools have policies against their viewing in class, a situation that will be discussed in Section 4.7 on TPK. Nevertheless, the fact that seven participants are willing to use different online portals and social networks is a sign of their fluency with such portals.

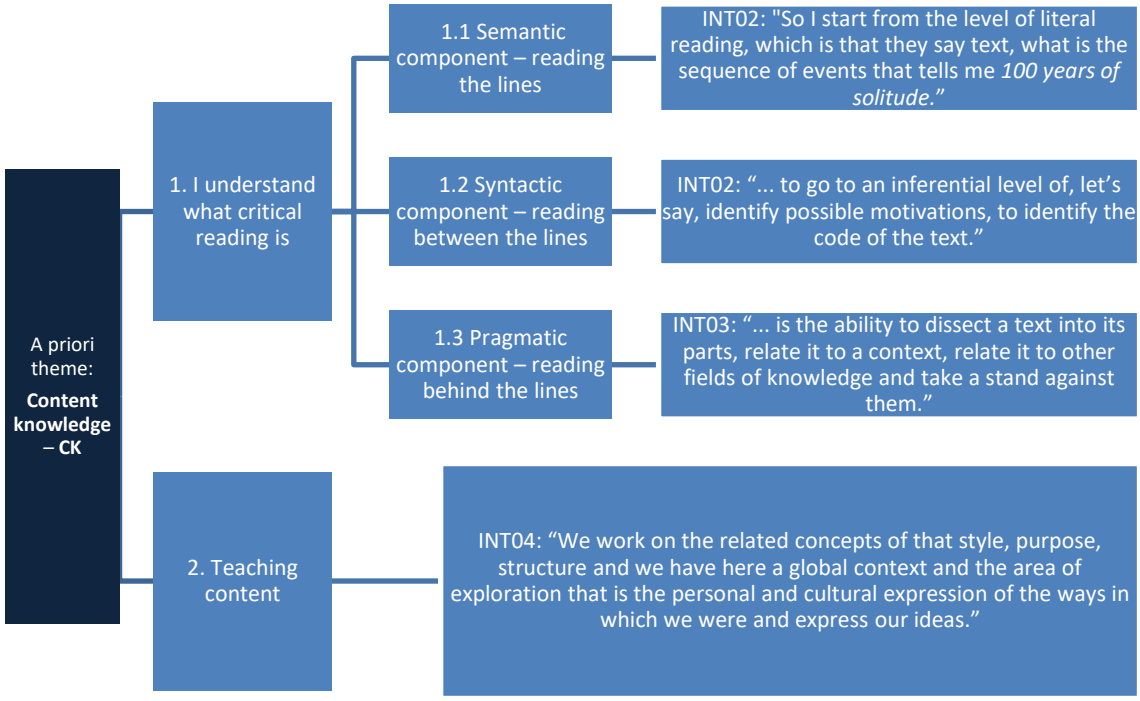
The codes described above provide evidence of the participants' TK and examples of the uses of ICT both inside and outside the classroom. As previously described, there is a possible correlation between the use of digital technologies outside the workplace and the willingness of teachers to integrate such ICT into the teaching practices. The examples provided illustrate the competency of teachers in using digital technologies, a positive sign of the participants' competency to use ICT for teaching critical reading. All the participants described a reasonable level of competency, demonstrated by the wide array of ICT options they use in their free time as well as the ones they integrate in the classroom: from using one or many different types of presentation software to deliver content, using office programs to improve productivity, or applying educational video games as part of their teaching strategies. Seven participants also described their daily use of either social networks or online portals for reading news and for fun. This familiarity and interaction with online portals may provide a correlation between the teachers' use of digital technologies such as social networks outside the workplace and a willingness to integrate them into their teaching strategies. Accordingly, this software use relates to the different strategies discussed in Section 2.3, namely, online learning, blended learning, and DGBL.

4.3 Content Knowledge – CK

The third sub-question of this research project is *What is the subject content knowledge competency level of secondary school Spanish literacy teachers in Bogotá DC?* To understand the CK of the participants, two interview questions were asked: "What content do you usually teach in your Spanish language courses?" and "What does critical reading mean for you?" The answers provided were analysed and two parent codes were identified: 1. *I understand what critical reading is*, and 2. *Teaching content*. Additionally, the first parent code has three child codes: 1.1 *Semantic component – reading the lines*, 1.2 *Syntactic component – reading between the lines*, and 1.3 *Pragmatic component – reading behind the lines*. Figure 4.6 presents the two parent codes, the child codes, and extracts from the data to illustrate how the codes were derived.

Figure 4.6

A Priori Theme: Content Knowledge – CK



Note. INT = interviewee.

All the participants reported their knowledge about what critical reading is in their own words, and their responses are coded into the parent code *I understand what critical reading is*. From the interview responses collected, none of the teachers referred to any

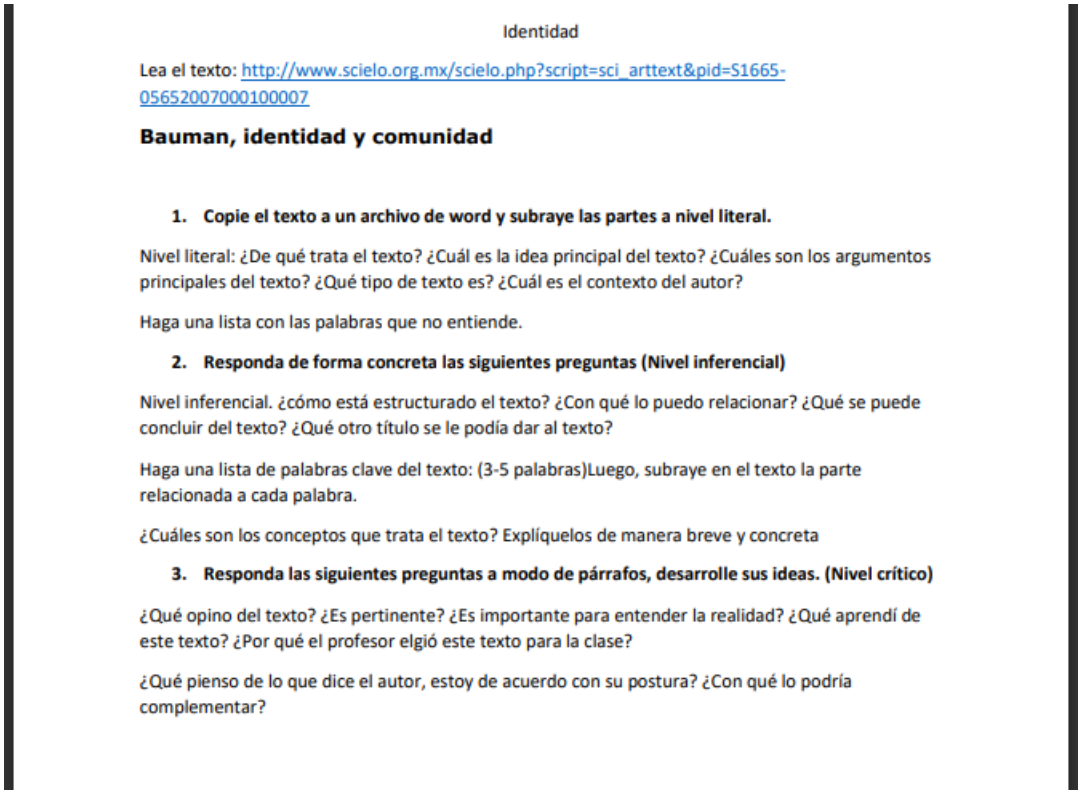
author, framework, or policy when explaining their understanding of critical reading. However, all the participants discussed the semantic, syntactic, and pragmatic components previously examined in Section 2.2.2, Reading and Critical Reading, where it was explained how these three components build the reader's ability to understand texts critically, leading to the three child codes identified above and shown in Figure 4.6. Recapping, the first component is the semantic component, which describes the ability to understand the written code to interpret the words and their literal meaning; this component should be mastered in primary school. Second, the syntactic component describes the ability of the reader to take any text and interpret how its constituent elements are structured to construct its overall significance through cognitive mechanisms such as inferences, associations, or analogies. In this regard, it is essential for the reader to identify and comprehend how the local elements that comprise the text are semantically and formally interconnected, a set of abilities that are first approached during primary school and are expected to be mastered by eighth grade. Finally, the pragmatic component describes how reading involves understanding the social, cultural, and ideological context in which the text was written and is read. Consequently, readers construct meaning based on their knowledge of the author and the author's context, plus the reader's own sociocultural background, reading objectives, attitudes, values, and position in society. Pragmatic reading understands how the meaning of words and phrases is socially constructed and influenced by both the author's and the reader's worldview, perspectives, ideologies, beliefs, and emotions.

The analysis shows that all the participants addressed the syntactic and semantic components together, an approach consistent with teaching at a secondary school level, where the students are expected to understand the code, structure, grammar, phonology, and morphology (syntactic component) and to decode the expressions, phrases, and themes that appear in the textual and audiovisual contents provided under each school's curricula (semantic component), thus following the hierarchic nature of the Colombian critical reading teaching framework. As discussed in Section 2.2.2 of the literature review, when the three components are found together, critical reading is achieved: moving up from the basic semantic component towards syntactic reading and finally achieving the pragmatic reading. Some of the participants' pedagogical strategies also share this process, as can be seen in Artefact 3 (Figure 4.7), a critical reading lesson plan shared by INT03 where he created three separate questions, each

one addressing one of the separate components. With such an approach to pragmatic reading, INT03 is developing "the ability to dissect a text into its parts, relate it to a context, relate it to other fields of knowledge and take a stand against them".

Figure 4.7

Artefact 2: Bauman Critical Reading Lesson



Identidad

Lea el texto: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-05652007000100007

Bauman, identidad y comunidad

1. **Copie el texto a un archivo de word y subraye las partes a nivel literal.**

Nivel literal: ¿De qué trata el texto? ¿Cuál es la idea principal del texto? ¿Cuáles son los argumentos principales del texto? ¿Qué tipo de texto es? ¿Cuál es el contexto del autor?

Haga una lista con las palabras que no entiende.

2. **Responda de forma concreta las siguientes preguntas (Nivel inferencial)**

Nivel inferencial. ¿cómo está estructurado el texto? ¿Con qué lo puedo relacionar? ¿Qué se puede concluir del texto? ¿Qué otro título se le podía dar al texto?

Haga una lista de palabras clave del texto: (3-5 palabras)Luego, subraye en el texto la parte relacionada a cada palabra.

¿Cuáles son los conceptos que trata el texto? Explíquelos de manera breve y concreta

3. **Responda las siguientes preguntas a modo de párrafos, desarrolle sus ideas. (Nivel crítico)**

¿Qué opino del texto? ¿Es pertinente? ¿Es importante para entender la realidad? ¿Qué aprendí de este texto? ¿Por qué el profesor elgió este texto para la clase?

¿Qué pienso de lo que dice el autor, estoy de acuerdo con su postura? ¿Con qué lo podría complementar?

Note. Translation:
Identity
Read the text: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-05652007000100007
Bauman, identity and community
1. Copy the text to a word file and underline the parts at the literal level.
Literal level: What is the text about? What is the main idea of the text? What are the main arguments of the text? What type of text is it? What is the author's context?
Make a list of the words you don't understand.
2. Answer the following questions concretely (Inferential level)
Inferential level. How is the text structured? What can I relate it to? What can be concluded from the text? What other title could be given to the text?
Make a list of keywords from the text: (3-5 words) Then, underline in the text the part related to each word.
What are the concepts that the text deals with? Explain them briefly and concretely.
3. Answer the following questions in paragraph mode, develop your ideas. (Critical level)
What do I think of the text? Is it relevant? Is it important to understand reality? What did I learn from this text? Why did the teacher choose this text for the class?
What do I think of what the author says, do I agree with his position? What could I complement it with?

In a second example of how the participants address the reading components, INT04 shared the creation of a lesson plan in PDF format about the semiotic of characters for a lesson that was delivered online to the students; the lesson plan outlined several teaching exercises to be resolved by the students (see Artefact 4, Figure 4.8). The lesson starts by explaining to students the key concepts to be learned and the general and specific objectives, in which the critical reading components are differentiated and explained, an approach consistent with the purposeful reading concept described in Section 2.2.3. This is done using a table that describes the expected learning outcomes using the semantic and syntactic components under the label "Text comprehension", which aims at having the students describe the characters and their context.

Figure 4.8

Artefact 3: Sample of a Lesson's Objectives (Semiotic of the World of Characters)

UNIDAD 4: SEMIÓTICA DEL MUNDO DE LOS PERSONAJES

Enunciado de indagación: Los lectores críticos comprenden que los contextos generan cambios en la dinámica entre los individuos con base en sus perspectivas personales, locales y globales.

Concepto Clave: Cambio, Conexión

Conceptos Relacionados: Personaje. Contexto

Contexto Global: Orientación en el tiempo -espacio.

Comprensión textual:	**Estructura interna:** Personajes, acción, tiempo y espacio.	**Gramática, semántica y pragmática:**
• Novela Policiaca Tipología según la importancia. Caracterización de los personajes (descripción) Tiempo de la historia: Contexto y duración	**Producción textual:** Radionovela	Clasificación de las palabras según el acento **Plan lector:** 1. Zombies 2. El escritor asesino

Note. Translation:
UNIT 4: SEMIOTICS OF THE WORLD OF CHARACTERS
Statement of inquiry: Critical readers understand that contexts drive changes in dynamics among individuals based on their personal, local, and global perspectives.
Key Concept: Change, Connection
Related Concepts: Character. Context
Global Context: Orientation in time-space.

Text comprehension: • Police novel Typology according to importance. Characterisation of the characters (description) Story time: Context and duration	Internal structure: Characters, actions, time and space. Written production: Radio soap opera	Grammatic, semantic and pragmatic: Classifying words according to their accentuation. Reading plan: 1. Zombies 2. The murdering writer

To summarise, all the participants interviewed consistently stated "I understand what critical reading is", which describes their belief in being competent in the subject CK, thus providing answers to this study's third research sub-question about the CK competency level of secondary school Spanish literacy teachers in Bogotá. The competence and the hierarchic reading process that students follow and that leads to critical reading was explained by INT02:

> What is critical reading? Well, talking about reading levels, for me, critical reading is above all the correlation that I make of a text and its context, and its pragmatic use. So, I start from the level of literal reading, which is what the text says, what is the sequence of events that narrates me "100 years of solitude", to go to an inferential level of, let's say, identify possible motivations, to identify the code of the text, and the critical level is that correlation that I make between the text and reality, or the text and another record ... the audiovisual or another type of let's say, of cultural phenomena. That is when I take out the text and I can effectively relate it to its environment with a punctual aspect of reality, I feel that achieves the critical level. (INT02)

Regarding the second parent code, *Teaching content*, all the participants discussed following a similar structure to deliver critical reading content, based on a school curriculum that is built on the MOE's Curricular Guidelines for Spanish Language (discussed in Section 2.2.2). The participants provided a view of a historic logic to the teaching of literature and Spanish language, starting with antique Western texts and moving closer to today's context. Under the scope of this research, the secondary school curriculum described by the participants will be explained further. First, at sixth grade, there is an approach to the work of classical European authors through texts adapted for ages 10 to 12. Second, European medieval literature is explored in seventh grade. Third, in eighth grade, Colombian literature is studied; this moves the teaching content away from Europe, with four different oeuvres and authors referenced. The process is continued in ninth grade, where the main scope is Latin American literature, especially a literary movement called the Latin American Boom, which was referred to four times in the interviews. This structure allows the teachers to have a wide variety of content at their disposal, to which they have referred in the interviews using chronicle/s (10 times), novels (4 times), essay (2 times), journalistic articles (2 times), poetry (2 times), and short stories (2 times).

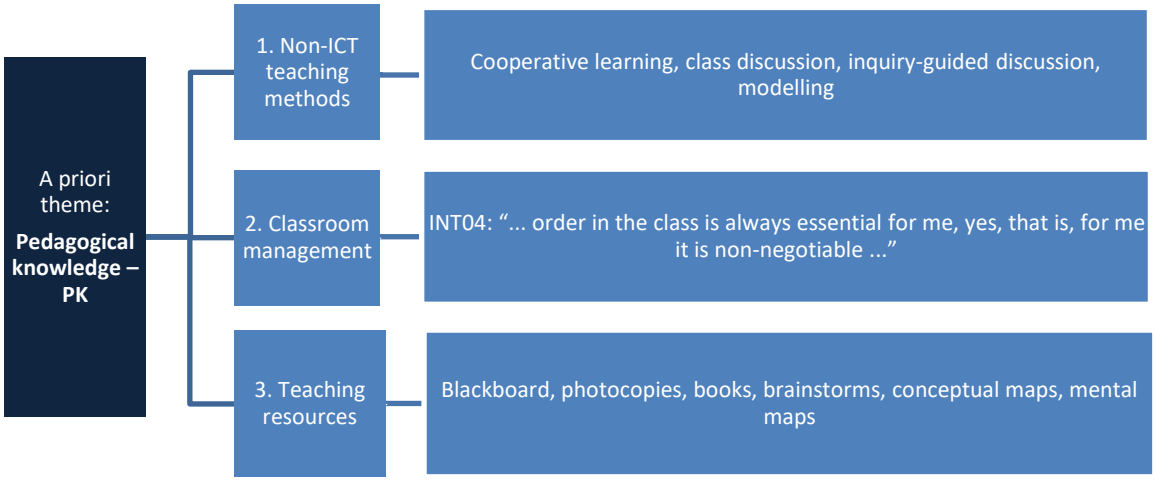
The codes of the a priori theme CK represent how the majority of the participants' CK is strongly rooted in the critical reading parameters discussed in the literature review, where the essential contents are the key components of critical reading like structure, grammar, phonology, and morphology (Section 2.4.1) plus the competencies found in the framework called "National System of Standardized Evaluation of Education" (Section 2.2.2). Therefore, teachers who are competent in the subject CK will more likely be able to integrate it with the other TPACK core knowledges (PK and TK) towards creating learning spaces where teachers can facilitate the learning of critical reading by their students.

4.4 Pedagogical Knowledge – PK

To understand the PK of the participants, they were asked: "Which non-technological methodologies for teaching do you use in your classes regularly?" The answers provided were analysed and grouped into the following parent codes: 1. *Non-ICT teaching methods*, 2. *Classroom management*, and 3. *Teaching resources*. The teachers' responses to questions about PK were coded and then imported into the a priori theme PK. The analysis of these codes addresses the second sub-question: *What is the pedagogical knowledge competency level of secondary school Spanish literacy teachers in Bogotá?* Figure 4.9 presents a summary of the parent codes aligned to PK and extracts from the data to illustrate how the codes were derived.

Figure 4.9

A Priori Theme: Pedagogical Knowledge – PK



Note. ICT = information and communication technologies; INT = interviewee.

The *Non-ICT teaching methods* parent code refers to teaching approaches and pedagogical strategies used by the participants in their critical reading classes that do not require mediation of any ICT tool. From the responses gathered, four teaching strategies were identified in every teacher's practice: cooperative learning, class discussion, inquiry-guided discussion, and modelling. The participants explained their use of inquiry-guided discussion, a form of active learning that uses inductive teaching strategies to help learners construct their own knowledge through problem-solving exercises. INT05 explained how through inquiry-guided discussion, the students use various resources to acquire relevant information and develop their own inquiries, with a scaffolding approach that allows for increasing levels of independence. During an inquiry-guided discussion, the role of the teacher is that of a facilitator, transformed from directing the learning process to becoming a collaborative partner for the students' active-learning process, as described in Section 2.1.2. The following is an extract from INT05's interview, sharing his views on and process for inquiry-guided discussion:

> We generally start from the inquiry cycle, we generally do some explorations about the previous concepts, on the interests of the students, yes? We base ourselves a lot on theorists: So, every two months we make a theoretical line that we are going to follow to address the issues we are working on, for example, when we are analysing a play, a dramatic work, we start from a base text, yes,

> that serves to carry all the analysis that is done on the work that we are going to work on. (INT05)

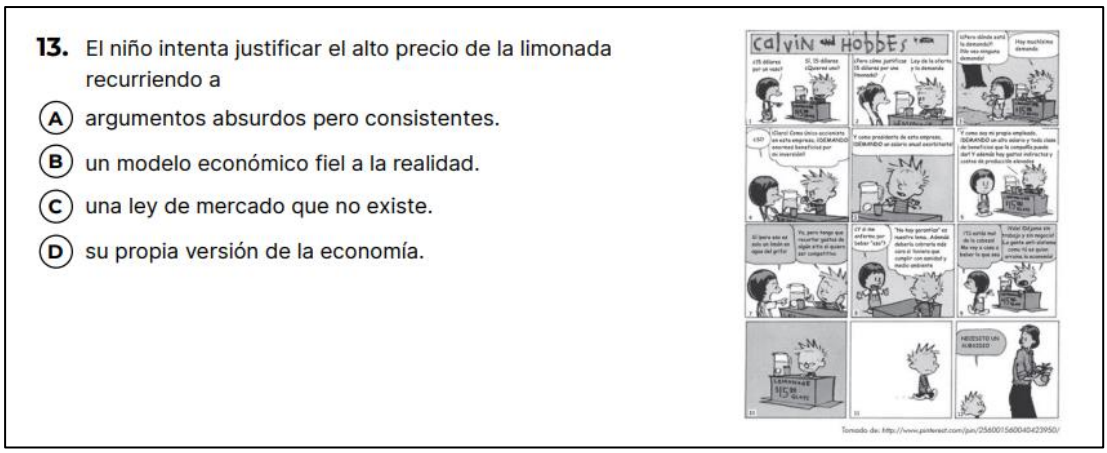
On the other hand, INT04 described how it was important for her to keep the students "connected, that they know what they are doing" and how "order in the class is always essential for me, yes, that is, for me it is non-negotiable ...", and her responses were coded under *Classroom management*. This code groups a series of essential knowledge and strategies used by the teachers to ensure and maintain an organised, productive, and safe learning environment for their students. Effective classroom management involves establishing clear expectations and routines, maintaining a positive and supportive classroom climate, and providing timely and constructive feedback to students. In particular, a key aspect of effective classroom management is creating a positive and supportive classroom climate. This involves building positive relationships with students, promoting a sense of group and community, and providing opportunities for active engagement and collaboration. The participants indicated that they try to establish a positive and supportive classroom climate to create an environment in which students feel safe, respected, and motivated to learn. Another critical aspect of effective classroom management is establishing clear expectations and routines: Participants who establish clear rules and procedures for classroom behaviour and academic tasks are more likely to minimise disruptions and create a focused and productive learning environment. At the same time, clear procedures and routines help students understand what is expected of them, how they should behave, and how they can succeed academically.

The third PK parent code is *Teaching resources*, and it encapsulates the resources used by the participants as part of their day-to-day teaching practice that do not need the mediation through ICT resources. The use of traditional teaching technologies like blackboards, photocopies with different lesson plans and learning guides, books, and activities like brainstorms, conceptual maps, comic strips, and other varieties of materials were referenced by the participants during the interviews to support students' learning of critical reading. For example, INT07 created a lesson using comic strips to discuss and learn about arguments, metaphor, and ironic remarks (see Artefact 5, Figure 4.10), providing the necessary space for students to think critically about the use of such stylistic devices. To appreciate the ICT applications in teaching and learning, it is necessary to first understand the traditional pedagogical

practices used by teachers, such as the abovementioned materials, in order to understand how they migrate their PK into the use of ICT tools and the effectiveness of such endeavours. This will be further elaborated in Chapter 5.

Figure 4.10

Artefact 4: Comic Strip – Teaching Resource



Note. Translation:
13. The kid tries to justify the high price of lemonade by
A. absurd but consistent arguments.
B. an economic model true to reality.
C. a market law that does not exist.
D. his own version of the economy.

Reviewing the participants' responses, it is plausible to conclude there is evidence of their knowledge of different pedagogical strategies to teach critical reading in Spanish language, a result consistent with the research about PK presented in Section 2.2.3. In turn, this allows them to become facilitators (as discussed in Section 2.1.4) by creating different approaches to improve the active learning of each student according to their learning style and pedagogical challenges (as discussed in Section 2.1.2), while maintaining an organised classroom where learning can thrive.

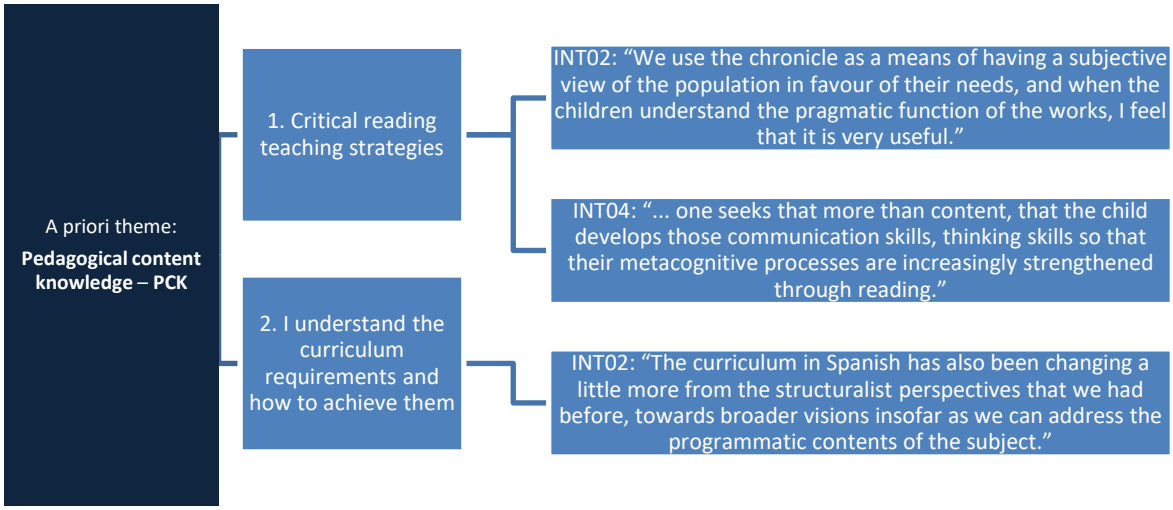
4.5 Pedagogical Content Knowledge – PCK

To learn about the participants' competency in integrating PK and CK meaningfully in the classroom, they were asked questions like "Which non-technological methodologies for teaching do you use to teach critical reading in Spanish language classes?" and "How do your students respond to your use of the particular pedagogies for critical reading?" The interviewees' transcribed responses were coded and aggregated under the a priori theme PCK, with two codes emerging:

1. *Critical reading teaching strategies*, and 2. *Curriculum – I understand the curriculum requirements and how to achieve them*. Figure 4.11 presents a summary of the parent codes aligned to the theme PCK and extracts from the data to illustrate how the codes were derived.

Figure 4.11

A Priori Theme: Pedagogical Content Knowledge – PCK



Note. INT = interviewee.

The *Critical reading teaching strategies* code refers to pedagogical strategies used by the teachers for promoting the abilities of their students to read critically any text, using the reading components explained in Section 2.2.2 and recapped in Section 4.3. Therefore, the *Critical reading teaching strategies* parent code refers to pedagogical strategies behind improving the semantic knowledge and creating pragmatic capabilities depending on the grade level of the students.

One such pedagogical strategy that unites CK as the understanding of critical reading with PK's different pedagogic strategies so "… the child develops those communication skills, thinking skills so that their metacognitive processes are increasingly strengthened through reading" (INT04) is the lesson plan developed by INT04 (Artefact 6, Figure 4.12). In it, INT04 demonstrates several teaching strategies like DGBL to assess reading using Kahoot!, with the class explanation followed by a thinking sequence or the use of collaborative learning to write and record a soap opera. This plan also shares reviews of the different books to be read during the lesson and contains different examples, references, and reading exercises that work on each of the

reading components. The lesson uses a pedagogical approach that builds a better understanding of how to use the semantic and syntactic reading components to create pragmatic understanding of the subject studied by creating several opportunities for the students to read different authors, think about the meaning of the texts, and write about them. The use of a wide variety of teaching strategies is important to cater to the diverse learning styles, preferences, and abilities of students. Furthermore, different teaching strategies can help teachers to assess students' progress and adapt their instruction accordingly. By employing different strategies, teachers can create a positive learning environment that supports the critical reading of their students.

Figure 4.12

Artefact 5: Reading Lesson on Critical Reading Strategies

2	**Abril 26 al 30** Día 6 al 10	Kahoot: Control de lectura del libro: Zombies, Radionovela: las dos comadres Explicación qué es radio y qué es radionovela Lectura: El gato negro de Edgar Allan Poe Rutina de pensamiento	Lectura Zombies Capítulos 15 al 20 Audio Tres minutos
3	**Mayo 3 al 7** Día 1 al 5	Explicación novela policiaca Actividad Alicia a través del espejo Actividad relato y tiempo del relato, personajes, acción y tiempo. Lectura ¿Por qué son fascinantes los relatos policiacos? Redacción de un relato Organización de grupos para trabajo colaborativo Radionovela	Lectura: El escritor asesino. Capítulos 1 al 3

Note. Translation of the third column:
Kahoot: Book Reading Control: Zombies
Radio soap opera: the two wives
Explanation what is radio and what is radio soap opera
Reading: Edgar Allan Poe's The Black Cat
Thinking routine
Police novel explanation
Alice through the looking glass activity
Activity story and time of the story, characters, action and time. Reading Why are detective stories fascinating?
Writing a story

Participants INT02, INT03, INT04, INT05, and INT07 described the use of chronicles, the narrative genre that accounts for historical events. INT05 detailed how the reading and listening of chronicles pushes students to develop thinking skills. First, the process starts with developing an understanding of the syntactic component of the chronicle. Second, it proceeds with the consultation of new sources through reading for contextualising the text with the different sociocultural contexts from the chronicle, which involves investigating the author plus the author's context and associations. The chronicle as a reference material helps contextualisation, creating an opportunity for the students to learn and compare different sources, narrative structures, and types of documents like news articles, scientific papers, and scientific records. This process builds a better understanding of how to use the semantic and syntactic reading components towards a pragmatic understanding of the subject studied. As described by the participants, the approach of using different sources also allows students to understand how critical riding is an ability that goes beyond Spanish language classes by using different reading materials from other subject classes, such as sciences and mathematics. Third, the process is continued in the classroom when the students are taught about different types of argumentative texts with a Canva presentation (see Artefact 7, Figure 4.13), with the aim of developing the capacity to take a critical position by writing about the investigations done about the chronicle, its author, and its context. Finally, the students are tasked with producing their own text using the different critical reading capacities, developing hypotheses and debating with arguments from the ideas previously gathered, thus producing the critical thinking needed to develop pragmatic reading. Although the strategy discussed demonstrates good PCK development, the ICT is mainly used in substituting the blackboard for another presentation, so it shows a low-level integration of TK.

Figure 4.13

Artefact 6: Canva Presentation

Note. Translation:
After reading, reflect:
What does it say?
How does it say it?
What for?

In summary, teachers use chronicles as a medium for students to create a subjective view of their context based on true events, therefore helping them use their semantic reading abilities to traverse through the syntactic and pragmatic reading levels, developing critical reading skills, as described by INT02:

> To be able to take the student to a level of understanding in an applicable and pragmatic context of a knowledge that we are offering through a text. The conceptual maps, for example, the graphic organisers that are very valuable tools that allow the student to achieve that inferential level of decoding the text, of taking it to a critical level, of correlating it in the intentions and correlating it with its function as a cultural product, then conceptual maps, organisation charts in everything that I referred to you about interdisciplinarity, right? They are methodological strategies that we use right now. (INT02)

The second PCK parent code, *I understand the curriculum requirements and how to achieve them*, covers the descriptions given by the teachers of how the curriculum helps them develop their classroom practices. Class development is achieved by building reading plans, guides, and lesson plans that adhere to each school's curriculum, while also following the Colombian critical reading teaching framework discussed in Section

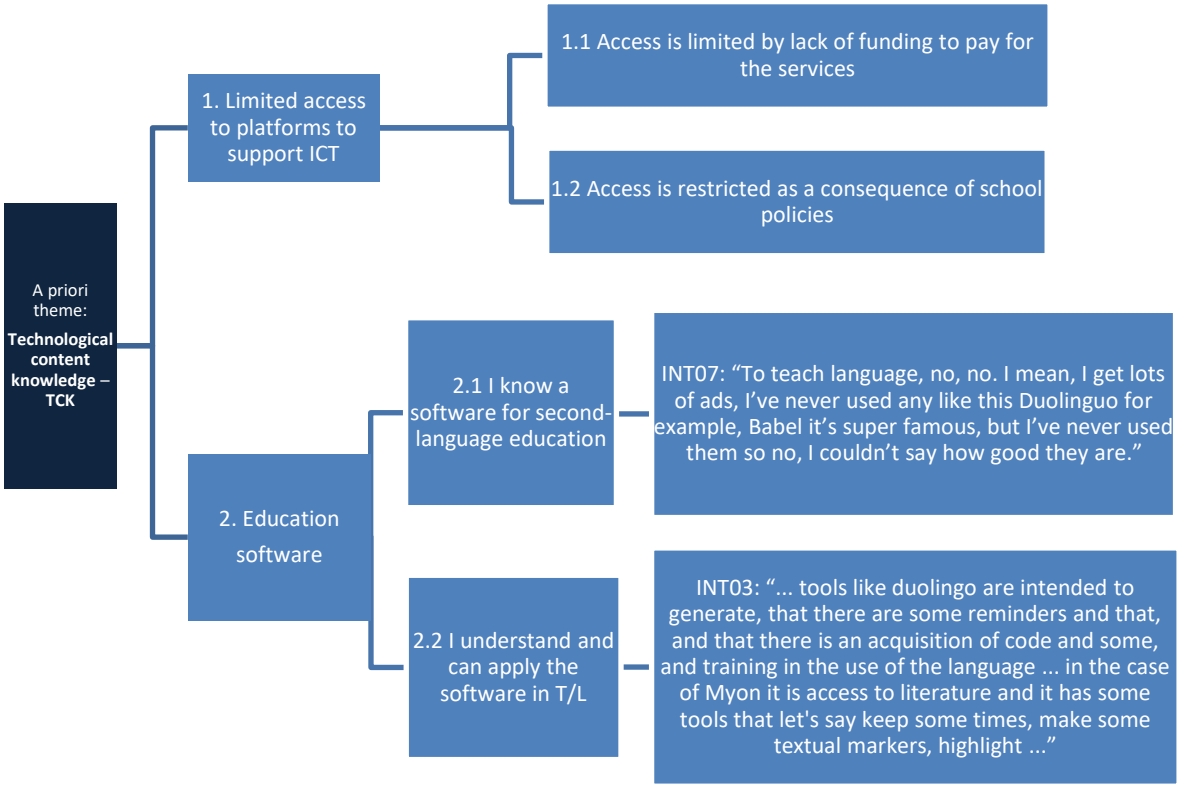
4.3. This code also pertains to how teachers structure their pedagogic knowledge and classwork to accommodate the curriculum, thus supporting its use. As explained by INT02: "… the curriculum in Spanish has also been changing a little more from the structuralist perspectives that we had before, towards broader visions insofar as we can address the programmatic contents of the subject".

4.6 Technological Content Knowledge – TCK

To investigate participants' TCK competency, they were asked three different questions: 1. "What ICT tools and devices do you use in your Spanish language courses?" 2. "Do you know software or tools specific to language education?" and 3. "What are the current and potential barriers you face when using technology in the classroom?" Their responses were coded and aggregated under the a priori theme TCK, and further analysis identified two different parent codes: 1. *Limited access to platforms to support ICT,* which has two child codes, 1.1 *Access is limited by lack of funding to pay for the services* and 1.2 *Access is restricted as a consequence of school policies*; and 2. *Education software*, which has two child codes, 2.1 *I understand and can apply the software in teaching and learning* and 2.2 *I know a software for second-language education*. Figure 4.14 presents a summary of the codes aligned to the theme TCK and extracts from the data to illustrate how the codes were derived.

Figure 4.14

A Priori Theme Technological Content Knowledge – TCK



Note. ICT = information and communication technologies; INT = interviewee; T/L = teaching and learning.

The first parent code for TCK is *Limited access to platforms to support ICT*. Its first child code, *Access is limited by lack of funding to pay for the services*, refers to limited access granted to the teachers due to the school's lack of funds to pay for licences for a particular software, and the difficulties this limited access creates when attempting to generate teaching and learning strategies integrating ICT tools. For example, the teacher may have a determined number of boards, a limited number of interventions, or limited data about how each student uses a software, as indicated by INT06: "You have a limit of collaborative boards, you have a limit of features in Prezi, yes, you have a limit in everything." The second child code encompasses responses where the school policies limit the ICT tools teachers may use on school premises. Such policy limitations are related to websites and apps with blocked access, either for students or teachers, and in consequence, certain classwork practices are either not possible or have to overcome bureaucratic barriers. Among the missing opportunities

described in the interviews are the use of video platforms like Ted and YouTube to watch audiovisual content, or the academic integration of social media platforms to relate current events with learning themes. INT07 shared how "we can't analyse social networks, and social networks are things that are *there*, with a lot of potential, and we cannot work on them, because they are all blocked" by the school policies. On top of that, even some teacher-to-teacher communication barriers were shared, such as the school networks blocking communication apps like WhatsApp, even if the teachers use them to coordinate committees and departments, forcing them to use their personal data plans for work-related communication and activities.

The second parent code shown in Figure 4.14 is *Education software*, and it encompasses all the ideas where teachers described their knowledge about educational software, which are closely related to research sub-question 1: *What is the competency level of secondary school Spanish literacy teachers in Bogotá to integrate ICT to teach critical reading*? To better explain the complexity behind the teachers' knowledge of educational software, two child codes were identified and are further elaborated in the following paragraphs.

The first child code, *I know a software for second-language education*, aggregates the responses provided by participants relating to their knowledge about different second-language learning software like Lingo Kids (INT06) or Duolingo (INT03). It is noteworthy to highlight how the software described is for learning second languages as opposed to learning Spanish, even if the question asked was neutral and about any language-related software. With regard to this point, INT03 shared: "Indeed, we would think of teaching much more in English [language] if you want me to be honest … like myON, like Raz-Kids, well there are those kinds of applications from Duolingo to learn new languages …" Nevertheless, the teachers provided information with regard to the reading learning provided by this type of educational software. Their answers explained how the named platforms focus on the semantic component, and in consequence they only serve to learn about decoding the language.

The second child code for *Education software* is *I understand and can apply the software in teaching and learning*. This child code aggregates the answers where the teachers demonstrate their technical knowledge of a determined software to enhance the critical reading content delivery, foster collaboration among students, and encourage interactive engagement. Within this child code, several teachers discussed

the use of apps like Kahoot! and Quizizz, aimed at improving active learning through the gamification elements previously discussed in Section 2.3.3, Digital Gamed-Based Learning. These apps are particularly chosen by several participants due to their interactivity and gamification and to create guided lessons where audiovisual material and textual references bolster the learning activities, while keeping the students motivated and engaged. In the words of INT06:

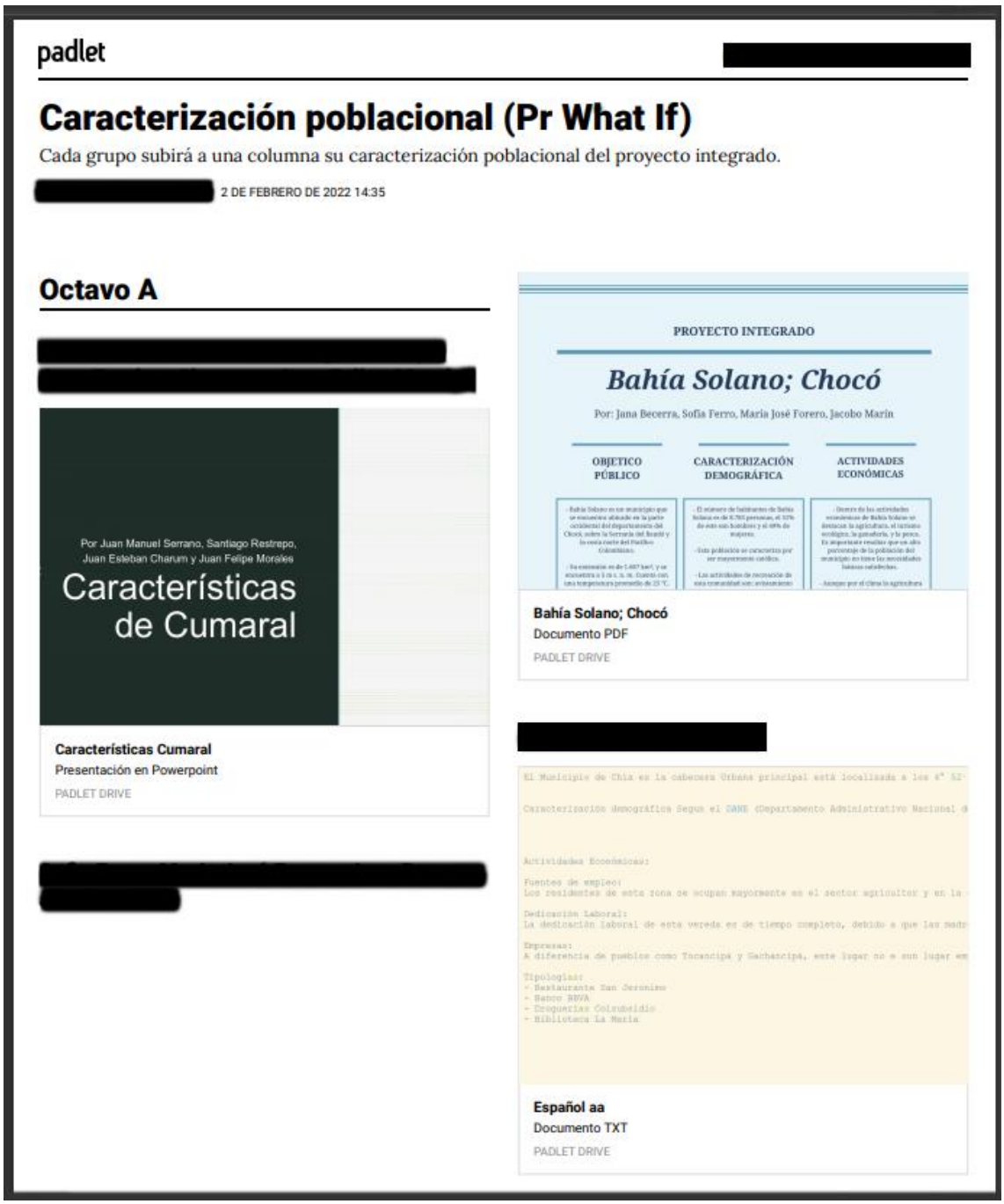
> When you want to do read verification, so you work a Kahoot! and the questions, and well, it motivates them a lot as it is in a competition format, then the Kahoot!, the answer to that question and that helps me a lot. (INT06)

Moreover, web-based software like Prezi or Padlet were mentioned being used to deliver presentations and create class discussion and cooperative learning, as can be seen in Artefact 8 – Padlet wall (Figure 4.15; related to the PK code *Non-ICT teaching methods*). The Padlet platform is designed as a collaborative wall providing improved interactivity and online access, or even hyperlinks so the students can access relevant information more easily, and can be populated with different media inputs, thereby enhancing student engagement and active learning (Nadeem, 2019). Such collaboration and cooperative learning through a Padlet wall is suited for small groups, as the personal feedback takes a lot of time, while the students show high ICT capability demonstrated in the embedding and use of pictures and different types of documents (PDF, TXT, and a PowerPoint presentation) to empower the narrative. Therefore, this pedagogic strategy demonstrates a higher ICT integration level than one of a simple presentation software, as was described by INT02:

> … a very valuable tool that I use a lot is Padlet. It allows me [as a student] to do co-writing exercises, so what I'm doing I do simultaneously with my 10 or 15 classmates and I [the teacher] keep noticing the things they do, the things that work for them, the dead ends they sometimes reach in their own writing, and I feel that it has been a huge leap that I still use with face to face, because that allows the student to identify strategies and allows the student to find different paths in his own writing, which is also a labyrinth. So, in that sense, technology provides us with certain tools that allow us to enhance the levels of comprehension and written production. (INT02)

Figure 4.15

Artefact 7: Padlet Wall



Note. Translation: Population characterisation (Pr [Project] What If)
Each group will upload to one column their population characterisation of the integrated project.

A second example of such use of ICT to improve the delivery and interactivity of CK is the use of audio aids shared by INT05 and INT06. Such resources allow the participants to share with students the work of authors through the voice of the authors themselves, which allows for a deeper contextual knowledge of the subject, and the

digital technologies provide easier access to such content (see Artefact 9, Figure 4.16). On top of that, INT05 also shared how he uses other platforms like Spotify and RTVC[2] to share new content from different latitudes like Spanish-speaking communities in the USA or small rural parts of Colombia, where the use of the Spanish language has different dialects and accents. These accents would be extremely difficult to share without the use of technology, and the pedagogic use derived from them will be further discussed in Section 4.8.

Figure 4.16

Artefact 8: YouTube Video: The Author Reads Himself

Although the participants discussed finding certain difficulties in accessing all the software they would prefer, through the current use of the platforms available to them, they have managed to create relevant teaching opportunities that successfully help deliver the teaching and learning of critical reading content and evaluations. Furthermore, the participants agreed that some of these strategies create learning experiences that cannot be created without the mediation of ICT tools. The fact that the teachers have a high concept of the ICT resources and of the results achieved,

[2] RTVC or Sistema de Medios Públicos (Public Media System) is a public radio and television entity of Colombia.

provides a reason why secondary school teachers in Bogotá DC use ICT tools as part of their lesson plans for critical reading. Nonetheless, not every strategy and artefact shared by the participants has a high level of TPACK integration, since some of the artefacts received lack the rigour of other strategies that may be possible when using ICT beyond the convenience of presenting and delivering content. Consequently, the use of an ICT tool like the Padlet in Artefact 8, although an interesting functional improvement over traditional media like the blackboard, still presents characteristics such as a heavy focus on the text, low interactivity (browsing mainly), partial use of audiovisual aids, and especially a low use or no use of links to further reading, and thus it fails to use the full potential of technology to create new teaching strategies. As stated before, all the participants supported the use of ICT to teach in their Spanish critical reading activities, stating plainly their use of interactive tools, different presentation software, and other audiovisual aids, yet the artefacts received still show low integration of ICT. It is noteworthy to relate artefact 8 with an answer where the participant, INT03, takes a very different stand to the examples provided:

> But sometimes I make interactive tools, that they have to interact with some, some flash program or similar that has interactivity to talk about class topics. Of course, there are a lot of video tools that I use, let's say Ted, YouTube, let's say I download the videos because the program is not open at school, well the page. I am mainly working with Canva for graphic themes, sometimes the guys use other proposals, they used some other programs for mind maps, that type of data hierarchy and graphic work tools and mainly those, maybe I have left some out ... (INT03)

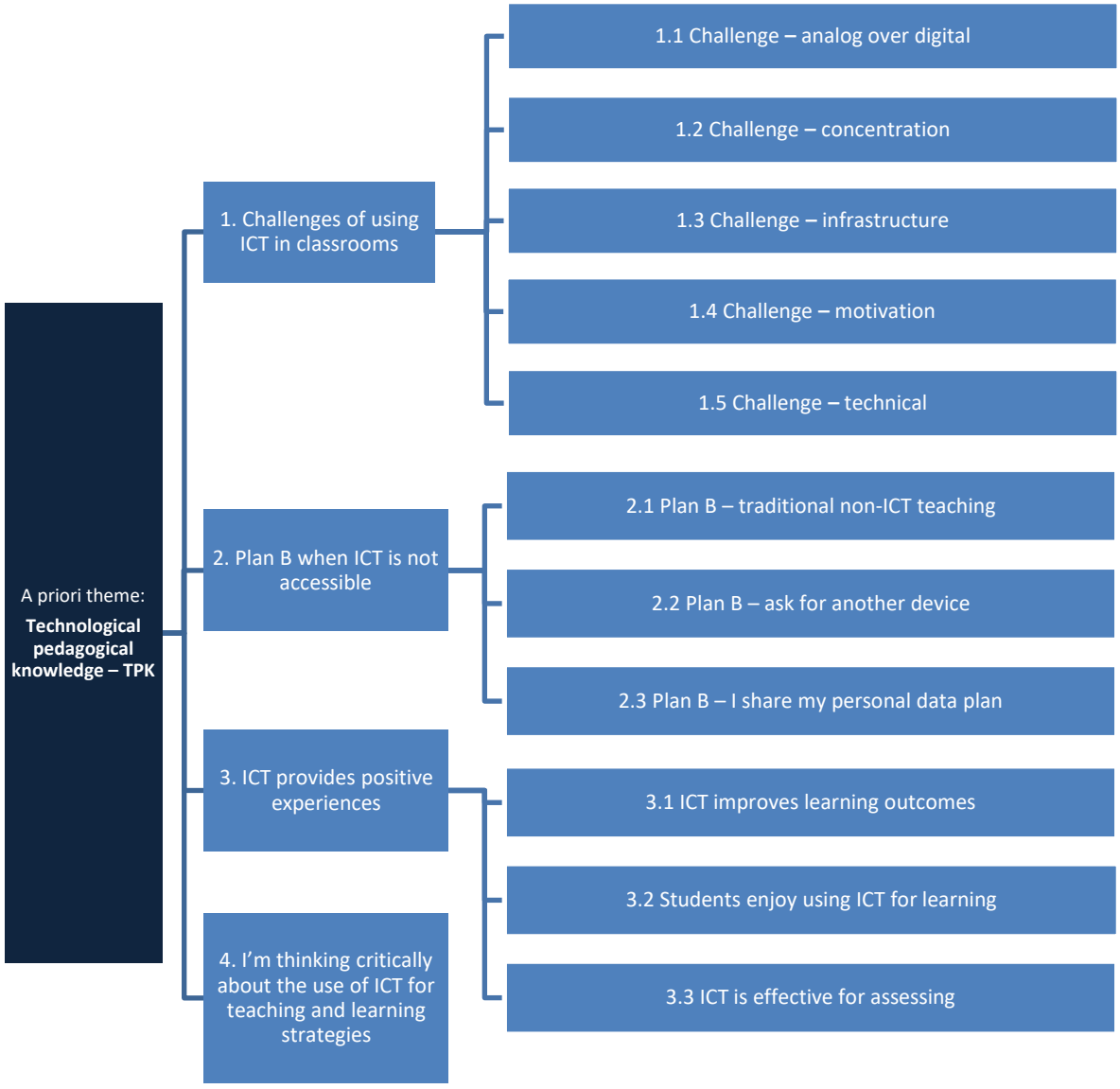
4.7 Technological Pedagogical Knowledge – TPK

To learn about teachers' TPK, two different questions were designed: 1. "Can you please tell me about your views for using technology with your students?" and 2. "What strategies do you use to overcome these barriers?" (This was a follow-up to the TCK question, "What are the current and potential barriers you face when using technology in the classroom?") The participants' responses to these questions were coded and imported into the a priori theme TPK, with further analysis identifying four parent codes: 1. *Challenges of using ICT in classrooms*, which holds five child codes obtained from different types of challenges described by the teachers: 1.1 *Challenge – analog over digital*, 1.2 *Challenge – concentration*, 1.3 *Challenge – infrastructure*, 1.4 *Challenge – motivation*, and 1.5 *Challenge – technical*. The second parent code is

2. *Plan B when ICT is not accessible*, and it holds three child codes: 2.1 *Plan B – traditional non-ICT teaching*, 2.2 *Plan B – ask for another device*, and 2.3 *Plan B – I share my personal data plan*. The third parent code is 3. *ICT provides positive experiences*, which has three child codes embedded: 3.1 *ICT improves learning outcomes*, 3.2 *Students enjoy using ICT for learning*, and 3.3 *ICT is effective for assessing*. The fourth parent code under TPK is 4. *I'm thinking critically about the use of ICT for teaching and learning strategies*. These parent and child codes are presented in Figure 4.17.

Figure 4.17

A Priori Theme: Technologic Pedagogical Knowledge – TPK



Note. ICT = information and communication technologies.

The first parent code, *Challenges of using ICT in classrooms*, covers the challenges that are rooted in the intersection between TK and PK. Five main themes were discovered after carefully analysing the interview data, which were then coded as child codes. The first child code, *Challenge – analog over digital*, collects ideas about how teaching without using ICT tools provides benefits. INT02, INT07, and INT09 described their beliefs about how reading from a physical book provides certain advantages for the students like ubiquity, the lack of need for electricity for reading, and the ease of access to different parts of the same book at the same time by flipping back. The second child code is *Challenge – concentration* and was the most repeated challenge by the participants, where they described the difficulties of managing the students' concentration in lessons when they have access to other activities in the same hardware they use to study (or in other hardware they have access to at the same time), either at school or in the students' homes. The participants described how some of these other activities like video games and browsing social media or multimedia platforms might be seen as more interesting by the students. The third child code is *Challenge – infrastructure*, and it collects the challenges derived from device and connectivity issues, for example, if the internet connection fails (five references) or the video beam lacks clarity, leading to difficulty in delivering a class exercise due to poor readability of the pedagogical content. The fourth child code, *Challenge – motivation*, has only two references, but it presents an interesting negative consequence after the COVID-19 pandemic: The students found themselves exhausted from using ICT to learn in some of INT05's classes, leading them to "repeatedly ask that we work outdoors, that, no longer screen". Finally, the fifth and last child code is *Challenge – technical*, and it collects the different sets of technical challenges that the teachers recalled from their teaching experience and that are only possible due to the use of ICT in their classes. For instance, INT05 found that since students' main use of their writing skills is for social media texting and web-chatting services, they lack the practice and experience in writing and the ability to differentiate between academic or formal writing and their day-to-day approach. Similarly, participants INT02 and INT07 both agreed about how writing on a laptop with autocorrect leads to students losing writing skills like orthography, punctuation, and planning written paragraphs.

The second parent code of the a priori theme TPK is *Plan B when ICT is not accessible*, and it covers the solutions proposed by the teachers when infrastructure

fails, and they perceive being left without ICT to teach. As shown in Figure 4.17, the first child code for this parent code is *Plan B – traditional non-ICT teaching* and refers to the flexibility described by the participants to adapt and improvise new teaching strategies when forced to leave behind the ICT pedagogic strategies: "So we go back to the book, we go back to what we say is analogical and we work based on what we have, designing an activity in which we can do work, either individually or in a group", as told by INT05. Although this is not a common solution, when the teachers face a full disconnection from web services, they have the capacity to create paper-based, traditional, non-ICT teaching strategies that maintain the intended teaching outcomes. If necessary, the teachers can choose to do an improvised paper-based activity with photocopies and notebooks, always looking to create learning opportunities.

The second child code for this parent code, *Plan B – ask for another device*, answers to the occasions when the infrastructure fails for some students, in which case the participants have found that the best way to avoid disrupting the whole proposed ICT activity is to bring replacement devices from the school supply. Such an approach is only possible in the schools that have an infrastructure strong enough to have "spare devices", and thus it would be restricted in many publicly funded schools. Finally, the third child code, *Plan B – I share my personal data plan*, relates to a resource used by teachers when there are available devices to be used by their students, but connectivity is partial or non-existent. At such times, teachers described how they would rather share their personal data plan instead of going back to non-ICT teaching strategies, since the benefits provided by using them outweigh the costs and difficulties of using their personal data plan. This provides an example of the interest and commitment of the participants to using ICT strategies even at personal expense to keep the learning strategy ongoing.

The third parent code of TPK is *ICT provides positive experiences*, and it encompasses the positive perception of the participants regarding the integration of ICT tools in their pedagogical strategies to teach critical reading. Such positive sentiments towards using ICT are consequent to the participants' competitiveness with PK and TK as described in each respective category's discussion above. When aggregated into TPK, such positive perceptions serve as arguments to why secondary school Spanish literacy teachers in Bogotá use ICT as part of their lesson plans for

critical reading. The richness of the data collected resulted in three child codes being identified for this parent code, as shown in Figure 4.17.

The first child code is *ICT improves learning outcomes*, and it relates to when the participants described their students' learning being enhanced through the use of ICT tools. INT02 explained this by sharing how, when he uses the software Padlet (Artefact 8, Figure 4.15) to create pedagogical strategies for cooperative learning and guided discussion learning scenarios, the lessons are richer. Platforms like Padlet "works a lot" (INT02) towards improving critical reading abilities because the students can discuss their thoughts while reading every other student's approach to the same subject, and on top of that, the teacher can embed an array of support content like hyperlinks to videos, audio files, or news that the students are free to use depending on their needs and interests.

The second child code under the third parent code is *Students enjoy using ICT for learning*, which describes the positive feedback received from the participants' students regarding the use of ICT-mediated pedagogic strategies. The responses are consistent with the research presented in Section 2.3.3 about the use of DGBL to improve student motivation and learning outcomes; in the words of INT06:

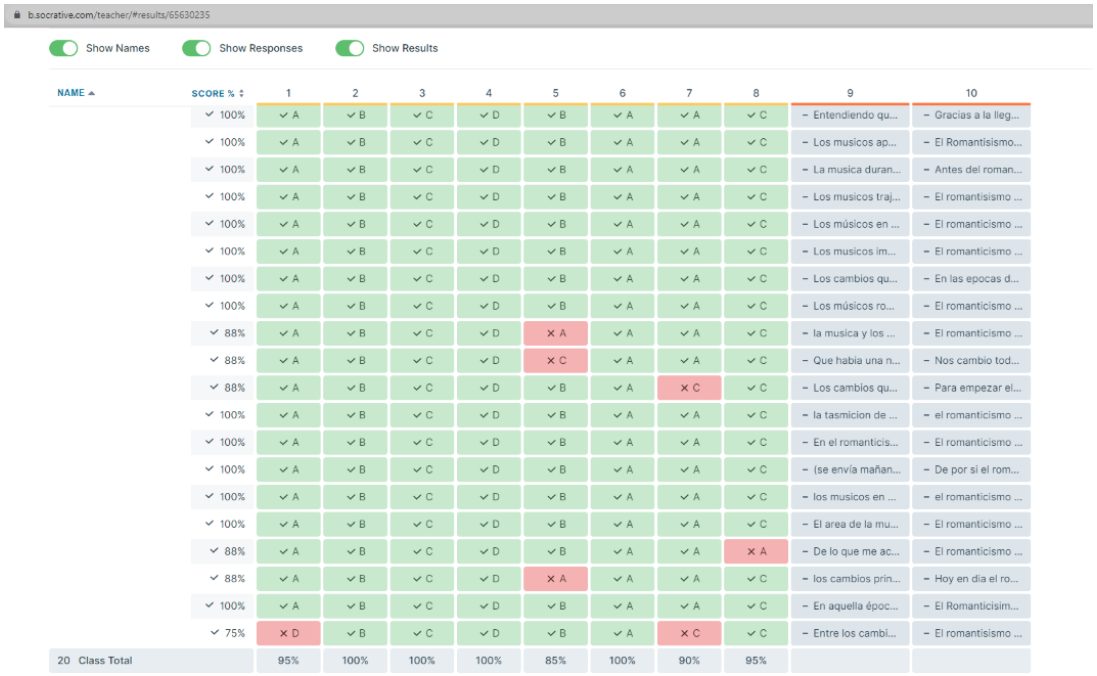
> The construction of knowledge becomes more dynamic, and they feel more involved because they feel that they are being spoken to in their language, to the extent that technology is involved, and therefore things are done that are closer to them. (INT06)

The third child code under the third parent code is *ICT is effective for assessing*, and it covers the references to how using ICT helps teachers get a better and faster understanding of the critical reading expertise of each student. The quality for assessing provided by ICT tools is another reason why the participants use them as part of their Spanish literacy lesson plans for critical reading, as explained by INT02: "[ICT] provides some very interesting tools for understanding the text, both for students and for the teacher." One of the ICT tools described by INT02 is myON, an educational platform that allows the teacher to follow student metrics such as reading time, number of pages read, and vocabulary growth for any given text. With this data, INT02 noted that they could follow each student's reading process, learning through myON how much time each student reads, and "it also allows us to identify the types of reading where, let's say, the students have more difficulties when it comes to understanding". This level of

interaction between teacher, platform, and student is highly notable, since the platform tracks and records each student's metrics, and teachers can then identify areas where their students need additional support and can track progress over time. myON also provides a range of tools and resources that can help teachers assess their students' comprehension of the materials they are reading. For example, the platform includes quizzes and assessments that can be used to evaluate students' understanding of the content they have read. Finally, INT03 provided evidence of the benefits that ICT tools provide for secondary school Spanish literacy teachers for their administrative duties (see Artefact 10, Figure 4.18). The example provided shows how ICT is effective for grading as well as assessing, which eases the participants' workload and provides more reasons for them to choose to use them.

Figure 4.18

Artefact 9: Grading Example in Socrative



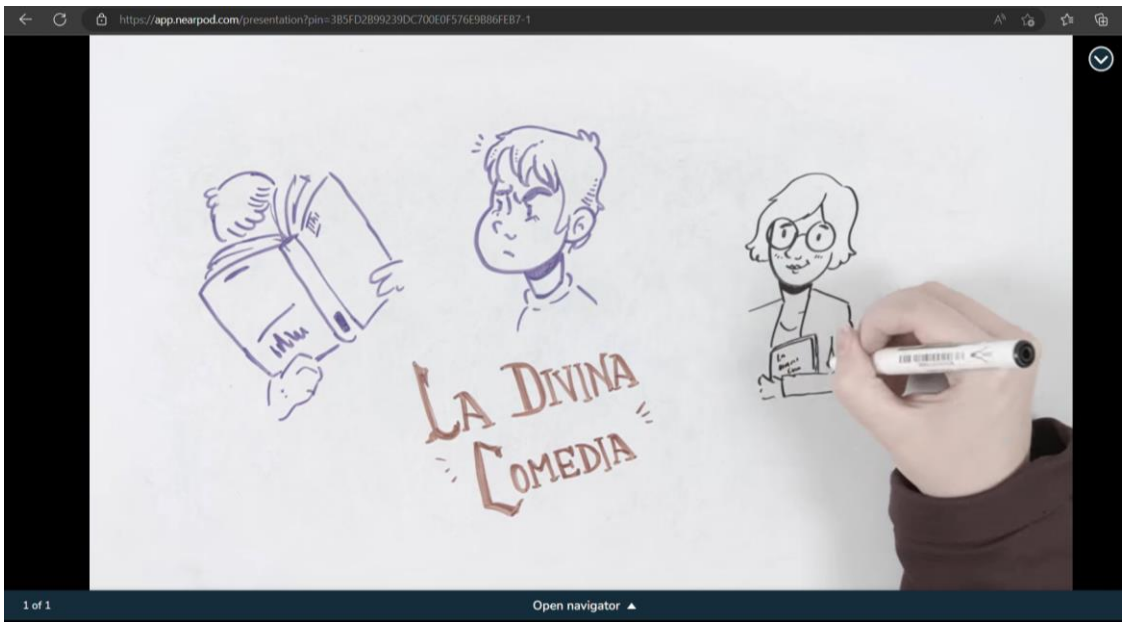
Nevertheless, even though teachers agree that ICT is good for assessing, artefacts like Artefact 3 referred to in Section 4.3 on CK only share a portion of the positive pedagogic characteristics stated above. Such artefacts are class lessons whose only ICT integration is through the delivery method or minimal links to texts; they consist of either a word or PDF document that does not even have links or hyperlinks to different learning materials to enhance the learning experience. These types of

documents represent the use of traditional tools to deliver lessons without the integration of higher-level technology or strategies. Thus, the level of ICT integration in these activities is low, with a basic presentation of content using word processing software, with no significant interactivity or the use of different kinds of media (digital or analog), or with limited peer collaboration. Such lack of interactivity indicates a low integration of TPK by the teachers, and it results in the possible minimal engagement by students with the critical reading content.

Finally, the fourth parent code, *I'm thinking critically about the use of ICT for teaching and learning strategies*, captures evidence to illustrate teachers' self-criticism and deep reflection about their own use of ICT tools for pedagogy. It is noteworthy that the participants not only employ various ICT tools, but they also share the adoption of a critical approach in the selection of the most appropriate ICT tool that aligns with the intended content and the teaching approaches. For example, INT07 described that a quick and short assessment or class wrap-up can be done using Kahoot! thanks to the quick nature of this ICT instrument. On the other hand, an ICT tool like the Nearpod platform provides INT07 with a better quality assessment thanks to the software's more complex tools. Nearpod is an interactive educational platform that enables teachers to create and deliver multimedia-rich lessons to students. It also offers real-time assessment tools that enable teachers to test students' comprehension of the material as it is being presented via multiple-choice questions, providing immediate feedback and allowing for adjustment of teaching strategies. The platform also allows teachers to create interactive assignments that can be completed by students outside of class, providing additional opportunities for assessment and evaluation. In a Nearpod lesson like the one depicted in Artefact 11 (Figure 4.19), INT07 created a pedagogical strategy where students follow a video lesson about The Divine Comedy; in certain parts, the video stops and presents a question about the content presented, and the video continues once the question has been answered. Finally, INT07 conducts a short gradable quiz after the whole video has been watched.

Figure 4.19

Artefact 10: Nearpod – The Divine Comedy Title Screen



In summary, the TPK responses describe how the participants face several challenges, from technical problems to more intricate and pedagogy-driven challenges, which ultimately do not keep them from using ICT tools and from helping their students learn. At the same time, the positive characteristics that the ICT tools for secondary school Spanish literacy teachers, both for teaching critical reading and for their administrative duties, offer positive evidence about why the participants choose and use the tools coded.

4.8 Technological Pedagogical Content Knowledge – TPACK

The previous individually discussed TPACK factors converge to provide a holistic understanding of how Spanish literacy teachers approach ICT applications in their teaching and learning activities. To understand the depth of the teachers' TPACK competency, responses from the following four semi-structured interview questions were analysed: 1. "In what ways do you use any of these ICT tools and devices in your Spanish language instruction?"; 2. "How do you define computer-based language education? What is the meaning of this concept for you? Please explain it"; 3. "Do you feel that you are able to combine your pedagogical knowledge, content knowledge, and technological skills to effectively integrate technology into teaching?"; and 4. "What is the difference between teaching with ICT tools and teaching without

them?" Collectively, these questions can provide a holistic understanding of Spanish teachers' ICT-inspired practices by addressing various aspects of their professional practices. The first question asks about the specific ways in which teachers use ICT tools and devices in their Spanish language instruction, providing insights into participants' technological skills and knowledge. The second question probes teachers' conceptualisation of computer-based language education, providing insights into their CK and understanding of how technology can be integrated into language teaching. The third question asks about teachers' ability to effectively combine their PK, CK, and TK to integrate technology into their teaching, providing insights into their TPACK competency. The fourth question asks teachers to reflect on the differences between teaching with and without ICT tools, providing insights into how they perceive the impact of technology on their teaching practices. Collectively, these questions provide a comprehensive picture of teachers' TPACK competency by addressing the various components that make up this framework.

The three codes that help collecting the participants responses to the above questions have been created by aggregating the data gathered from the codes found in the previous seven sections. This supports the need for convergence as opposed to yet again creating new codes, as the TPACK section is created by the juxtaposition of the seven knowledges previously discussed. These three parent codes encompassing the holistic understandings are: 1. *I can learn more about using ICT for critical reading education,* 2. *I can use ICT that enhances teaching and learning critical reading in my teaching,* and 3. *I can create teaching strategies at a high level of ICT integration*. Figure 4.20 presents a summary of the codes aligned to the theme TPACK and extracts from the data to illustrate how the codes were derived.

Figure 4.20

A Priori Theme: TPACK

The first presented code in Figure 4.20 is *I can learn more about using ICT for critical reading education.* This parent code captures participants' self-criticism with regard to the limits of their own ICT knowledge and the acknowledgement that there is a need to improve their individual competencies towards creating better ICT-mediated strategies to promote the learning of critical reading in secondary school students. The reasons surrounding this self-criticism are, first, the changing nature of technology and how it makes TCK quickly obsolete or out-of-date, as discussed in Section 2.3, ICT; and second, the lack of proper policies and opportunities to learn and experiment with different ICT tools and strategies in a safe environment that procures all the goods needed for the participants to learn, as discussed in Section 1.4, ICT, Education and Its Integration. The above is evidenced in INT08's observation: "And the ignorance of the platforms, well you know, no, I have not investigated more? I

think that this is also my problem, as I have not investigated more about, about if there are those platforms that allow me to develop reading skills."

The second parent code of the a priori theme TPACK is *I can use ICT to enhance teaching and learning critical reading*, and it corresponds to the blended use of the different teaching methods and resources found in Section 4.4 (PK) with the software coded in Section 4.2 (TK) to teach critical reading. The apps and software are used for redesigning traditional teaching strategies by bringing ICT into different parts of the teaching strategy; therefore, these new approaches correspond to a high level of integration between knowledges. These multimedia approaches to teaching the content, where variable media software are used to enhance the learners' experience, provide the students with different learning paths and choices, encouraging interaction and collaboration with peers. It is relevant to recognise how the teachers have attained certain experience and comfort using ICT tools for creating this level of integration, not only from the PCK but also in TPK to choose the best teaching strategies and the ICT tools to integrate.

One of the examples from the artefacts collected for the code *I can use ICT to enhance teaching and learning critical reading* comes from INT07, who uses the app Nearpod, an online instructional software, to create interactive teaching content for critical reading using the blended-learning strategy, which was previously documented in Section 2.3.2. First, INT07 used programmed learning (pedagogical strategy) through the Nearpod platform (technology) to provide the students with an online multimedia learning video for critical reading (content; see Artefact 11, Figure 4.19). Nearpod allowed INT07 to upload a previously selected video and to lead the rhythm of the learning by activating mandatory pauses in the parts of the video where better scaffolding could be provided towards developing critical thinking strategies. In these pauses, INT07 used his PCK to either provide further written examples and links or to create questions to delve into the knowledge found in the previous parts of the video (as seen in Artefact 12, Figure 4.21), thus activating students' prior knowledge of the subject matter, a good strategy for developing critical reading, as discussed in Section 2.2.2. This strategy offers several benefits to the students. First, it allows them to learn at their own pace, since they can rewind the video and search for answers to the questions that emerge through their curiosity and the questions provided by the teacher; second, the students have time to visit other learning sources for the same

content if they need it; lastly, it allows them to take pauses. Afterwards, INT07 created a new teacher-led activity that served to reinforce the content in a face-to-face setting, building from the benefits found in the app:

> So, Nearpod is very good for that because it pauses you, well, you design it for that. You can, you can put questions throughout the video that arise from what was just said in the video itself, that can't be done even in Kahoot!, not even in Socrative, and it seems to me that it is good because, as the student watches, he takes notes, eh, and when the question comes up, well, he was attentive, because he knows how to answer, so it is a little more "immediate". (INT07)

Figure 4.21

Artefact 11: Nearpod – The Divine Comedy – Multiple-Choice Question

Note. Translation:
What does the sun represent in the Divine Comedy?
A. The difficulties of life
B. God
C. The author
D. Happiness

Finally, the third TPACK parent code, *I can create teaching strategies at a high level of ICT integration*, refers to the answers provided by the teachers where they established creating teaching strategies using ICT tools at a high level of integration between TK, PK, and CK. Such level of integration between the TPACK knowledges represents the highest expected knowledge integration, with teachers capable of using different practices to teach critical reading (PCK), knowing how the digital tools

available to them enhance and transform learning critical reading, its delivery and interaction with the students (TCK), and using these tools as a vehicle for the intended active-learning outcomes (TPK), ultimately creating innovative and technologically enhanced strategies and activities that provide their students with rich learning experiences, as discussed in Section 2.4, Convergence for Learning.

One of the teaching strategies that corresponds with this category is the radio soap opera lesson described by INT05 as part of his critical reading strategies, called *Soap opera for critical reading*. First, INT05 used his TCK through different auditory references found in different Colombian and US web radio channels and podcasts. Through this audio material, INT05 introduced students to the Spanish language particularities of different contexts to "raise awareness of the importance of the language and the diversity that exists", as previously described in Section 4.6. Second, having explored these contextual particularities, INT05 proposed a collaborative learning strategy to use this knowledge (an approach consistent with the relevance of the social interaction for active learning discussed in Section 2.1.3 and 2.2.3): In this activity, the students were tasked initially with carefully reading and studying the narrative structure of a novel, which was also complemented with other theoretical references provided by INT05. Afterwards, the learning achieved from the reading exercise plus previous knowledge was used to collaboratively write a script for a radio soap opera. The script developed by each group of students for a radio soap opera was then played out and recorded in their houses during the COVID-19 restrictions. Each group created a final version of each soap opera by editing using the Anchor app, with the results uploaded online on a Spotify channel organised by the teacher (see Artefact 13, Figure 4.22). Finally, once these recordings were uploaded, the groups could hear and discuss each other's productions. The objective established by INT05 for this activity was to develop the narrative skills of the students, allowing them to write a cohesive story using a basic structure of beginning, middle, and end with the correct characterisation of each character depending on their given context.

Figure 4.22

Artefact 12: Literary Café, a High Level of ICT Integration – TPACK

Note. Translation:
Sixth (grade) literary café
Radio soap operas 6th B

PCK is present in this strategy as INT05 uses characterisation and narrative structure to develop critical thinking. Characterisation – the creation of a fictional character – develops the students' critical thinking of how a given context creates certain circumstances that change the agency of people, in this case, each of the characters they are creating for the soap opera. Narrative structure refers to the organisation and arrangement of events, actions, and information within a narrative or story. It provides a framework for how the story is presented, including its beginning, middle, and end, as well as the relationships and connections between the characters, their context, and the nature of the different elements. Narrative structure helps to shape the flow, coherence, and meaning of a narrative, allowing the audience or reader to engage with and comprehend the story more effectively.

A pedagogical strategy such as *Soap opera for critical reading* demonstrates a high use of ICT integration by the participant and students to support the teaching and learning process. As mentioned by INT05, he used audio from different parts of the world and different time periods to provide the students with evidence of the difference in accents in speech, depending on these different contexts. INT05 used several texts and reading aids, both evidencing a well-developed PCK. This knowledge was integrated with technology when INT05 asked the students to make a radio soap opera, content that could have been done with non-digital technology, but that was impossible

to do synchronously from different places (even more so under the prohibitions during COVID-19), and this auditory element was shared among all students in a podcast channel on Spotify after being edited in Anchor and recorded with ICT devices. Such combination of online tools with traditional face-to-face teaching constitutes the practice of blended learning described in Section 2.3.2, where it was explained how this strategy serves to blend – or integrate – ICT teaching with physical teaching, ultimately creating an innovative learning strategy through technologically enhanced activities that provided students with a varied and active learning experience.

4.9 Summary

The codes for the a priori theme TPACK show a wide range of ICT tools, teaching strategies, and procedures used by the participant teachers in private schools at Bogotá DC. It must be noted that the responses provide evidence that the schools selected may be in the second level on the digital divide that was discussed and illustrated in Section 2.3 (see Figure 2.1). This level states that the schools have gone beyond the first level, "access", by surpassing basic infrastructure problems, thus allowing access and support to all teachers and students. Therefore, these schools find themselves in the second level, which focuses on the "use", where the teachers need support and satisfactory professional training to successfully integrate ICT. This explains how the teachers can have a position where they feel they need to do more research on ICT and strategies to use in their teaching, while understanding the importance and relevance of bringing such ICT tools and strategies to their classrooms (code *I can learn more about using ICT for critical reading education*).

Finally, the overall analysis reveals how some participants have reached a high integration level of technology in their pedagogical strategies, redesigning them significantly with the use of ICT tools (INT02, INT03, INT05 and INT07). This integration of technology into teaching strategies indicates that such strategies are not possible without the technological component, as presented in the strategy by INT07. Furthermore, INT02 also discussed a high level of ICT integration in his teaching activities: This participant discussed co-writing exercises using the Padlet platform, a new strategy that could not be accomplished without the use of ICT tools. The ICT tool Padlet is pivotal for allowing students to watch and review in real time multiple writing exercises while performing their own. It illustrates how "… technology offers

us this type of tools like the one I named you, let's say for what I'm telling you, to enhance those writing processes, of student comprehension", as expressed by INT02.

The evidence for TK, PK, and CK demonstrates that there is a strong base knowledge and that in most of the participants, this knowledge translates into some integration of TCK, PCK, and TPK knowledge. However, not all the participants had the same fluency in integrating ICT into their pedagogical strategies, despite the fact that all said they find it important and relevant to integrate digital technologies in their professional practices. The evidence shows that different types of strategies are used, and different software is used for each of these strategies, which corresponds to the responses collected. However, and as demonstrated by the artefacts collected, not all of these strategies agree with the parameters described during the interviews, since some of the artefacts demonstrate the use of ICT only to replace the use of paper, without taking advantage of the benefits of having an infrastructure with strong and acceptable connectivity in most cases (INT04 and INT09). It is also relevant to highlight the interest of all the teachers in using backup strategies when connectivity or infrastructure fails, as discussed in Section 4.7.

The following chapter will delve into a comprehensive discussion of the findings, exploring the literature that discusses the outcomes and where I interpret and analyse all research findings in the context of existing literature and of the TPACK theoretical framework.

Chapter 5: Discussion

The main aim of this study was to determine how Spanish literacy teachers serving selected private schools in Bogotá are using ICT for improving critical literacy competencies of secondary school students, using the TPACK conceptual framework. This chapter discusses the findings and the literature that supports and contradicts them. First, Section 5.1 recaps the most relevant information related to the findings from the literature review in Chapter 2. Since one of the major findings is the progressive development nature of ICT integration skills, three different levels of integration are then discussed: Section 5.2 presents discussion on the basic integration level, Section 5.3 presents the intermediate level, and Section 5.4 discusses the high integration level. Finally, Section 5.5 will use the findings to highlight the importance of professional development for teachers to enhance their TPACK with the ultimate aim of improving the quality of their teaching practices and positively impacting student learning outcomes.

5.1 Situating the Key Findings Related to ICT Integration

In today's digital landscape, integrating technology into education has become increasingly important (Koehler et al., 2013). However, despite the recognition of the significance and value of integrating digital technology in education, not all teachers identify its value or possess a level of understanding on how to apply the different sets of knowledge captured in the TPACK to improve teaching effectively in their classrooms (Saltan & Arslan, 2017). This study's findings are influenced by purposive sampling, which acknowledges that teachers in IB schools have strong teaching foundations because they are selected through a rigorous process in which professional competence is a key criterion. The teachers have high competencies in PK, CK, and PCK related to Spanish literacy teaching. Consequently, they demonstrate a high level of understanding of the best practices for teaching Spanish literacy due to their professional development opportunities in the IB system. The key difference identified in this study lies in the teachers' ability and knowledge to integrate ICT tools into their teaching strategies. Although the participants claimed to have high capacity for integrating technology in their teaching and learning practices, this claim was not

entirely supported when examining related artefacts. Recognising the teachers' well-developed PCK, the integration levels that will be discussed in this chapter are differentiated through the complexity of the pedagogic strategies used and how the integration of ICT tools improves each strategy. The discussion will elaborate on how teachers use their PK, CK, and PCK to integrate ICT in their classroom practices. Unlike other ICT integration research in developing countries, these levels of integration contemplate the reality of a stable infrastructure among the schools where the integration occurs, given the privileged nature of the selected schools.

Three levels will be described depending on how deep the correlation is between the participants' TK and PCK: basic integration, intermediate integration, and high integration (see Table 5.1). The first level is a basic-level ICT integration, which was found among all the participants, where the main use of ICT tools is to supplement administrative work and support traditional teaching strategies. This level is followed by an intermediate-level integration, where ICT tools provide enhanced teaching opportunities. Finally, a high-level integration is where the sophisticated use of CK, PK, and TK provides an optimal learning opportunity that is only possible when the teaching strategies are mediated by ICT tools.

Table 5.1

Integration Levels

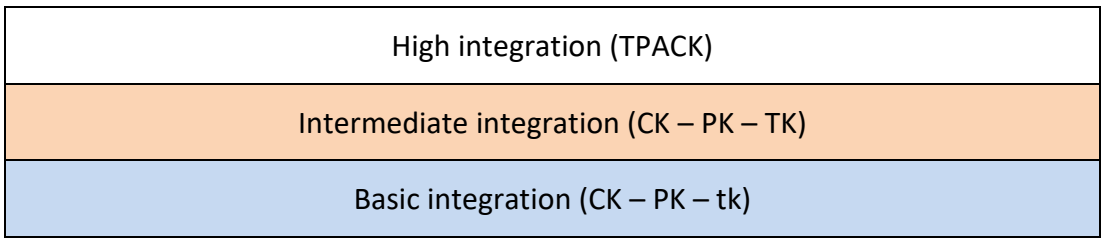
Basic integration	Intermediate integration	High integration
In the basic integration level of ICT, teachers' technology use is minimal, as the tools integrated make no change in the teaching strategies. Instead, this level of integration only implies a basic digitisation of the delivery of critical reading strategies.	In the intermediate level the ICT tools integrated bring enhancement to the critical reading strategies they are applied to, with technology being used to design interactive and dynamic tasks that go beyond the limitations of a traditional classroom and teaching strategies.	The high integration level indicates the teacher's ability to employ diverse teaching approaches tailored to the curriculum and students' needs, effectively creating active-learning activities to help build and improve students' critical reading proficiency through the integration of different ICT tools. As such, the integration of TPACK knowledge is equilibrated, up to the point where, without the use of ICT tools to teach, the strategies would not effectively achieve their objectives.

Note. ICT = information and communication technologies; TPACK = technological pedagogical content knowledge.

The TK use and skills are positively cumulative, which means the skills in the basic level are present in the intermediate and high integration levels, but not all the skills found in the intermediate and high levels are found in the basic level. Figure 5.1 illustrates this phenomenon, with the basic integration level showing the three basic TPACK areas separated, with TK described as *tk* instead, representing the low technology knowledge needed to integrate ICT at this level. On top of the basic level sits the intermediate integration level, where TK has been capitalised as teachers demonstrate well-developed technology knowledge. Finally, the top of the structure is high-level integration, where the knowledge areas have merged into the holistic TPACK. Nevertheless, this does not mean that only higher level integration is needed or mandatory to teach. Instead, it delineates the cumulative nature of technology knowledge, and how the basic technology skills lead to the intermediate skills, which ultimately lead to the high-level ICT integration.

Figure 5.1

Cumulative Nature of Technology Knowledge



Note. CK = content knowledge; PK = pedagogical knowledge; TK/tk = technological knowledge; TPACK = technological pedagogical content knowledge.

Findings here resonate with those of different authors that also describe the developmental nature of ICT integration skills and TK, such as the SAMR model (Puentedura, 2010), a framework used to classify and evaluate the integration of technology in education. Recapping Section 2.5, SAMR stands for substitution, augmentation, modification, and redefinition, representing four levels of technology integration. At the substitution level, technology is used as a direct substitute for traditional tools without significant functional changes, for example, using a word processor instead of pen and paper for writing. Augmentation involves using technology to enhance or improve tasks, offering additional functionalities, for instance, using digital annotations and highlighting in an e-book. Modification takes technology integration a step further by fundamentally transforming the task. This includes activities like collaborative editing of documents in real time or creating multimedia presentations. Finally, redefinition occurs when technology allows for entirely new teaching strategies that were previously inconceivable. It involves creating innovative learning experiences, such as global collaborative projects or virtual simulations. Although, like many other models, there is mixed reaction to SAMR, it does provide a new way of thinking about ICT integration, and the use of SAMR and TPACK together have contributed to a better understanding of the integration of ICT and its benefits. These models help consider not only the technical aspects of technology use but also the pedagogical approaches and content-specific considerations. It helps ensure that technology is used in ways that enhance teaching and learning, promote deep understanding, and prepare students for today's digital demands (Chigona & Tunjera, 2020).

5.1.1 Pedagogical Knowledge, Content Knowledge

In this study, *critical reading* refers to the ability to read beyond the surface to uncover implicit meanings. Recapping Section 2.2.2, critical reading involves the active and analytical process of comprehending a text, going beyond its evident meaning to uncover implicit messages and forming well-grounded judgements (Cassany, 2003; de Barón, 2016). The reader constructs meaning based on their knowledge of the author whose work is being studied and the sociocultural context of the time, including attitudes, values, and position in society. Through classroom teaching practices, interventions focusing on reading comprehension can be implemented, incorporating the three components of comprehension: syntactic, semantic, and pragmatic. By integrating these components, students can strengthen their foundational knowledge and develop the necessary skills for critical reading. Such interventions provide opportunities for students to interact, engage, and enhance their understanding through various activities, while under the tutelage of the teacher.

The different teaching methods and strategies used by the teachers to teach critical reading (PCK) demonstrate their understanding and application of instructional strategies, approaches, and techniques to foster critical thinking and analytical skills in students' abilities to read and interpret texts. PCK involves teachers' knowledge of effective methods to guide students in critically analysing texts, questioning assumptions, examining multiple perspectives, and challenging different narratives. PK for critical reading encompasses the selection of appropriate texts depending on the students' knowledge, the design of engaging activities and discussions, and the creation of a supportive learning environment that encourages students' active learning to develop their own interpretations and viewpoints. Teachers with high PK for critical reading are trained to facilitate meaningful and transformative learning experiences that empower students to become active, informed, and socially conscious readers and participants in society.

Finding such abilities in the interviewed teachers could be attributed to how the teachers in this study were employed in privileged private schools affiliated with the IB system of schooling. Consequently, all the teachers included in this study possessed undergraduate teaching qualifications from reputable universities, and many have pursued additional postgraduate courses and meaningful teaching experienced, thereby providing evidence of their teaching competencies in Spanish language literacy.

Furthermore, this study's findings highlight how teachers affirmed having well-structured TK, which supposedly enabled them to integrate ICT tools into their daily teaching practices to the same level of expertise they show with PCK. While these teachers may have general technology knowledge related to everyday tasks like digital communications or online banking transactions, the effective use of technology tools within sophisticated teaching and learning strategies requires specific knowledge or a combination of knowledge such as TPK. However, a contradiction arises when examining the artefacts provided by teachers in support of their claims about TK and its integration for teaching, as despite declaring having relevant TK, some of the artefacts fail to demonstrate the level of proficiency the teachers claim to possess.

5.1.2 Context, Teachers' Attitudes, and Professional Development for ICT Integration

When discussing the institutional context, the research by Brun and Hinostroza (2014) and Tondeur et al. (2008) reported how a supportive environment, where infrastructure, policies, and training and support were available, facilitated teachers' willingness to integrate ICT into their professional practices. Furthermore, when teachers are provided with a supportive infrastructure and organisational policies that facilitate the integration of technology, they tend to perceive tasks as simpler and more direct (Lavidas et al., 2022). Once again, such level of intention to use technology suggests that teachers recognise the advantages of these tools in enhancing their productivity both in the classroom and in their personal lives, providing a brewing ground where higher level integration of ICT in teaching can occur.

It is natural to find that the teachers in Bogotá who work at privileged schools understand the importance of ICT tools and believe they can use them effectively, as they have had the opportunities to learn their use and work in the supportive context needed for ICT integration to succeed in improving student learning outcomes. However, as explained at the start of this chapter, despite this understanding, the integration of ICT tools remains only at a basic level in some cases. While the institutional context of their work does not hinder developing meaningful ICT integration, age may be a differentiating factor. Nonetheless, as there is no clear data or analysis to confirm age being a factor in this study, shifting the focus from age prompts a discussion on the attitude towards ICT integration of teachers who possess

strong PK and CK, and how teachers' attitudes may be transformed into adopting and advocating for digital integration for improved teaching and learning.

The literature indicates that when infrastructure is not an issue (Brun & Hinostroza, 2014; Tondeur et al., 2008), the continued professional training and development of in-service teachers is the main issue for the development of TK for teaching. Either initial training or professional development training provides opportunities for teachers to enhance their understanding and skills in using technology effectively in the classroom. As technology continues to evolve and play a significant role in education, teachers need to stay updated with the latest tools, strategies, and pedagogical approaches (Twining et al., 2013). Professional development courses offer valuable insights, practical guidance, and hands-on experience to help teachers integrate technology seamlessly into their teaching practice (Tondeur et al., 2017). The research of Tondeur et al. (2018) involved 931 final-year preservice teachers from Belgium, whose attitudes towards ICT in education and their perception of its ease of use for educational practice improved after a series of strategies focused on improving the competencies teachers needed to design an ICT-rich learning environment. These strategies included presenting how academics modelled teaching methodologies; reflection about the role of technology in education; learning about technology integration by designing curriculum materials; activities of collaboration with peers that might mitigate feelings of insecurity; scaffolding authentic technology experiences; and ongoing and process-oriented feedback about the teachers' abilities to use ICT in the classroom. The above noted research highlights the need for engaging experiences among preservice teachers to enhance their comprehension of the connection between theories and teaching practice. It also emphasizes the essential role of preservice training in improving TPACK.

On the other hand, this study's findings suggest teacher's professional development is not limited to their initial teacher training but also includes the ongoing development of their skills while working, as found in a study by Rich et al. (2017), who reported on the impact of a year-long professional development program on teachers' self-efficacy and beliefs regarding computing and engineering. The results indicated that the year-long training had a positive effect on teachers' beliefs about the importance of using ICT to improve teaching and their confidence in using such knowledge in their professional practice. On the subject of literacy, research by

Beschorner and Woodward (2019) highlights how professional development via an online summer course can lead to improved integration of ICT tools like Chromebooks for creating multimodal texts and collaborative activities including reading and writing. On top of this, the teachers who were part of the summer course also found new and improved ways to use the digital tools they already knew, plus they acquired the skills to employ ICT as a catalyst for exploring new technologies in their literacy instruction and actively worked to overcome obstacles like the lack of context found in some training.

Nevertheless, behind the underlying differences to understanding teacher's willingness and ability to integrate ICT, may lie the challenges of methodological self-reporting issues, as the most common method to address the issues run on teacher's self-reporting. The literature suggests that subjective self-assessment, defined as estimating one's skill or competence in a particular area, is often biased and inaccurate. Individuals tend to overestimate their abilities, especially those with lower expertise or training (Maderick et al., 2016). Factors such as knowledge, difficulty of the material, and desirability of the skill can affect the accuracy of self-assessment. Some studies focus on the validity of subjective self-assessment, particularly in the context of digital competence (Viberg et al., 2020). Their findings indicate that subjective self-assessment does not align well with objective assessments and tends to demonstrate leniency bias. Several studies comparing subjective self-assessment with objective tests have shown significant differences, with self-assessment scores being higher and less accurate (Maderick et al., 2016).

In conclusion, there is evidence of ICT integration happening across three levels, ranging from basic to high integration, each contingent on the depth of ICT integration and its impact on teaching strategies. Moreover, the cumulative nature of technology knowledge within the TPACK framework underscores the significance of ongoing professional development for teachers, both in initial training and continued learning, to ensure they remain adept at leveraging ICT tools to enhance student learning outcomes. However, it is relevant to acknowledge methodological issues such as subjective self-assessment biases and the need for comprehensive evaluation tools that consider pedagogical considerations and emerging ethical concerns. Therefore, while recognizing the transformative potential of ICT integration, it is imperative to address

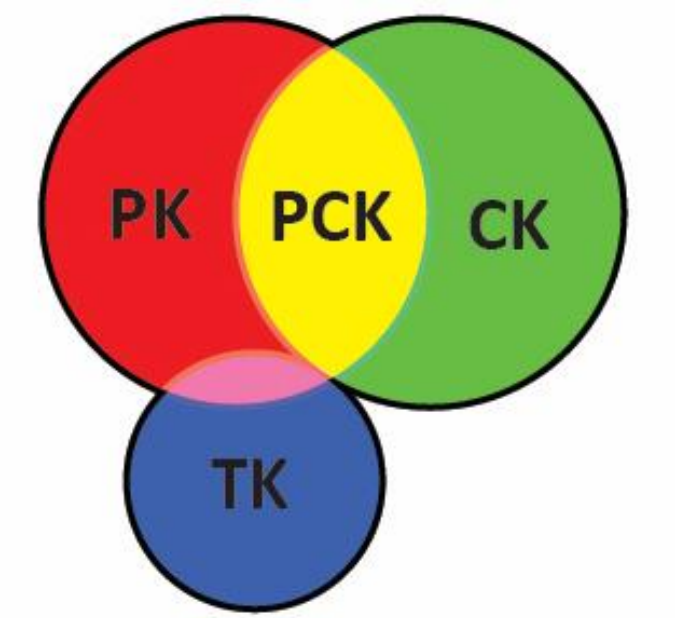
these challenges and foster a supportive environment that facilitates teachers' ongoing development and effective utilization of technology in education.

5.2 Basic ICT Integration Level

As noted above, the basic ICT integration level refers to the initial stage of technology integration in teaching/learning strategies, with teachers incorporating ICT solely as a direct replacement for traditional tools or teaching, without any pedagogical improvement of the educational objectives. Examples of basic-level TK integration for teaching in this study were found in the use of ICT as a substitute for display of traditional teaching content. This substitution can happen for group teaching either by substituting the use of the traditional blackboard with presentation software like PowerPoint, Canva, or Prezi (for more examples refer to the artefacts shared and analysed in Section 4.2) or by substituting the use of paper-based lessons with the sharing of digital documents, usually through a PDF or Word file as an email attachment or in a web-based collaborative platform for document management and storage. Figure 5.2 illustrates how this TK integration does not directly enhance or improve the learning of the students, as the teacher’s TK is marginal to the PK and CK areas. The integration of the three TPACK knowledge areas at this level may align with the substitution stage of the SAMR model, as technology is being used as a direct substitute for traditional tools without significant changes to the lessons or strategies to teach critical reading.

Figure 5.2

Basic ICT Integration Level



Note. PK = pedagogical knowledge; PCK = pedagogical content knowledge; CK = content knowledge; TK = technological knowledge.

5.2.1 Base Knowledge Areas: PK, CK … TK?

As discussed previously, a finding of this study showed teachers having a proficient knowledge of critical reading (CK) and of different teaching methods (PK) to provide students with relevant active-learning activities towards improving and achieving critical reading (PCK). The finding noted that teachers' high-level PCK gave them confidence to choose and use a series of different critical reading teaching strategies, as can be seen in Table 5.2. Nevertheless, the findings also showed that despite teachers claiming confidence in their TK based on their daily use of technology, the results failed to substantiate this claim, as shown in the TCK and TPK columns of Table 5.2, where the only available data are the content display and delivery ICT tools discussed before.

Table 5.2

Basic ICT Integration Level

PK	CK	TK
Activating prior learning	Semantic reading	Productivity software
Collaborative learning	Pragmatic reading	Email
Project-based learning	Characterisation	Communication software (Zoom)
Scaffolding	Critical thinking	Video beam
Researching	Narrative structures	
Presentation	Theatre plays	
PCK	**TCK**	**TPK**
Summarising		Content display and delivery
Keyword identification		
Fact checking		

Note. PK = pedagogical knowledge; CK = content knowledge; TK = technological knowledge; PCK = pedagogical content knowledge; TCK = technological content knowledge; TPK = technological pedagogical knowledge.

Nevertheless, even when it is considered a basic integration of ICT in the classroom, a number of benefits of this integration of ICT via the substitution of the traditional teaching content with digital applications in teaching environments can be found (Garcia, 2023; Hartman et al., 2019). For example, it allows teachers to save time by creating one digital presentation that can be shared among different groups, therefore keeping the teacher from having to rewrite the same information to be shared between different groups. Furthermore, the same presentation can be shared online with the students, making its creation more useful. A second example of low ICT integration used in schools is the use of newer software like Socrative to save considerable time when calculating students' grades, especially when compared to manual methods, as educational software and platforms provide scoring tools that collect answers and provide results immediately. Considering the multitude of responsibilities and additional tasks that teachers face today, integrating ICT into their administrative work optimises teachers' time usage and reduces workload, a scenario where it is undeniably more advantageous to use such available tools (Haydn, 2014).

This first stage in the integration of ICT is important for the professional development of teachers as well. Simple ICT integration experiences help teachers to build confidence in their TK skills, paving the road towards a better comprehension of

TK and further integration of ICT tools to support teaching strategies (Garcia, 2023). Garcia (2023) argues that while general technology knowledge related to everyday tasks using ICT tools to create teaching and learning strategies requires some basic skills, this undeveloped use represents a starting point towards achieving and recognising the benefits and potentially seeking a higher level of integration. Even if not pedagogically sophisticated, this basic ICT integration effort and the eased administrative work influence the perceived usefulness and ease of use of ICT tools, which eventually plays a significant role in determining teachers' intention to further integrate technology into their work. In other words, the basic use of productivity software plays a crucial role in freeing up teachers' time (Sabanci et al., 2014; Selwood & Pilkington, 2005), and this free time presumably allows them to focus more on instructional aspects of their job, which in turn is perceived as a benefit that, when correctly used, will lead teachers to keep using and integrating ICT tools. Thus, this basic integration of ICT into day-to-day teaching can bring further benefits to learning for the students on top of facilitating the reduction of workload of the teachers through supporting administrative applications.

5.2.2 Teachers' Perceptions of TK and the Literature

Following the previous argument where it was established how the teachers in this study perceived having a good understanding of TK, it is relevant to discuss how this perception contradicts the literature, where in-service teachers usually report not being as confident about their use of TK as much as they are about their CK and PK. The more experienced teachers are seen as hesitant to embrace technology in their teaching practices. Such contradiction is confirmed when compared with findings discussed in the literature review chapter such as Castéra et al. (2020), who wrote about teacher educators from six European and Asian countries self-reporting about their TPACK levels. In the findings from that study, teachers' TK and its integrated knowledges TPK and TCK reported lower scores than their CK and PK (Lin et al., 2013; Muñoz & Ruiz-Domínguez, 2022). When comparing the results of Castéra et al. (2020) with the findings of the current study, two topics will be discussed further, as it is important to understand the reasons why teachers may or may not be willing to continue integrating ICT beyond the basic level. These are age and proficiency in subject context.

Pertaining to years of experience as a factor in how teachers integrate ICT into teaching, Castéra et al. (2020) considered how age may be an important issue when discussing the confidence demonstrated by teachers. According to the research by Castéra et al. (2020), younger teachers are more accustomed to the use of different ICT tools as part of their day-to-day living; additionally, more recently established college curriculums have developed training in digital technologies to teach as part of their preservice diplomas. These two influences could help the younger teachers' TK development and their confidence to create ICT-mediated lessons and strategies to teach critical reading, a view also shared by Hartman et al. (2019) and Li et al. (2015) in their research. This in turn describes a different context for more experienced teachers, whose general familiarity with ICT applications for daily use is allegedly lower, with limited exposure to technology in their everyday and personal lives. Furthermore, most preservice curriculums did not start providing regulated ICT courses until as recently as 2011 in Australia (Reyes et al., 2017) or 2013 in the Colombian context (Arévalo Duarte et al., 2016). This means teachers in Bogotá did not start receiving any policy-regulated ICT training earlier than 2013, which may explain why, despite their extensive experience, some teachers lacked confidence in using, creating, or adapting teaching strategies that involved ICT and the general TK, TCK, and TPK levels.

Unfortunately, in an effort to avoid bias, this research did not consider age as a variable impacting on teachers' use of ICT in everyday classrooms. Rather, it focused on the experiences of the participants, and therefore, the ages of the participants are unknown. Nevertheless, noteworthy conclusions can be drawn from the data at hand: it is interesting how the two most experienced teachers (the ones who had been teaching the longest out of the nine participants) submitted artefacts that presented a less sophisticated integration of ICT tools. Besides the research by Castéra et al. (2020), the literature has further findings regarding an apparent correlation between age and TK. For example, Muñoz and Ruiz-Domínguez (2022) described how participants in their study presented an inverse relationship between age and the level of personal use of ICT and an interest in learning about use of ICT tools to teach, with older teachers acknowledging not being in accord with the literature on how integration of ICT tools improves general learning and teaching practices. In fact, it is challenging to differentiate age and teaching experience as they are closely interdependent factors. The vast majority of seasoned teachers are also the most senior in age, reporting both the highest PK, CK,

and PCK confidence (Lin et al., 2013) but also being the least inclined to use ICT in their personal lives (Muñoz & Ruiz-Domínguez, 2022), leading to the previously described inverse relation between the age factor and ICT integration in teaching. The above-described lack of ICT integration in initial teacher training may contribute to teachers having basic ICT integration skills.

Another reason why basic-level ICT integration could be limited to some teachers in this study is because of the purposive selection of participants. Continuing the comparison of teachers' TK-related perceptions to fully appreciate the finding related to the Bogotá teachers, it is relevant to discuss the context of the teachers in this study with contexts where teachers had contradictory perceptions. The findings of this study were strongly influenced by the selection of schools (and therefore, teachers) for this study, which may play a significant role in explaining the differences between findings. In the Castéra et al. (2020) study, the context of the sample is not discussed deeply, just focused on explaining how the sample consisted of university teachers involved in different initiatives using educational technology in courses for preservice teachers. In comparison, the sample for this research consisted of participants from IB schools in Bogotá (see Section 3.3). IB schools have a highly selective hiring process that allows them to employ the best teachers available in the city and to provide its employees with a supportive environment, with policies focused on promoting a vision of high-quality education that creates student-centred teaching spaces where technology is integrated in a meaningful way, as well as ongoing training and evaluation processes at various levels. So, the institutional context in which the Bogotá teachers are investigated in this study offers them a set of benefits that cannot be traced back to Castéra et al. (2020).

The discussion above emphasised the significance of the successful implementation of formal and informal professional development programs in enhancing teachers' self-efficacy and teacher confidence. The discussion then turned to how, by receiving ICT training, teachers can improve their TK towards achieving improved ICT integration that not only provides administrative efficiencies but also brings learning-related benefits (Yildiz Durak, 2021). Institutions must make efforts to keep teachers updated and interested, not only regarding PK and CK, but especially in the always changing realm of TK. By doing so, institutions can improve the capacities of Spanish literacy teachers to use the infrastructure at hand, and hopefully,

to create active-learning scenarios where students can thrive and become critical readers using ICT tools in a more complex fashion, as the discussion on the intermediate and high levels will show.

This section has discussed the basic level of ICT integration used by some teachers in private schools in Bogotá. It was explained how this level of integration is evident in teachers' practices when teachers attempt to integrate ICT tools in their regular classroom activities without the needed expertise, thus failing to provide any pedagogical enhancement. Teachers who use this type of integration are not actively and/or consciously thinking of integrating ICT for its pedagogical uses. However, it was also acknowledged that this basic integration can play a crucial role in initiating and building teachers' confidence and improving their perception of ICT as a teaching and learning tool. Teachers' self-perceptions about their ICT competency are significant, as some believe their use of ICT is effective in enhancing pedagogic strategies, although literature suggests that teachers often misjudge their TK. Age and context were considered as potential factors influencing teachers' perceptions and use of ICT tools, but the data available fails to provide enough evidence to safely establish a trend. Instead, the discussion turned to the importance of the context where ICT is a major concern, and its relevance to improve teacher's TK. Research highlights that professional development is the key factor in improving ICT integration for teaching any subject matter, and how professional development that supports the growth of TPACK not only enhances teachers' knowledge, skills, and willingness to integrate ICT into their teaching (Brun & Hinostroza, 2014) but also positively impacts student learning outcomes (Ertmer et al., 2012), setting the stage for higher level integration of ICT in teaching. Recognising that a teacher's proficiency in TK is crucial for an optimal integration with their PK and CK, forming a holistic TPACK, the process of selecting and using the most suitable ICT tools for specific activities involves critical thinking and a deeper understanding of technology in an educational context, distinct from general TK.

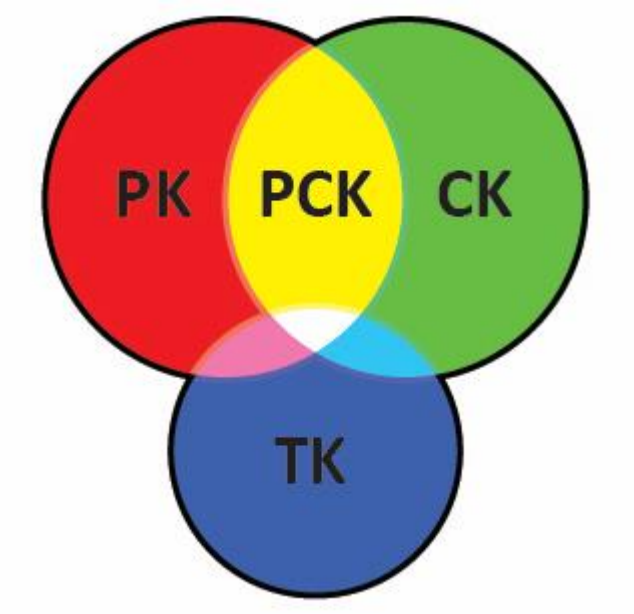
5.3 Intermediate ICT Integration Level

The intermediate level of ICT integration denotes the use of strategies where the teacher's knowledge of ICT enables the creation of pedagogical strategies that enhance learning by modifying teaching and learning practices through integration of ICT tools.

At this level of integration, there is a transition from teacher-centred use of ICT to a student-centred approach (Koehler et al., 2013). The teacher-centred integration of ICT was described as the basic level of integration, where teachers' main use of ICT was for their benefit, not their students'. Instead, in the intermediate level of ICT integration, the teacher takes on the responsibility of researching, understanding, selecting, and organising ICT tools for a planned pedagogical strategy for a specific critical reading learning objective. This is the main difference between the basic and intermediate levels: the teachers' willingness to integrate ICT to teach, as opposed to merely using ICT for time-saving, non-teaching benefits. Because of these differences, the TK of the teachers becomes relevant in the classroom for teaching, which is illustrated in the way TK slightly overlaps the PK and CK areas of the TPACK in Figure 5.3.

Figure 5.3

Intermediate ICT Integration Level



Note. PK = pedagogical knowledge; PCK = pedagogical content knowledge; CK = content knowledge; TK = technological knowledge.

These new areas of integration highlight the significance of teachers' TCK (illustrated as the area in cyan colour), as teachers' necessitate a comprehensive understanding of different available ICT tools in their own context, their distinctions, potential issues, and benefits in being use to deliver the intended strategy and promoting the active learning of the students (see Table 5.3). Additionally, this intermediate integration also emphasises the TK of the teacher that leads to the TPK area illustrated

as the area in pink colour, as can be appreciated in Table 5.3: This TPK commences a discussion about how the available ICT tools can be used towards achieving the expected learning goals (Koehler et al., 2013). A teacher's integration of ICT at intermediate level provides several benefits: First, it allows them to use technology towards successfully addressing certain classroom management issues that could hinder learning and engagement. Thus, with more time to dedicate to actual teaching, through the improved integration of ICT tools, teachers achieve upgraded instructional outcomes and improved instruction. Second, teachers can design strategies that promote collaboration among students through shared documents or group work, facilitating digital collaboration and knowledge sharing. This encourages self-directed learning and inquiry-based learning using a virtual space. Third, individual students can also explore a wide range of information that has been carefully selected by the teacher. This shift in approach allows for greater student engagement and active participation in the learning process, helping them to engage in reading from a critical perspective, thus achieving critical reading (Koh et al., 2017; Reyes et al., 2017).

Table 5.3

Intermediate ICT Integration Level

PK	CK	TK
Activating prior learning	Semantic reading	Productivity software
Collaborative learning	Pragmatic reading	Email
Project-based learning	Characterisation	Communication software (Zoom)
Scaffolding	Critical thinking	Instant messaging software
Researching	Narrative structures	Video beam
Presentation	Theatre plays	Educational video games (Kahoot!, Nearpod)
		Educational software (Padlet)
PCK	**TCK**	**TPK**
Summarising	Kahoot!	Digital game-based learning
Keyword identification	Nearpod	Content display and delivery
Fact checking	Padlet	

Note. PK = pedagogical knowledge; CK = content knowledge; TK = technological knowledge; PCK = pedagogical content knowledge; TCK = technological content knowledge; TPK = technological pedagogical knowledge.

It is important to note that as teachers progress to the intermediate level, the ease of use, confidence and skills acquired at the basic level become integrated and build upon their overall ICT integration abilities, which are cumulative in nature. This integration process, when compared against the SAMR model, refers to the modification stage, in which technology is used to design interactive and dynamic tasks that go beyond the limitations of a traditional classroom (Hilton, 2016).

5.3.1 Example of Intermediate ICT Integration: Padlet

There are a number of ways in which ICT has been used to improve teaching and learning. An example of the ICT tools used by Spanish literacy teachers to teach critical reading in secondary schools in Bogotá at intermediate level is the Padlet. Recapping the information described in Chapter 4, Padlet is a collaborative virtual bulletin board that allows users to add multimedia content and interact in a shared online space (Waltemeyer et al., 2021). This aligns with the intermediate level of ICT integration as it facilitates the integration through technology of various pedagogical strategies, of teaching resources, and of methods to support desired learning outcomes in a digital learning environment. When used properly, these benefits foster active-learning experiences, as instead of passively responding to traditional teacher instruction, students are encouraged to think critically and respond actively to the content shared on Padlet. Students can explore, analyse, and evaluate different multimedia resources, such as texts, images, videos, and documents, enhancing their critical thinking skills.

The findings of this study concur with those of Jong and Tan (2021), which demonstrated how teachers used the Padlet platform as a digital learning space to enhance learners' engagement, collaboration, and visual communication skills using different pedagogical strategies to develop critical reading. The findings show how during critical reading lessons the teacher may select and provide links on Padlet to activate the students' prior knowledge, by evidencing connections, providing new insights and guiding learning about by previewing headings and leading the students in a critical thinking process towards creating reasonable predictions inside each text's significant context. Padlet allows the teacher to start with a presentation of the theme to be learned, and the students are then tasked with researching and providing argumentative content reflecting their views on the topic being studied, making inferences and predictions, underlining difficult words, establishing keywords, and

creating content summaries, all of which can later be shared with other students or with the teacher. Additionally, the students can create graphic organisers and upload different media they find during their research, which helps them further activate prior knowledge; creating categories and highlighting keywords or saving hyperlinks are activities where teachers can scaffold and help learning. These activities help the students develop their critical thinking towards critical reading and can motivate students to engage in reading for leisure (Goldman et al., 2016; Prado et al., 2022).

Further evidence supporting the benefits of using the Padlet platform as a digital learning space that permits the teacher to enhance learner engagement, collaboration, and visual communication skills using different pedagogical strategies was noted by Waltemeyer et al. (2021). In their study, teachers described how they start reading lessons by explaining to students the subject and the objective of the lesson to activate the students' prior knowledge using Padlet as a platform to curate diverse content related to the study subject connecting a fundamental collection of required reading materials along with an additional set of supplementary documents. Subsequently, students were assigned individual research tasks to generate argumentative content, express their perspectives on the topic, make inferences and predictions, identify keywords and challenging words, and develop content summaries that were ultimately uploaded onto Padlet. This process allowed students to actively engage in the learning process by activating prior knowledge, organising content into categories, and sharing and discussing hyperlinks and key ideas with the teacher or with other communities, including their peers, thus becoming an active participant in the learning process.

As shown in the current study plus others discussed above, using Padlet enables and empowers collaborative learning, as students can write and research freely, experiment, and create their own answers while simultaneously sharing and learning from reading other students' live production both online and in the classroom. These synchronous group activities help students achieve their learning goals and also permit feedback among peers as well as from the teacher (see Artefact 8, Figure 4.15). Collaborative learning with ICT provides several benefits that contribute to a more effective and engaging learning environment, empowering students to actively participate, collaborate, and develop essential skills needed for success in the digital age (Jeong & Hmelo-Silver, 2016).

In an effective pedagogical practice integrated with the use of Padlet, the teacher acts as an aid, scaffolding and helping each student when they face difficulties learning. Scaffolding provides support and guidance to learners, helping them build knowledge and skills, gradually reducing assistance as they become more independent (Martínez-Díaz et al., 2011b). Similar findings about scaffolding in literacy learning are discussed by McMullan and Sutherland (2020) in their research discussed in Chapter 2. In their study, an educational activity was developed to support struggling adolescent readers. The teacher implemented three cycles of instruction, gradually shifting from teacher-led activities to student-led initiatives. In the first cycle, the focus was on teaching students how to become active readers, with the teacher providing scaffolding. The second cycle incorporated student feedback and allowed for more flexibility, with small-group and whole-class reading sessions where students practised comprehension strategies. Students found this collaborative approach to be the most beneficial. In the third cycle, students expressed their preference for reading in groups, and the teacher facilitated the process, enabling students to collectively develop comprehension skills, with more proficient readers assisting their peers. Thanks to Padlet's communication capabilities, these types of teaching cycles are more easily achievable and personalised. Teachers can track the progress of each student through the board and present personalised scaffolding to each one, thus improving how students perform after each cycle.

Furthermore, the findings identified how Padlet offers flexibility and autonomy in learning, as students can personalise their Padlet boards, choose how to present their ideas, and work at their own pace. This autonomy and sense of ownership over their learning can also enhance motivation, as students feel empowered and responsible, which was also evident in a study by Prado et al. (2022). Related to the above, Padlet provides opportunities for creativity and self-expression. Students can showcase their knowledge and ideas in unique ways using various media formats. This creative aspect of Padlet can tap into students' interests and passions, making the learning experience more enjoyable and motivating. Overall, Padlet's interactive nature, collaborative features, flexibility, and creative possibilities contribute to an enhanced learning environment that can boost student motivation.

Similar benefits to the previously described findings when using Padlet to teach were reported by Taufikurohman (2018), whose respondents provided positive

feedback after using the platform as part of a strategy to learn how to write descriptive texts. In that study, 27 students in the experimental group reported finding it easy and interesting to use Padlet, as the platform enhances motivation during writing assessments. Padlet can improve motivation in several ways. First, it provides a visually appealing and interactive platform for students to engage with learning materials. The multimedia features of Padlet, such as the ability to add images, videos, and links, can make the learning experience more engaging and stimulating for students, leading to increased motivation. Second, Padlet promotes collaboration and interaction among students. It allows for group discussions, brainstorming, and peer feedback, which fosters a sense of community and active participation. As described before, these collaborative learning approaches, where peers can help each other, have been found to have significant effects on improving students' academic success, developing positive attitudes towards courses, providing motivation, fostering cooperative working habits, and enhancing competition skills (Altun, 2015). By allowing students to edit each other's contributions and engage in debates, Padlet collaborative walls promote peer interaction, sharing, and distribution of knowledge among learners. The interactive features of Padlet support deeper thinking, increased participation, and the creation of thoughtful content.

5.3.2 Teaching and Learning Through Playing Video Games

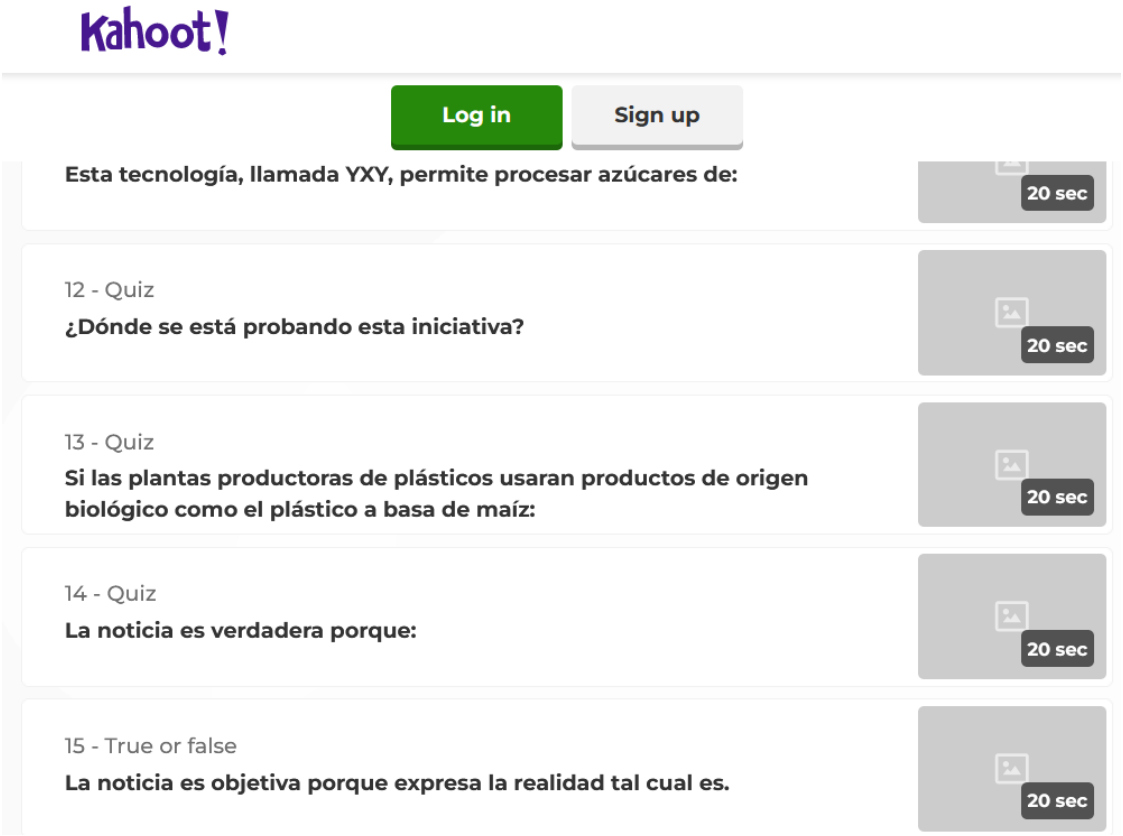
Digital game-based learning or DGBL is an educational approach that integrates the use of digital games into the learning process, as discussed in Chapter 2 (Section 2.3.3). DGBL leverages the engaging and interactive nature of games to enhance student engagement, motivation, and learning outcomes, shifting the focus from the teacher and making the students active learners (Vogel et al., 2006). The findings of the current study witnessed the integration of digital games into strategies for teaching Spanish critical literacy. Similar to the findings of Vogel et al. (2006), in this approach, Spanish language content focusing on critical reading experiences are embedded within the game design, creating an immersive and interactive learning experience. Students actively participate in gameplay, solving problems, making decisions, and applying knowledge and skills in a virtual environment. The virtual environment can help the students to visualise the historical context of the text being studied. DGBL offers students opportunities for personalised learning, immediate feedback, problem-

solving, collaboration, and development of decision-making skills by solving tasks and competing to be better than their peers, providing an engaging and enjoyable experience for students (Wang & Tahir, 2020). The Bogotá teacher-participants in this study displayed a positive attitude towards DGBL and described how they integrate it in two main ways that have proven beneficial during their critical reading strategies: first, to improve student engagement by initiating or concluding lessons in an enjoyable way and, second, to support student learning.

One DGBL tool featured in this study was Kahoot!, which is commonly integrated by Bogotá's teachers to support student engagement during critical reading lessons. Kahoot! is an interactive learning platform that uses gamification to create engaging experiences for students, enabling teachers to create multiple-response quizzes and surveys that students can answer using their own devices. Teachers who integrate Kahoot! described how – thanks to the platform's live and synchronous format, multiple-choice questions, and customisable content – it promotes active participation and motivation and provides immediate feedback. Teachers also discussed how when they use Kahoot!, it encourages discussions about the subject played, while also offering data analytics for formative assessment, as can be seen in Figure 5.4, a Kahoot! with prompts about a news article. The teacher uses questions like number 14, "The news is true because", to discuss the context where the news is written, or number 16, "The news is only of interest to those who make plastic?", to further attract the students' interest about *why* the news is important, relevant, and interesting for their lives.

Figure 5.4

Kahoot! With Prompts About a News Article



Note. Translation:
This technology, named YXY, allows the processing of sugars like:
12 – Quiz
Where is this initiative being tested?
13 – Quiz
If plastic producing plants used products from biologic origin for corn-based plastic:
14 – Quzi
The news is real because:
15 – Truth or false
The news is objective because it expresses reality as it is.

An example of how Kahoot! is used in class for engaging students with critical reading content is the questionnaire about the existentialist works of Kafka and Sartre (see Artefact 2, Figure 4.5). In this activity, the teacher designed a quiz addressing the basic themes needed to develop the critical thinking and reading of the stories at the start of the class. Creating this exercise in the platform served the teachers threefold: First, the teachers could quickly and easily determine if the students had read the novels, something that in traditional paper quizzes would take longer. Second, the teacher created prompts to recognise the level of understanding achieved of these basic themes and, depending on that level, to reinforce any of the topics in need of scaffolding. Third,

the questions also addressed the key points where the students' prior knowledge was important to the success of the lesson, focusing on specific relevant content. Additionally, the teacher also established that the use of this Kahoot! gives an entertaining start to the class, increasing student engagement throughout the lesson. In consequence, the use of Kahoot! provided a quicker and easier assessment than a paper-based quiz, but compared to a basic integration and through the improved understanding of the ICT tool, the teacher was able to create an engaging activity, where prior learning was activated, reinforced, and scaffolded towards the development of new learning.

In light of the above-discussed positive properties, Kahoot! has gained recognition and is one of the most common TK tools used. The research of Licorish et al. (2018) supports these claims; it involved an exploratory case study with 14 students, and after several rounds of teacher-led Kahoot!s and student-created Kahoot!s, delivered several results. Among the findings, Kahoot! positively impacted student engagement since students felt that Kahoot! captured their attention and interest, and it provided timely breaks for reflection and discussion during longer lectures. Kahoot! also motivated interaction and competition in the classroom, leading to increased attentiveness. This competitive nature of DGBL further motivated students to perform well and compare their own progress with their peers' progress. Overall, Licorish et al. (2018) reported how Kahoot! enriched the teaching and learning experience by supporting knowledge acquisition, providing opportunities for revision, and allowing students to focus on specific relevant content.

In comparison with the Bogotá teachers' views about the "simplicity" of Kahoot!, the findings of Licorish et al. (2018) did not include negative comments about Kahoot!'s straightforwardness or conflicts with meeting lesson goals, as stated in the results chapter. The reasoning behind this difference in perception about lesson goals might come from the teaching level in the study by Licorish et al. (2018), which involved university students, who allegedly have a higher level of maturity and may respond differently to using Kahoot!. Instead, Licorish et al. noted that student motivation in Kahoot! can be hindered by factors such as the use of inappropriate names and the perception of guessing games as purely entertaining rather than educational. Furthermore, university students prioritise subject-relevant content and may not see value in off-topic material delivered through Kahoot!. To address these issues, instructors incorporating Kahoot! into their lectures can reduce distractions by

shortening the duration of gaming sessions and allocating more time to post-Kahoot! discussions and problem-solving strategies. Striking a balance between testing new and recently acquired content is crucial to maintaining student engagement and maximising the effectiveness of Kahoot! as a learning tool. Despite these challenges, both Licorish et al. (2018) and Wang and Tahir (2020) encourage teachers to thoughtfully introduce gameplay elements to harness the potential benefits of gamification in learning sessions.

The Bogotá teachers in this study, who also wished to avoid the simplicity of closed questionnaires, described how they found other gaming platforms besides Kahoot! to provide them with improved pedagogical experiences better suited for assessing critical thinking in critical reading lessons. The other game reported in the current study was Nearpod, another platform discussed in the results chapter. Nearpod provided the motivational aspects sought by the teachers when using DGBL, but it also has a set of other built-in capacities that can be used to improve the teaching and learning experience of critical reading. The Nearpod educational platform allows teachers to gamify and deliver engaging lessons, providing a range of features such as interactive presentations by both teachers and students, virtual reality experiences, self-assessment measures including matching, true/false, multiple choice, and fill-in-the-blank questions, and collaborative activities, as well as supporting interaction between teachers and students (Mallinson, 2022). On top of these benefits, students can participate in real-time activities, respond to questions, and collaborate with their peers through their devices. Nearpod promotes student engagement and active learning and provides teachers with valuable insights into student progress and understanding.

From an administrative perspective, teachers can easily upload their existing lesson materials or create new ones using Nearpod's interactive tools, acting as a repository of resources that may be readily accessed. These ICT lessons have enhanced benefits over paper-based lessons: they can be tailored to pause in specific parts, linking to secondary content that teachers can use to show the influence of context in texts. The pauses can also be used for a question that leads the students towards thinking critically by challenging them to reconsider, explain, and rethink the text before answering the question about the subject. Teachers using Nearpod concluded that the opportunity to upload support documentation is very important, as it provides them with the possibility of allowing students to read from or play with any of the learning content selected by

the teacher in their own time, taking pauses and rewinding as needed. Teachers also described how Nearpod allows them to create mandatory pauses where they can guide student learning by asking questions or linking to secondary resources like videos or supporting lectures. Teachers use these pauses to encourage students to reflect and progress towards critical thinking by (a) considering the context of what is written, (b) questioning the assertions made by the writer, (c) activating previous knowledge by comparing with other authors or content or even with the student's past production, and (d) analysing and (e) evaluating the assumptions made by the writer. In these ways, Nearpod supports student learning (Huizenga et al., 2017).

The implementation of the poll resource tool in Nearpod offers a valuable opportunity to engage students through feedback, whether in real time or at their own pace. Poll activities enable teachers to pose multiple-choice questions without a definitive correct answer, serving various purposes such as assessing comprehension, conducting class polls, highlighting student opinions, and more. Polls can be effectively used during presentations to break down the material into sections, allowing students to assess their progress and ask for the teacher's help if needed. Research by Tornwall et al. (2020) also highlights the positive impact of polls on participation and classroom relationships, as they promote discussion and encourage student voices. Nearpod's unique feature ensures that only the lesson creator can view student responses, thus maintaining anonymity and reducing student anxiety. This allows students to focus on learning while giving teachers the option to share results, such as through pie charts, or keep them private. Additionally, Nearpod's interactive educational platform provides the necessary flexibility for innovative teaching methods, allowing instructors to access detailed analytics of student interactions and offering a "student-paced" session for convenient access to the material.

The teachers in this study who used Nearpod did so to create a more enjoyable and interactive learning experience that aligned with their PCK values. The way the teachers integrated Nearpod showcases differences in their TCK and TPK when compared with the basic integration level: TCK is demonstrated by the teachers' understanding of Nearpod's features, advantages, and various applications compared to other software or traditional methods. On the other hand, the TPK is evident in the teachers' selection of educational strategies and techniques when using Nearpod as a teaching tool.

Some of the participants in this study demonstrated being capable of an intermediate level of integration of ICT tools, which effectively enhanced learning outcomes, increased student engagement, and addressed teaching challenges. The use of Padlet, Kahoot!, and Nearpod exemplified the potential of these tools in creating interactive and enjoyable learning experiences that are motivating for students. These experiences are particularly valuable as they can be extended beyond the classroom, allowing for continued communication and interaction between students, teachers, and peers. The use of ICT tools facilitates improved communication and enhances the pedagogical strategies employed, resulting in a higher level of PCK. Participants showed a strong command of critical reading skills and a solid understanding of pedagogical tools for designing learning scenarios. Furthermore, the intermediate level of integration of ICT tools provided the additional benefits discussed earlier.

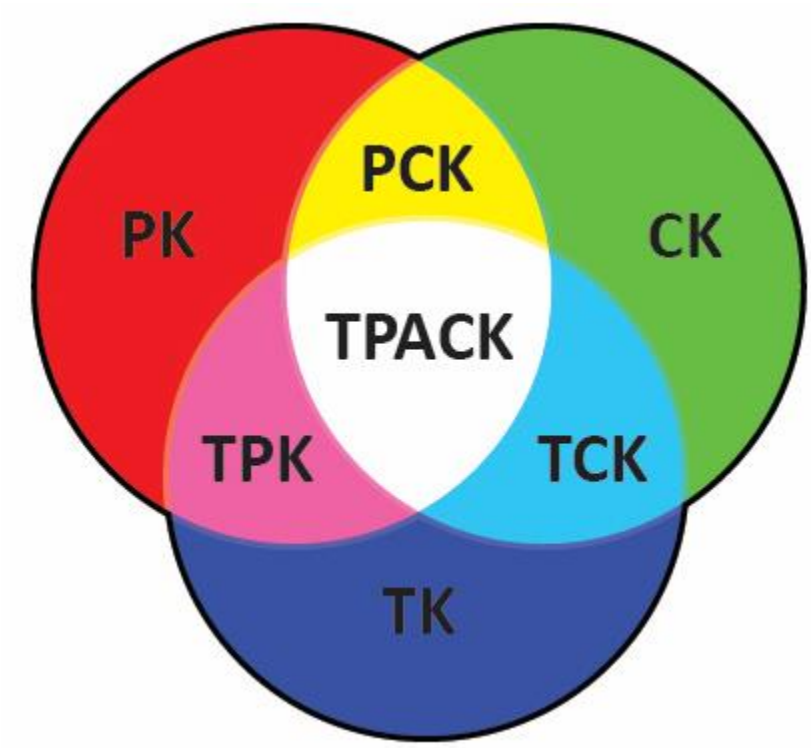
However, the use of technology for this intermediate integration was limited, relying on only one software for each pedagogic strategy, thus improving the learning outcomes but under a limited scope. Comparing, this suggests that there is room for the teachers to improve their TK, TPK, and TCK, towards achieving more of the benefits that ICT at a high-level integration can bring for their teaching strategies. Despite this, it is important to recognise that these types of teaching strategies require teachers to demonstrate a higher TPK than the one found in the basic integration level, which means the participants were able to understand, discriminate between, and choose among several ICT tools to create opportunities for active and collaborative learning of critical reading by students.

5.4 High ICT Integration Level

The third feature in the findings of this study indicates how teachers can integrate a varied range of ICT tools to enhance the learning and delivery of different literacy content and teaching techniques tailored to a given curriculum and to each student's needs. In other words, the teacher's high command of TCK, PCK, and TPK are integrated to such a point that without the use of the selected ICT tools to teach, some of the strategies simply would not achieve their ends. This level of integration is illustrated in Figure 5.5 and is equivalent to the redefinition level in the SAMR model.

Figure 5.5

High ICT Integration Level



Note. CK = content knowledge; PCK = pedagogical content knowledge; PK = pedagogical knowledge; TCK = technological content knowledge; TK = technological knowledge; TPACK = technological pedagogical content knowledge; TPK = technological pedagogical knowledge.

As discussed in the previous sections, it is not surprising to find that all the teachers in this study have well-developed PK and CK after situating the study in private IB schools, which are privileged to select teachers who have had the best teacher development and training (even if a traditional teacher training). Additionally, it was interesting to find that some of these teachers have a well-structured command of TK areas, with deeper insights about how to use different digital tools and when to integrate them for the creation of active-learning strategies and reaching the desired pedagogical outcomes, compared with the teachers integrating at the basic and intermediate levels. The command of these areas and the strategies that spring from them can be seen in Table 5.4. As is evident from the table, the knowledge is built upon the items found in Table 5.2 and Table 5.3, which contained the strategies and tools from basic and intermediate levels, due to the cumulative nature of the integration of ICT for teaching.

Table 5.4

High ICT Integration Level

PK	CK	TK
Activating prior learning	Semantic reading	Productivity software
Collaborative learning	Pragmatic reading	Email
Project-based learning	Characterisation	Communication software (Zoom)
Scaffolding	Critical thinking	Instant messaging software
Researching	Narrative structures	Video beam
Presentation	Theatre plays	Educational video games (Kahoot!, Nearpod)
		Educational software (Padlet)
		Podcasts
		Audio-recording apps
		Audio-editing apps
		Online forums
PCK	**TCK**	**TPK**
Summarising	Kahoot!	Digital game-based learning
Keyword identification	Nearpod	Blended learning
Fact checking	Spotify	Flipped classroom
	Anchor	Online soap opera plays
	YouTube	Content display and delivery

Note. PK = pedagogical knowledge; CK = content knowledge; TK = technological knowledge; PCK = pedagogical content knowledge; TCK = technological content knowledge; TPK = technological pedagogical knowledge.

5.4.1 A High ICT Integration Teaching Strategy for Improving Critical Thinking

One important characteristic that stands out for the high-level integration is recognising the dynamism and complexity of a strategy that suits this level. One of the strategies fulfilling these requirements is the blended project-based strategy named *Soap opera for critical reading* explained in detail in Section 4.8. The findings show how, building from a well-developed PK and CK, the teacher's high TK level enabled the integration of different ICT tools for enhancing student engagement in the class lessons and their learning. The strategy will be discussed on a step-by-step basis to enable deep understanding of each part, how the ICT tools selected for each step are

important, and how ICT can enhance learning outcomes when structured over a well-developed PCK.

Overview of the Strategy – PCK Before Integration of ICT Tools

The first step to appreciate the depth of a high-level strategy is to describe the pedagogy behind it. As established before, the PK and CK of the participant teachers is high. Because of this, they have the potential and experience to use several different teaching strategies and methodologies (listed in Table 5.4). PCK was demonstrated in the construction of the *Soap opera* strategy as an active-learning scenario, where the students participated and shared the creation of a radio soap opera, a co-creation exercise with their peers and family under the teacher's tutelage, using digital tools to collect data, co-create texts, and record them in audio before finally playing them in class. This approach is consistent with the literature discussed in Section 2.1 about how today's education aims at being an active process where the teacher acts as a facilitator, motivating literacy during the classroom instruction (Rosenshine, 2012). This process requires the presentation of well-connected activities that guide students into active learning to use their prior knowledge, establish connections, engage in reflection, and apply new knowledge. In turn, this interactive approach using visual and dynamic teaching and learning materials allows the students to construct knowledge on their own, both on a peer-to-peer and teacher-to-peer basis, contextualising the written word and using it to create their own knowledge (Gee, 2007).

During critical reading, narrative structures and characterisation are inter-connected elements that enhance the understanding and analysis of written works. Textual narrative structures supplemented by digital graphical representations provide the framework through which stories are organised and presented, influencing the flow and impact of the narrative (Boyd et al., 2020). By examining the narrative structure of a text, students can learn to discern patterns, identify key plot points, and analyse the author's intended message (Willingham, 2004). Characterisation, on the other hand, brings the story to life through the depiction of characters and their traits, motivations, and relationships. By critically analysing the characters' actions, dialogues, and development throughout the narrative, students can delve deeper into the complexities of the story and gain insights into the underlying themes and social commentary. Critical reading skills enable readers to approach the text with a

discerning and analytical mindset, questioning assumptions, evaluating evidence, and interpreting the author's choices (Bishop, 2014; Smith Avendaño de Barón & González González, 2020). By using a drama-based strategy, the teacher creates an activity that serves to improve the critical thinking skills of the students in several ways: First, learning about character development or characterisation enables the student to think critically about how contextual challenges and opportunities can drive a fictional person/character's motives and behaviours. Additionally, understanding the context, as explained in Section 2.2.2, is pivotal to access the pragmatic reading level and achieve critical reading.

To promote and improve reading, the use of teaching activities for critical reading facilitates a continuous interaction and fosters improved teaching and learning processes. For instance, in an intervention by Lai et al. (2014), secondary school students improved their critical reading after a 3-year intervention design-based approach aimed at addressing the developmental disconnect between students' initial high levels of reading comprehension and subsequent low levels of achievement in secondary schools. The activities led to increased reading comprehension for students in the first 2 years of secondary school, while older students in their third year also demonstrated higher grades in national qualifications across different content areas. Such improvements were observed across diverse ethnic groups, school socioeconomic backgrounds, and school sizes. However, variations in achievement were influenced by students' initial reading levels and their specific school cohort. The significant improvements in national qualifications by the third year indicated that attainment rates aligned with the claim that the intervention was responsible for these positive changes. Yet, non-longitudinal interventions can also bring improvements to secondary school students. Benavides (2020) proposed the use of a digital form to help students move from semantic reading to pragmatic reading. This digital form helped the students to understand the type of text and the author's viewpoint by identifying the main ideas and the responses of other authors about the subject. Additionally, the form had a space where the student could visualise and synthesise both sets of ideas. By having the students fill in this form during reading, the researcher managed to help the students use their semantic understanding and use their critical thinking towards dissecting the texts, looking for the meaning *behind the lines*.

In addition to literacy teaching, the *Soap opera for critical reading* teaching strategy employs project-based learning, an instructional approach that focuses on student-centred learning through the completion of real-world projects. When students engage in project-based learning, they tend to develop a broader perspective of the context of the project; this broader perspective helps the student to think, enabling them to analyse, synthesise, and significantly evaluate complex issues (Yuni et al., 2023). ICT tools help open the students' views by enabling them to traverse digitally through faraway contexts and hear the people in them (Al-Shaye, 2021). The culmination of this critical thinking is a solution to the problems found, usually through the creation of original work by the students like the soap opera. Since the students actively researched the context and its problems while looking for a solution, project-based learning fostered independent learning and cultivated a genuine interest in the learning process.

First Step – the Importance of Context

The first step of the blended project-based strategy *Soap opera for critical reading* involved in-class critical reading lectures and several critical reading lessons presented by the teacher about dramatic texts. During these initial lessons, the learning foundations were laid by (a) explaining the purpose of the activity, which was writing a script using a beginning-development-end structure, where the characters' context drives the involvement and drive of each character; (b) presenting the key ideas and keywords; and (c) addressing the activity's schedule. This is relevant to the teacher's PCK, where he chose a strategy that would help develop the students' critical reading skills.

During this first step, the teacher used ICT via simple presentation software like PowerPoint to show new themes and keywords and display different movies or TV series that the students could recall and would find interesting and that followed the beginning-development-end structure. The teacher also provided an online repository of other content that was carefully curated for this strategy, which included different audio recorded in different contexts that could be accessed online by the students. These audiovisual aids served as examples of characterisation and narrative structures, providing the students with real-life cases of the themes studied. The use of ICT tools to bring geographically distant and culturally unique contexts to the classroom makes ICT tools especially relevant for the process of analysis of the context and subsequent

critical thinking (Benavides, 2020; de Barón, 2016), leading the reader towards achieving critical reading. For example, the visual and audio capacities of ICT help learners to appreciate the context of the place where the narrative in a text takes place by enabling them to both see it and hear it. This allows students to have a type of contact with and appreciation of those contexts that can hardly be reached by traditional print-based teaching. In the case of the *Soap opera for critical reading* strategy, the teacher provided different hyperlinks to the students where they could access different audio and visual examples of diverse contexts. With this information, students improved the characterisation process, understanding the context where each of the characters lived, how their context sounded, how it looked, and thus delimited more clearly how *this character* would be influenced and how they would think *in this determined context.* Then, the students mixed each of these characters as part of a story that followed the desired narrative structure. The *critical* reading process differs from the syntactic and semantic reading processes because when reading critically, it is expected that the reader achieves an understanding of the contextual nature of the language in which the text and the author are situated, giving each text a certain validity (de Barón, 2016; Guthrie & Klauda, 2014).

Second Step – Collaborative Work

Prepared with the concepts sampled in the first step, the second step of the teaching strategy *Soap opera for critical reading* was the students' group work, which was selected by the teacher based on their experience and PCK, since collaborative learning enables students to work with others as they read and write, openly discussing stories with peers and building their literacy skills with support in a collaborative environment. By working together in groups, students can develop strong communication and interpersonal skills. They learn to share ideas, listen to others, and resolve conflicts, fostering a cooperative environment. Additionally, collaborative learning promotes critical thinking and problem-solving abilities as students engage in discussions and analyse different perspectives (Al-Shaye, 2021; Behmer, 2005). This activity in the *Soap opera* strategy started with the students creating study groups; these groups researched and read about different social contexts until they selected one context. The selected context was where the story developed by the students was located, with each group writing an original story. Due to the COVID-19 restrictions at the time, this part of the strategy was developed to take advantage of online learning (described in Section 2.3.1).

Online learning was pivotal for the success of the strategy, as it not only sustained the communication between the teacher and the students but also provided the interactivity needed for the students to maintain the positive learning influence of the social context needed for learning (Arkorful & Abaidoo, 2015) during co-creation time (as explained in Section 2.1.3). During co-creation time, the students discussed and thought critically about how the story they were writing developed, how each character progressed, and how plausible these developments were in the social context chosen by each group, where the story was happening. The results of this co-creation time were collaboratively written stories that carefully considered the narrative structure and characterisation in a set context. This process allowed the students to understand how the context in which each story happens is relevant to *reading behind the lines* (pragmatic reading). The combination of online digital teaching and physical face-to-face teaching makes this a *blended strategy*, as it combines face-to-face instruction with computer-mediated instruction (see Section 2.3.2).

The teacher was available for support both in live sessions and through online communications like email and Zoom during the collaborative work. In this way, ICT enabled continued conversation between peers and scaffolding from the teacher when needed, even when faced with the limitations imposed during COVID-19. Because of the mix between face-to-face and online teaching, this strategy's nature is blended, thoroughly discussed in Chapter 2. Literature about the use of blended learning for literacy (Brown, 2013; Graham et al., 2013) claims it can support student learning in the areas of comprehension and fluency, strengthening students' metacognitive skills, critical thinking, and creativity. The blended-learning approach enables flexibility, allowing students to access content at their own pace and convenience. Additionally, the integration of multimedia and interactive elements enhances engagement and comprehension. Students receive personalised instruction and immediate feedback through online assessments, while maximising classroom time for interactive activities, discussions, and collaboration, fostering a dynamic and effective learning environment. For these reasons, the integration of ICT successfully enhances the teaching strategy. These benefits are plausible in the research of Yuni et al. (2023), whose seventh-grade students improved their abilities to critically form and express opinions after a blended literacy project that aimed to improve students' metacognitive skills and critical thinking and significantly affected students' ability to express themselves.

Third Step – From Word to Voice

The third step of *Soap opera for critical reading* was recording and editing the scripts. Writing and playing these soap operas enabled students to practise writing a cohesive story using characterisation to provide arguments about how the character would develop, depending on the character's given context. Afterwards, the students performed and recorded each script from home using the Windows voice recorder app. These recording were then edited using the Anchor app, with both apps previously introduced and explained by the teacher during virtual group sessions. This type of activity made students enthusiastic about sharing their thoughts and ideas, because they could express themselves in a captivating and familiar manner. They not only engaged as readers and writers but also as screenwriters, artists, designers, and directors. This shift allowed students to transition from being passive learners to active contributors in their learning process. This aligns with the principles of active learning, as it encourages student-centred approaches and interactive learning in technology-rich environments. In turn, this involvement fosters active learning and active participation among students (Behmer, 2005).

Drama has been used extensively in traditional literacy teaching and learning strategies (Udalla, 2020; Young et al., 2019). In Udalla (2020), who used a non-ICT-mediated strategy, results showed that using a theatre play enhances the teaching and learning approach by positively influencing different reading strategies like syntactic reading (turning text into meaning), summarising information for improving the fluency of speech, the activation of prior knowledge, and memorising. Similar positive consequences were shared in the research of Young et al. (2019), which found that the use of drama had a positive effect on students' vocabulary acquisition, word decoding, and reading comprehension, as it involved close reading and deep thinking about the text, which activated students' critical thinking, leading to a better understanding of the meaning implied in the script and improved comprehension. During drama pedagogical activities, students practised reading the script multiple times in rehearsals. Through these rehearsals, they worked on reading the words correctly and accurately for the purpose of performing. The words they encountered were within the context of the script, so they had contextual meaning, and both their peers and the teacher provided guidance to help them read the text smoothly and effortlessly.

While Udalla's (2020) contribution showcased the PCK behind theatre use in a traditional non-ICT format, the *Soap opera for critical reading* project in the current study adapted this traditional practice to a digital platform. Working in a digital platform allowed experimenting with the semantic reading, linking visual clues to make meaning in a given context. At the same time, this contextual knowledge implies the students improved their real-world understanding, developing decision-making skills, general semantic reading skills, and critical thinking skills. A similar set of results was described in the research of Al-Shaye (2021). This study included 103 third-year undergraduate university students who were taking advanced reading skills courses; they were divided into an experimental group receiving online digital storytelling instruction and a control group with traditional lecture-based teaching. The digital storytelling offered students authentic real-life experiences in a straightforward and meaningful manner, resulting in captivating and customised learning opportunities that notably enhanced the students' proficiency in critical reading.

Fourth Step – Presentation

Finally, the last step in the *Soap opera* strategy was the exposition of the students' production, a PCK approach that enabled the students to present their own stories and listen to their peers' offered suggestions and approval. After each play was finalised, the students uploaded their soap operas into a private channel on the internet-based audio platform Spotify (see Artefact 13, Figure 4.22). This process was also conducted under the tutelage of the teacher, who previously delivered a how-to lesson showing the students how to upload the recordings to the platform. With the students' soap operas uploaded and live, the result of this learning activity was a joint showcase of the student-produced soap operas through Spotify. The pedagogic objective of the soap operas was achieved: The students' storytelling showcased an improved understanding of the context in which characters are immersed, how the context acts upon and limits the characters, and how certain narrative structures help to drive the progression of a story and its characters.

5.4.2 Complexity and High Integration Teaching Strategies

The implementation of the *Soap opera for critical reading* strategy demonstrates a significant level of complexity. This complexity is evidenced by how the teacher used a large amount of interwoven ICT tools, which were specially curated by the

teacher to allow each part of the pedagogical strategy to be implemented and to enhance learning outcomes. Such understanding of how to embed different ICT tools (TK) to support different pedagogical strategies (PK) depending on their relevance to the subject content (CK) demonstrates a high integration of PK, CK, and TK by the teacher (Koehler et al., 2013). The fluency of using different ICT tools proves the participant's TPK knowledge and skills to understand how to use each of the platforms to communicate (presentation software, Zoom), write, research (the different links provided), record (voice recorder and Anchor apps), and play (Spotify), when to use them for a particular teaching activity, and which ICT tools work best at different moments of the pedagogical strategy to enhance the development of critical thinking skills. This complex scenario works thanks to the teacher's use of the teaching methodologies that were previously discussed as high level, their comprehension of critical reading (CK), and their use of various pedagogical skills (PK). This typifies a high level of TK, PK, and CK integration.

The main difference between the blended-learning strategy *Soap opera for critical reading* and the strategies described in the previous sections is the depth of TPK and TCK shown in the integration of the different software and devices used and their importance to the positive outcome to create, deliver, and assess (Puentedura, 2010). The sophisticated use of a wide array of software for this learning strategy is directly related to the use of ICT that teachers described both in school and outside of it, as shown in Table 5.4. The TPK shown is not only related to the typical educational or productive software for teaching like word processors and presentation software, like in the intermediate level of integration. Instead, TPK and TCK at the high integration level involves engagement with non-educational software and content. The teachers who achieved a high-level of integration described how they use digital content during leisure time and how some of this content transcends from leisure and gets included in their teaching strategies (Vitanova et al., 2015).

In the specific case of the *Soap opera for critical reading* strategy, the teacher used a podcast series that discusses the lives of different Spanish speakers in remote places. Through interviews, this podcast served to illustrate in Bogotá's classrooms how people in different contexts sound, the problems they perceive and face, and how they act. This podcast was part of the contextual teaching used in class during the first step described earlier, when the teacher was presenting the project and its scope, and

it not only served to present a different context but also enabled the teacher to lead a critical conversation about how each context affects people, and in literature, how it affects the characters (Al-Shaye, 2021). Additionally, the teacher also had different episodes or podcasts about different contexts, thus allowing the students to cross-relate and analyse each context collaboratively and against their own (Benavides, 2020). The reach of this kind of learning experience would be very difficult and expensive to create without the ubiquitous access granted by ICT tools, which in turn would make it harder for the students to understand new, faraway contexts.

Furthermore, the teacher also demonstrated high TPK integration in the timing of the use of each app and software. For instance, in the first step of the soap opera production, students were given the opportunity to *play* or familiarise themselves with the voice recording app and the Anchor editing software in the classroom, where they could seek guidance from the teacher. This approach ensured that when the students were ready to record their soap operas, they already possessed prior knowledge of how to use the software for recording and editing (Cabi, 2018). If they encountered any difficulties or forgot certain steps, they could refer to the instructional materials provided by the teacher or seek assistance online.

The demonstration of PCK was manifest in the implementation of an active-learning strategy where students actively participated in constructing a radio soap opera. Guided by the teacher, students engaged in a collaborative creation exercise using digital tools to collect data, co-create texts, and record audio, followed by presenting their work in class. This approach aligns with the concept of active education by Rosenshine (2012) study discussed in Section 2.1, emphasizing the teacher's role as a facilitator in motivating literacy through well-connected activities that prompt active learning. This interactive teaching method, employing visual and dynamic materials, empowers students to construct knowledge independently and in collaboration with peers and teachers, contextualizing written content to create their understanding (Gee, 2007). In the context of critical reading, the interconnection of narrative structures and characterizations enhances comprehension. Utilizing digital graphical representations alongside textual narrative structures organizes and presents stories, influencing narrative flow and impact (Boyd et al., 2020). Analysing narrative structure allowed students to identify patterns, plot points, and interpret the author's

message, while character analysis delves into character traits, motivations, and relationships, providing insights into underlying themes and social reality.

At the same time, the PCK sophistication to create learning scenarios in the blended-learning strategy *Soap opera for critical reading* contradicts the claims from the literature about average Spanish language literacy teachers in public Colombian schools. A research paper by de Barón (2016) discussing Colombian literacy education describes teachers' limited and sometimes misguided understanding of critical reading. In consequence of this lack of understanding, the teachers focused mainly on interpretation and argumentation while neglecting reflective, evaluative, and critical thinking processes and writing exercises, while also leaving behind the analysis of contextual factors needed to achieve critical reading. On top of that, de Barón (2016) also found how the proposed traditional strategies for enhancing critical reading practices lacked emphasis on communication, writing, and the role of different stakeholders, leading to lessons mainly based on the guidebook without involving student work or promoting collaborative learning. The teachers described by de Barón (2016) were public school teachers from a small city in Colombia; thus, the context where they taught was different from that of the teachers interviewed for this thesis. As described before, the context where teachers teach is pivotal for understanding their capacities, but also the schools' hiring processes. Public schools do not enjoy the same access to high PCK teachers (Gamboa & Londoño, 2014), which is evidenced in the teachers' capacities.

In the other hand, the use of ICT tools in the learning strategy *Soap opera for critical reading* presents a high-level integration of TPACK; this also implies that the implementation of such a strategy would not be possible without the use of the ICT tools that are integrated in it. This is evident, first, in the communication enabled through digital channels, which was pivotal for the strategy in the blended-learning scenario that was mandatory through COVID-19 restrictions. Nevertheless, and as described in each of the steps, there is evidence on how the ICT tools also enhanced the teaching/learning process. By using hyperlinks to provide students with diverse audio and visual examples of various contexts, the students deepened their characterisation process, understanding how characters are influenced by and think within their specific contexts. Such engagement allowed students to appreciate and connect with contexts beyond what conventional teaching methods can offer. The

teacher provided support through live sessions, email, and Zoom during collaborative work, using ICT to continue communication and guidance even during COVID-19 limitations. Finally, working in a digital platform allowed students to experiment with pragmatic reading by linking visual clues to understand meaning in a given context. This further improved their real-world understanding and decision-making skills, as well as enhancing their general semantic reading and critical thinking abilities.

Regarding the TK, TPK, and TCK presented by the teacher in the *Soap opera for critical reading* strategy and through the interview, there is a clear difference from the literature found and discussed: the literature review presented in this thesis reports how teachers usually state feeling low confidence about their capacities to use TK and its integrated knowledges for creating pedagogical strategies suited for their teaching objectives (Lin et al., 2013). These differences are also evident when comparing the literature with the teacher's CK and PK use and understanding, as Smith Avendaño de Barón and González González (2020) described how teachers in their research barely used engaging materials to improve motivation and critical reading of their students, such as the audiovisual aids used in high ICT integration levels, including ICT-driven e-learning resources.

In the current study, teachers described having an appropriate CK, PK, and PCK. Thanks to these levels of understanding, they were able to employ diverse teaching approaches tailored to the curriculum and students' needs, including the integration of ICT tools to some extent, which depended on their TK. One teacher stood out for their high-level integration of TPACK in their blended-learning strategy *Soap opera for critical reading*. This strategy involved critical reading lectures, collaborative co-creation sessions, and the use of ICT tools for data collection, text creation, and audio recording. The use of drama, specifically soap operas, improved literacy by positively influencing reading strategies and enhancing understanding of narrative structures. This sophisticated approach contradicted previous literature that highlighted limited understanding of critical reading among Spanish language literacy teachers in Colombian schools.

The use of a wide array of software and devices in this strategy, with each introduced at an appropriate time in the sequence of learning, demonstrated the teacher's TK and TPK integration. The study highlights the importance of ICT tools for high-level integration of TPACK and how high-level integration strategies diverge

from existing literature. This approach provided authentic real-life experiences in a simple and meaningful way, leading to engaging and personalised learning opportunities that significantly improved students' critical reading proficiency. This fluency in utilising different ICT platforms underscores the participant's TPK and his willingness to use it, enabling effective communication, writing, research, recording, and interactive engagement. Moreover, the strategic application of these tools throughout the pedagogical strategy highlights the teacher's deep understanding of critical reading and their proficient use of varied pedagogical skills, further exemplifying the succesful integration of TK, PK, and CK to teach.

5.5 Summary

In this study about how Spanish literacy teachers integrate ICT to teach critical reading in private secondary schools in Bogotá, teachers exhibited three levels of ICT integration: basic, intermediate, and high. At the basic level, teachers used ICT tools mainly for administrative tasks and to improve communication of traditional teaching methods. While this provided some administrative benefits, it did not fully harness the potential of ICT for improving student learning. Discrepancies between teachers' self-perception of their TK and their actual integration skills suggest a gap in understanding, with more experienced teachers showing less confidence in integrating technology to create active-learning scenarios.

At the intermediate level of ICT integration, teachers significantly modified teaching and learning practices to promote active and collaborative learning. They selected and integrated ICT tools into pedagogical strategies, going beyond basic technology usage. For example, in teaching critical reading, teachers used tools like Padlet, which facilitated peer learning and collaboration, and Kahoot!, which promoted active participation and motivation. While teachers demonstrated advanced use of ICT tools, there is still room for improvement in their TK to expand the integration of ICT tools in education.

At the high level of integration, teachers employed diverse teaching approaches using ICT tools, showcasing deep CK and PK and good TK. One notable strategy involved critical reading lectures, collaborative creation of soap opera scripts, and the use of various ICT tools for data collection, text creation, and audio recording. This strategy fostered narrative skills and critical thinking among students, contradicting

previous literature that highlighted limited understanding of critical reading among Spanish language literacy teachers.

The findings indicate that the process of integrating ICT tools into teaching requires effort and dedication from teachers. It is not a skill that can be easily acquired. The level of complexity in integrating ICT tools depends on various factors, including the teachers' commitment and availability of time, as well as their capacity and expertise in using technology. The willingness and capacity of teachers to integrate ICT tools into teaching is also influenced by the specific context and infrastructure in which the integration takes place, plus the goals of the teaching strategies that incorporate ICT. In essence, the successful integration of ICT into teaching practices is a multifaceted process that requires both willingness and capabilities of teachers, institutions, and policymakers.

This study concurs with the literature emphasising the importance of a supportive infrastructure and organisational policies to facilitate technology integration. Teachers who have the necessary support are more likely to integrate ICT into their teaching practices. Professional development programs that focus on developing TPACK can enhance teachers' confidence and willingness to integrate ICT, leading to improved learning outcomes like the ones found in the intermediate and high levels of ICT integration.

Chapter 6: Conclusions

This study has investigated how Spanish literacy teachers integrate ICT to teach critical reading in private secondary schools in the city of Bogotá.

This chapter provides the findings derived from the conducted research. It begins with a summary of the study in Section 6.1, encompassing an overview of the context, literature review, methodology, results, and discussion chapters. The objective is to establish connections for readers, emphasizing the significance of this study in the context of relevant professional practice. Section 6.2 delves into a discussion of the contributions made by the research to the knowledge in the field of integrating ICT into critical reading teaching. Section 6.3 discusses limitations of the study and proposes how teachers need an ongoing development program to create or improve their technology knowledge and skills to integrate ICT into their teaching strategies. Finally, Section 6.4 offers concluding remarks.

6.1 Synopsis

6.1.1 Context

The city of Bogotá was the location of this study. It is the capital and largest city of Colombia, with a significant population and educational system. Despite high enrolment rates, the quality of education in Bogotá, particularly in language skills, is a concern. Standardised tests have shown that a large percentage of students in secondary school fall below the expected minimum level of language proficiency. To address this situation, the city's education authorities have implemented various programs and policies to address disparities in education, particularly in terms of infrastructure through connectivity and improved coverage. However, the pedagogical aspects of integrating ICT for learning have received less attention.

Nevertheless, inequalities in access to and use of ICT are a significant challenge in developing economies like Bogotá. Despite efforts to provide access to technology, the city still faces issues such as limited internet connectivity and lack of basic digital skills. Policymakers in underdeveloped societies face unique challenges, including infrastructure limitations and the need to adapt pedagogical solutions to their specific

context. Implementing effective policies requires a combination of technological innovations, innovative pedagogies, and authentic literacy content to improve educational outcomes. While the city has made progress in its communications infrastructure, there is still room for improvement in terms of broadband speed and network competitiveness that allow the use of ICT tools to promote social inclusion and economic competitiveness.

In today's pedagogy, the focus has shifted from the traditional teacher-centred approach to a student-centred approach. The aim is to enable students to construct their own understanding and knowledge by actively participating in learning activities. This active-learning process involves students engaging with the learning content, applying problem-solving skills, and developing critical thinking abilities in a safe learning environment. Three key principles of modern teaching include active student participation, learning within a contextual framework, and the teacher's role as a facilitator and designer of learning experiences. Education is seen as an active process where students assimilate information through direct experiences, recognise mistakes, and seek solutions. The social context also plays a crucial role in knowledge acquisition, as individuals interact with others, artefacts, and ideologies to construct meaning. Cooperative and group learning are encouraged, as they promote social interaction and the shared construction of knowledge. The teacher's role is to provide scaffolding and support to facilitate learning, gradually transitioning from an instructor to a facilitator. The use of technology, such as flipped classrooms, can enhance active-learning experiences. Ultimately, after these changes in pedagogy, teaching has become a collaborative process, where the teacher works with students to co-create knowledge in a given environment. As such, the professional endeavour of the teacher is to create the spaces where each student can thrive, learning every given subject at their own pace while being guided by the teacher.

In the Colombian education context, critical reading is emphasised, focusing on the comprehension, interpretation, and evaluation of verbal and non-verbal texts. Critical reading encompasses semantic, syntactic, and pragmatic components, where readers extract meaning from explicit and implicit information, consider the social context, and construct their own interpretations. Developing critical reading skills in secondary schools is critical for students' understanding of the world, promoting reasoned argumentation, and empowering them to question and improve their societies. Given the

above, teachers are well trained in critical reading, and considering the participants in this study were from private schools, they demonstrated a high level of CK, addressing sub-question 3, *What is the subject content knowledge competency level of secondary school Spanish literacy teachers in Bogotá*? Teachers play a significant role in improving students' reading comprehension through pedagogical strategies, instructional support, and engagement. Various pedagogical interventions, including scaffolding, collaborative activities, and social mediation, have been shown to enhance reading skills and motivation among secondary school students, which provides examples of pedagogical knowledge, addressing sub-question 2, *What is the pedagogical knowledge competency level of secondary school Spanish literacy teachers in Bogotá?*. Colombian teachers have been trialling use of technology-based instruction for some time with mixed outcomes. As found in this study, teacher knowledge and skill to integrate ICT ranges from low to high, with four teachers at the low level, four at medium level and one at the high level of integration, indicating a relevant gap among teachers' ICT integration current capabilities, and answering sub-question 1, *What is the competency level of secondary school Spanish literacy teachers in Bogotá to integrate ICT to teach critical reading?*

6.1.2 ICT

The last two decades have witnessed significant advancements in education technology globally, driven by broader innovations in ICT. These innovations have revolutionised teaching and learning processes by providing instant access to vast repositories of information and facilitating communication. Policymakers and international agencies have recognised the potential benefits of ICT in education, such as inclusivity, efficiency, and innovation.

Generally, the integration of ICT in education, and in particular in Spanish language learning, poses challenges for the Colombian education stakeholders. While there are challenges of physical access to infrastructure and necessary hardware for many public schools, the private schools are better provisioned in this regard. To address this, a BYOD scheme has been adopted, where students provide their own devices for academic purposes. Nonetheless, the digital divide continues to be a concern, as not all students have equal access to high-quality hardware and software, leading to inequalities based on socioeconomic status and geographic location.

Within teaching strategies, blended-learning and flipped-classroom approaches have gained prominence worldwide, and some of Bogotá's classrooms share these strategies. Blended learning combines online digital teaching with face-to-face instruction, enabling the teacher to have the best of the face-to-face interaction and collaborative work, while enhancing the experience with the online presence. These strategies have shown positive impacts on student attitudes, motivation, and learning outcomes, although challenges related to student concentration and access to resources may limit their effectiveness, especially in economically disadvantaged contexts. An example of this type of strategy was thoroughly discussed in Chapters 4 and 5 under the name *Soap opera for critical reading*. In this example, the students were tasked with writing a script, taking special care to understand the context and how a context can change the perspective of a character.

Another approach, DGBL, uses digital games to enhance learning experiences by increasing student motivation and engagement. DGBL provides meaningful learning experiences through challenging tasks, feedback mechanisms, and scaffolding, which translates to students' improved engagement in critical reading lessons. However, the successful implementation of DGBL requires careful design and consideration of instructional goals, and some teachers debate what games are the best to teach critical reading. Such debate emanates from the speed and lack of depth in some games (e.g., Kahoot!) described by this study's interviewees. In conclusion, ICT integration in education offers immense potential, but it also demands attention to address challenges related to infrastructure, the digital divide, teaching strategies, and the design of effective learning materials.

6.1.3 TPACK

The integration of pedagogy, content, and technology is essential for language teachers to effectively integrate ICT tools and help students achieve critical literacy. Mishra and Koehler's (2006) TPACK framework provides a basis for understanding and applying subject content, pedagogical strategies, and technology in meaningful ways. The framework emphasises the need for teachers to develop a deep understanding of discipline content (CK), pedagogical knowledge (PK), and technological knowledge (TK). These three core knowledge areas intersect to create additional knowledge types, including PCK, TCK, and TPK. The effective integration

of TPACK knowledge types can enhance teaching practices and facilitate student learning. However, challenges such as the evolving nature of technology and the need for continuous teacher training and adaptation must be addressed to ensure successful implementation of ICT in schools. The TPACK framework provides a valuable tool for teacher training and planning to meet the demands of the 21st-century classroom.

6.1.4 Results

This study's findings indicate that participants had a strong base in PK and CK, but that TK differed depending on each teacher, with each having different levels of expertise and capacity to integrate ICT into their teaching. These levels are differentiated by how the integration of ICT enhances the learning of the students. At the basic integration level, teachers only use ICT to replace paper, without fully utilising the benefits of having a strong infrastructure and connectivity. At the intermediate level, teachers integrate ICT in a way that creates improved learning outcomes. For example, one participant used the Padlet platform for co-writing exercises, highlighting the importance of technology in enhancing writing processes and student comprehension through collaboration. With regards to the key question driving this research, *How do Spanish literacy teachers integrate ICT to teach critical reading in private secondary school settings of Bogotá?* Some teachers demonstrated a high level of technology integration, redesigning their pedagogical strategies significantly with the use of ICT tools. This sophisticated approach exemplifies a holistic TPACK, enabling students to enjoy several learning steps that help them actively and collaboratively develop their critical thinking skills and become critical readers. Additionally, teachers require support and professional training to effectively integrate ICT into their teaching practices. This training aids in enhancing their TK, either by filling the gaps in their college education or by staying updated with the latest developments.

6.2 Contributions of the Study

6.2.1 Contributions to General Knowledge About ICT

The findings suggest that the integration of ICT tools requires willingness, time, and capacity on the part of literacy teachers. This study adds to the overall knowledge

base regarding the incorporation of ICT tools into the realm of literacy education, particularly within the context of critical reading in the Spanish language at the secondary school level. The results highlight that acquiring the skills necessary for effectively integrating ICT tools into teaching is a challenging task. Instead, successful ICT integration into teaching relies on support from the educational context, involving stakeholders and institutions, whose collaborative support ensures the availability of essential infrastructure and connectivity, establishing an environment in which enthusiastic and inquisitive teachers can enhance their technological skills. However, it is essential to acknowledge that this growth in technological proficiency demands the teacher's investment of time and willingness to roam outside their comfort zones and experiment with ICT, looking to improve their teaching strategies and outcomes. The level of ICT integration within pedagogical strategies ultimately hinges on educators' skills in incorporating ICT tools into their unique instructional contexts. This proficiency manifests itself in varying degrees of complexity across different teaching approaches and strategies, reflecting the diverse landscape of pedagogical practices.

Results also indicate that complexity levels of integration vary based on context and strategy purpose. Building upon the technology skills of each teacher, the findings indicate that the integration of ICT tools occurs at different levels labelled as low, intermediate, and high, depending on their complexity. The findings also highlight how the strategies labelled under any of these integration levels are possible irrespective of the teaching methods and strategies employed to teach critical reading. Such findings were reinforced through analysing artefacts in combination with the interviews, which proved how teachers use a vast array of ICT tools, including different hardware and software like office programs, Kahoot!, Padlet, and Nearpod, and how the integration of any tool does not directly imply an integration level.

This study makes significant contributions to the understanding of ICT integration in the field of education, highlighting the pivotal role of a supportive context. This context includes infrastructure, policies, training, and support to foster teachers' willingness to embrace technology for improved pedagogy. The research also found that while privileged schools in Bogotá recognise the importance of ICT tools and possess the necessary resources, integration levels can vary among teachers, emphasising the need for attitude transformation, particularly among those with strong

PK and CK, but relatively week TK. Moreover, the study emphasises the importance of both preservice and in-service teacher training in enhancing TK for teaching. These findings collectively contribute to the broader understanding of effective ICT integration in education and provide insights into fostering a supportive environment for teachers to harness the potential of technology in teaching and learning.

6.2.2 Contributions to TPACK Applications in Critical Literacy

This study makes a valuable contribution to the overall comprehension of the extensive utilization of the TPACK framework in incorporating ICT into critical literacy education. The results underscore the importance of literacy teachers' proficiency in content, pedagogy, and technology, along with their capacity to seamlessly integrate these areas of knowledge. It is crucial for teachers to possess the adeptness to effectively integrate these types of knowledge to facilitate student learning. This can be achieved through designing activities that integrate ICT tools that actively scaffold students in their active learning and create a favourable learning context. These factors are crucial in advancing 21st-century teaching and learning practices.

This study's results demonstrate that teachers are skilled at employing a diverse range of strategies to teach literacy, considering and catering to students' grade levels, individual requirements, and varying levels of critical literacy skills. This variation in strategies relates to different aspects of the TPACK framework, including how PCK and TCK integrations occur.

Moreover, the analysis of artefacts revealed how teachers' technology knowledge enables teachers to develop various pedagogical strategies: Some teachers use technology to enhance traditional teacher-centred approaches or to make their grading and reporting easier, representing low-level integration of ICT to teach. Conversely, other teachers exhibit more advanced and progressive integration of ICT into their teaching strategies, where technology tools play a central role as part of the pedagogic approach intended. These intermediate-level and high-level integration strategies would not be feasible without the inclusion of ICT tools or without the teacher's high TPK level.

Consequently, with the findings about general ICT, the successful integration of ICT tools for teaching hinges on various contextual factors or XK. The context plays a pivotal role, as teachers require not only the necessary infrastructure in schools to

facilitate the adoption of digital tools, but also the TPACK-related knowledge acquired through university education and continued training programs.

6.2.3 Contributions to Practice

As discussed in Chapter 1, there is a lack of research on the educational context in Bogotá DC, particularly at the secondary school stage, as most studies have focused on primary and university stages. Moreover, there is limited research specifically addressing critical reading in Bogotá. This study aimed to fill this gap by providing empirical evidence on the perceptions and practices of Spanish language literacy teachers in this under-researched context, which may be applicable to similar institutions. The study can support and influence the national agenda concerning the integration of technology into teaching and learning, as mandated by educational institutions across the city. Additionally, the findings can serve as a valuable reference for private schools, assisting them in making informed decisions, particularly regarding the implementation of effective professional training programs for their teaching staff and to improve their infrastructure and access to licensed software. The teacher training programs will need to be tailored to each bounded case, characterized by their focus on practical, hands-on experiences and pedagogical strategies that empower educators to effectively integrate technology into their teaching practices. These programs provide teachers with opportunities to explore a variety of digital tools and platforms relevant to their subject areas and teaching objectives. Additionally, they offer ongoing support and mentoring to help teachers develop the necessary skills and confidence to leverage technology in meaningful ways to enhance student learning. Additionally, connectivity to the web was the most common issue reported. In consequence, assuring that the teachers have easy access to a stable broadband connection will keep them motivated and willing to continue engaging and experimenting with new ways to create ICT mediated teaching, which is pivotal towards them achieving a high level of ICT integration.

Moreover, this research study has significantly contributed to the field of data collection by adapting to the challenges posed by the COVID-19 pandemic and the travel restrictions experienced in 2020 and 2021. The study effectively utilized Zoom as a technology-driven platform for data gathering. Instead of traditional face-to-face interviews, the research opted for semi-structured interviews conducted through

Zoom. This decision was a pragmatic response to travel constraints imposed by the pandemic, proving to be an efficient method for collecting data. Furthermore, the study acquired and analysed samples of teaching materials to support the insights obtained during the interviews. These data collection methods offer advantages such as reduced travel expenses while upholding the integrity and quality of the collected and analysed data. These innovative approaches, designed to meet the demands of unprecedented circumstances, hold the potential for broader application in situations where conducting new research may be challenging due to budgetary constraints.

Finally, this study found that teachers' ICT integration strategies vary from basic integration that simplifies teachers' workloads to more advanced levels that enhance teaching practices. As a result, this study offers valuable insights for literacy teachers and policymakers, guiding them in adopting innovative strategies that blend diverse teaching techniques and harness new ICT tools. This, in turn, has the chance to support students in developing critical literacy skills crucial for success in the contemporary world. Furthermore, the results advocate for increased investment by the IB schools in technology infrastructure, management, and the development of suitable ICT strategies, courses and infrastructure.

6.3 Limitations and Suggestion for Further Research

6.3.1 Limitations of the Study

As with any research, this study has inherent limitations that need consideration for a comprehensive interpretation of the findings. Recognizing these limitations when applying the results to practical settings is crucial to avoid overstated claims. While the outcomes of this study may be relevant within a specific theoretical discourse, generalizing the findings from a case study involving nine participants in privileged private schools to the broader school population in Bogotá or other contexts is not feasible. Nevertheless, the insights derived from this study can offer valuable perspectives and serve as a foundation for further exploration into the challenges of integrating ICT in other contexts. It's important to acknowledge the gradual nature of this process, as indicated by the three levels of teacher capacity for integration, basic, intermediate and high. Teachers need support to develop their capacities, and the correct infrastructure to teach and learn.

The primary objective of this study was to understand how literacy teachers perceive the knowledge and skills necessary for incorporating technology into critical reading instruction, guided by the TPACK framework (Mishra & Koehler, 2006). While the study concentrated on a singular case, there are other analogous studies that, when combined, contribute to a more profound comprehension of challenges associated with ICT integration.

A second limitation of the study relates to critiques of the TPACK framework, including potentially ambiguous definitions of its components and the difficulty of defining boundaries between them. Mishra and Koehler (2006) assigned equal significance to all eight TPACK areas, acknowledging their singular and joined natures. The data collected in this study offers evidence of technology being utilized to formulate innovative tasks and involve students in active-learning activities, thereby facilitating the development of critical reading skills. This finding reinforces the ideas by Mishra and Koehler (2006) about the role of teacher's for integrating ICT into teaching strategies, indicating the need for multiple types of knowledge to navigate and implement the technology integration effectively.

6.3.2 Further Research Suggestions

TPACK has been used as a framework in many ICT studies and in a wide range of subject areas. Most of these studies have been in English-speaking countries. This study adds to the existing knowledge on integrating ICT into teaching and learning by examining teachers' perceptions and practices in Spanish language classrooms. The findings reveal that, like English teachers, Spanish teachers use ICT tools at varying levels, with some using basic applications for communication and presentations, while others employ more complex strategies that integrate different software to enhance specific learnings. However, the study highlights that the quality of teaching and learning primarily depends on teachers' PK, their ability to effectively communicate the subject content, and providing opportunities for students to develop critical reading skills.

For private schools, it is recommended that teachers receive training to overcome any general challenges they may face, with a special emphasis on the use and understanding of ICT tools. While some teachers already use digital technologies in their daily work, the focus should shift towards leveraging the full benefits of ICT for

teaching purposes. Professional development programs should aim to strengthen teachers' knowledge and skills from their contextual knowledge into the remaining three areas: TK, PK, and CK. Such comprehensive training could enhance the effectiveness and meaningfulness of their teaching practices. Additionally, the study emphasises the need for progressive and cumulative professional development, which should be supported by the schools to support teachers in effectively integrating technology into their instructional strategies.

Furthermore, progressive and cumulative professional development should be made available for every teacher in Bogotá, regardless of the subject they teach, the school year level, or the type of school. This professional development comprises 1. Courses and topics specially tailored for the context of each school, grade and teacher; 2. Should provide the necessary contents for learning; 3, should secure the access to licenses needed for the teachers to use their newly acquired abilities, and 4; will offer ongoing support and mentoring to help teachers develop the necessary skills and confidence to leverage technology in meaningful ways to enhance student learning. Thus, policymakers should take note of the infrastructure developed by the private schools and start the journey towards improving the infrastructure as they are doing now, but they must remember that teachers are at the centre of teaching, and it is through them that the infrastructure develops into strategies that teach effectively. If the teachers are not trained in using ICT tools, no amount or quality of infrastructure will be sufficient to achieve the learning needs of the students, whether in helping them become critical thinkers and readers or in other learning areas.

6.4 Concluding Comments

This study is the first of its kind in the selected context. It aimed to investigate a largely unexplored reality, how Spanish language teachers in Bogota's IB private secondary schools integrate ICT to teach critical reading. This exploratory research has provided useful evidence to understand several phenomena, including how teachers choose and integrate different ICT tools into their teaching strategies in a bounded context; how teacher's expertise to integrate TPACK related knowledge into their critical reading strategies ranges from low to high level depending on the ICT tools integrated and the complexity of their use to enhance teaching/learning, and; how teachers have context-specific needs, specially of a basic infrastructure and ongoing

training in order to effectively explore ICT and then integrating them in the classroom. Keeping these contextual issues in mind, this research provides a frame of reference for policymakers, schools, and teachers to review the current ICT use and integration, including strengths, weaknesses, and gaps that need to be considered in order to successfully integrate ICT into general teaching, as well as to the particular theme of this thesis, how to teach critical reading integrating ICT tools. This information should be used to improve future attempts to integrate ICT to create learning scenarios that support the acquisition of critical reading skills by secondary school students in Bogotá.

References

Abu-Hardan, F., Al-Jamal, D. A., & Sa'di, I. T. (2019). TPACK: Time to be considered in teaching reading. *International Journal of Learning, Teaching and Educational Research, 18*(6), 68-95.

Adu, P. (2019). *A step-by-step guide to qualitative data coding*. Routledge.

Afzal, M., Malik, M., Begum, I., Sarwar, K., & Fatima, H. (2012). Relationship among Education , Poverty and Economic Growth in Pakistan : An Econometric Analysis.

Al-Shaye, S. (2021). Digital Storytelling for Improving Critical Reading Skills, Critical Thinking Skills, and Self-Regulated Learning Skills. *Cypriot journal of educational sciences, 16*(4), 2049. https://doi.org/10.18844/cjes.v16i4.6074

Alivi, J. S. (2019). a Review of Tpack and Samr Models: How Should Language Teachers Adopt Technology? *Journal of English for Academic and Specific Purposes, 2*(2), 1-11.

Allen, I. E., & Seaman, J. (2016). *Opening the Textbook: Educational Resources in US Higher Education, 2015-16*. ERIC.

Ally, M., & Tsinakos, A. (2014). *Increasing access through mobile learning*. Commonwealth of Learning (COL);.

Altun, S. (2015). The effect of cooperative learning on students' achievement and views on the science and technology course. *International Electronic Journal of Elementary Education, 7*(3), 451-468.

Arévalo Duarte, M. A., Gamboa Suárez, A. A., & Hernández Suárez, C. A. (2016). Políticas y programas del sistema educativo colombiano como marco para la articulación de las TIC. *Aletheia. Revista de Desarrollo Humano, Educativo y Social Contemporáneo, 8*, 12-31. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S2145-03662016000100001&nrm=iso

Arias, E., & Cristia, J. E. (2018). BID y la tecnología para mejorar el aprendizaje:¿ cómo promover programas efectivos? 2014. *Disponible en:< Disponible en: https://publications. iadb. org/en/publication/17450/idb-and-technology-education-how-promote-effective-programs>. Acceso en, 2*.

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance Learning, 12*(1), 29-42.

Asterhan, C., Resnick, L., & Clarke, S. (2015). *Socializing Intelligence Through Academic Talk and Dialogue*. American Educational Research Association. http://ebookcentral.proquest.com/lib/qut/detail.action?docID=4866316

Azevedo, R., Cromley, J. G., Moos, D. C., Greene, J. A., & Winters, F. I. (2011). Adaptive content and process scaffolding: A key to facilitating students' self-regulated learning with hypermedia. *Psychological Test and Assessment Modeling, 53*(1), 106.

Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research & Method in Education, 5*(6), 66-70.

Bando, R., Gallego, F., Gertler, P., & Romero, D. (2016). *Books or Laptops? The Cost-Effectiveness of Shifting from Printed to Digital Delivery of Educational Content*.

Baralt, M. (2012). 12 Coding Qualitative Data. *Research methods in second language acquisition*, 222.

Baran, E., Chuang, H.-H., & Thompson, A. (2011). TPACK: An Emerging Research and Development Tool for Teacher Educators. *Turkish Online Journal of Educational Technology - TOJET, 10*(4), 370-377.

Bedoya, M. E. A., & Arango, P. E. (2012). Constructivismo y construccionismo social: Algunos puntos comunes y algunas divergencias de estas corrientes teóricas. *PROSPECTIVA. Revista de Trabajo Social e intervención social*(17), 353-378.

Behmer, S. (2005). Literature review digital storytelling: Examining the process with middle school students. Society for Information Technology & teacher education international conference,

Benavides, L. P. (2020). Estrategia pedagogico-didactica para promover la lectura critica/Pedagogical-Didactic Strategy to promote critical reading/Estrategia pedagogica-didatica para promover a leitura critica [Article]. *Educación, 29*, 146+. https://link.gale.com/apps/doc/A624881506/AONE?u=qut&sid=bookmark-AONE&xid=dcc9ceea

Benson, S. N. K., & Ward, C. L. (2013). Teaching with technology: Using TPACK to understand teaching expertise in online higher education. *Journal of Educational Computing Research, 48*(2), 153-172.

Bertrand, W. E. (2010). Higher education and technology transfer: the effects of "technosclerosis" on development. *Journal of International Affairs*, 101-119.

Beschorner, B., & Woodward, L. (2019). Long-Term Planning for Technology in Literacy Instruction [Article]. *Reading Teacher, 73*(3), 325-337. https://doi.org/10.1002/trtr.1828

Bishop, E. (2014). Critical literacy: Bringing theory to praxis. *Journal of Curriculum Theorizing, 30*(1).

Blackwell, C., Lauricella, A., & Wartella, E. (2016). The Influence of TPACK Contextual Factors on Early Childhood Educators' Tablet Computer Use. *Computers & Education, 98*. https://doi.org/10.1016/j.compedu.2016.02.010

Bloomberg, L. D., & Volpe, M. (2016). *Completing your qualitative dissertation : a road map from beginning to end* (Third edition. ed.). SAGE.

Bloomberg, L. D., & Volpe, M. (2018). Completing your qualitative dissertation: A road map from beginning to end.

Blundell, C. N., Mukherjee, M., & Nykvist, S. (2022). A scoping review of the application of the SAMR model in research. *Computers and Education Open, 3*, 100093. https://doi.org/https://doi.org/10.1016/j.caeo.2022.100093

Bokhove, C., & Downey, C. (2018). Automated generation of 'good enough' transcripts as a first step to transcription of audio-recorded data. *Methodological Innovations, 11*(2), 2059799118790743. https://doi.org/10.1177/2059799118790743

Bonwell, C. C., & Eison, J. A. (1991). *Active Learning: Creating Excitement in the Classroom. 1991 ASHE-ERIC Higher Education Reports*. ERIC.

Bornmann, L., & Mutz, R. (2015). Growth rates of modern science: A bibliometric analysis based on the number of publications and cited references. *Journal of the association for information science and technology, 66*(11), 2215-2222.

Botha, J. (2016). Digital equity and social justice: Whose reality? Reflections from South Africa. 33rd International Conference of Innovation, Practice and Research in the Use of Educational Technologies in Tertiary Education,

Boyd, R. L., Blackburn, K. G., & Pennebaker, J. W. (2020). The narrative arc: Revealing core narrative structures through text analysis. *Science advances, 6*(32), eaba2196.

Brand, B. R., & Moore, S. J. (2011). Enhancing Teachers' Application of Inquiry-Based Strategies Using a Constructivist Sociocultural Professional Development Model. *International Journal of Science Education, 33*(7), 889-913. https://doi.org/10.1080/09500691003739374

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101.

Breton, T. R. (2013). The role of education in economic growth: theory, history and current returns. *Educational research (Windsor), 55*(2), 121-138. https://doi.org/10.1080/00131881.2013.801241

Brown, S. (2013). A blended approach to reading and writing graphic stories. *The Reading Teacher, 67*(3), 208-219.

Brun, M., & Hinostroza, J. E. (2014). Learning to Become a Teacher in the 21st Century: ICT Integration in Initial Teacher Education in Chile. *Educational Technology & Society, 17*(3), 222.

Brush, T., & Saye, J. (2009). Strategies for preparing preservice social studies teachers to effectively integrate technology: Models and practices. *Contemporary Issues in Technology and Teacher Education, 9*(1), 46-59.

Bulman, G., & Fairlie, R. W. (2016). Technology and Education. In (Vol. 5, pp. 239-280). https://doi.org/10.1016/B978-0-444-63459-7.00005-1

Bustamante, C. (2020). TPACK-based professional development on web 2.0 for Spanish teachers: a case study. *Computer Assisted Language Learning, 33*(4), 327-352. https://doi.org/10.1080/09588221.2018.1564333

Cabi, E. (2018). The impact of the flipped classroom model on students' academic achievement. *International Review of Research in Open and Distributed Learning, 19*(3).

Cassany, D. (2003). Aproximaciones a la lectura crítica: teoría, ejemplos y reflexiones. *Tarbiya: revista de investigación e innovación educativa del Instituto Universitario de Ciencias de la Educación. 2003;(32): 113–32.*

Cassany, D. (2012). *En_línea. Leer y escribir en la red*. Anagrama.

Cassany, D. (2021). *Tras las líneas: sobre la lectura contemporánea* (Vol. 341). Anagrama.

Castéra, J., Marre, C. C., Yok, M. C. K., Sherab, K., Impedovo, M. A., Sarapuu, T., Pedregosa, A. D., Malik, S. K., & Armand, H. (2020). Self-reported TPACK of teacher educators across six countries in Asia and Europe. *Education and Information Technologies, 25*(4), 3003-3019. https://doi.org/10.1007/s10639-020-10106-6

Castles, A., Rastle, K., & Nation, K. (2018). Ending the Reading Wars: Reading Acquisition From Novice to Expert. *Psychological Science in the Public Interest, 19*(1), 5-51. https://doi.org/10.1177/1529100618772271

Chee, Y. S., Mehrotra, S., & Ong, J. C. (2015). Professional development for scaling pedagogical innovation in the context of game-based learning: Teacher identity as cornerstone in "shifting" practice. *Asia-Pacific Journal of Teacher Education, 43*(5), 423-437.

Chetty, K., Qigui, L., Gcora, N., Josie, J., Wenwei, L., & Fang, C. (2018). Bridging the digital divide: measuring digital literacy. *Economics, 12*(1).

Chigona, A., & Tunjera, N. (2020). Teacher Educators' Appropriation of TPACK-SAMR Models for 21st Century Pre-Service Teacher Preparation. *International journal of information and communication technology education, 16*(3), 126-140. https://doi.org/10.4018/IJICTE.2020070110

Chiu, P. H. P., & Cheng, S. H. (2017). Effects of active learning classrooms on student learning: a two-year empirical investigation on student perceptions and academic performance. *Higher Education Research & Development, 36*(2), 269-279.

Chomsky, N. (1986). *Knowledge of language: Its nature, origin, and use*. Greenwood Publishing Group.

Chomsky, N. (2006). *Language and mind*. Cambridge University Press.

Choudhury, S., & Pattnaik, S. (2020). Emerging themes in e-learning: A review from the stakeholders' perspective. *Computers & Education, 144*, 103657.

Chowdhury, M. F. (2015). Coding, sorting and sifting of qualitative data analysis: Debates and discussion. *Quality & Quantity, 49*(3), 1135-1143.

Clarke, V., & Braun, V. (2017). Thematic analysis. *The Journal of Positive Psychology, 12*(3), 297-298. https://doi.org/10.1080/17439760.2016.1262613

Cochran-Smith, M., & Villegas, A. M. (2015). Framing teacher preparation research: An overview of the field, part 1. *Journal of Teacher Education, 66*(1), 7-20.

Collins, A., & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America*. Teachers College Press.

Colombia Aprende. (2018) https://www.colombiaaprende.edu.co/

Cordero, K., Nussbaum, M., Ibaseta, V., Otaíza, M. J., & Chiuminatto, P. (2018). Read, write, touch: Co-construction and multiliteracies in a third-grade digital writing exercise. *Journal of Computer Assisted Learning, 34*(2), 162-173.

Council, N. R. (2000). *How People Learn: Brain, Mind, Experience, and School: Expanded Edition*. The National Academies Press. https://doi.org/doi:10.17226/9853

Creswell, J. W. (2014). *Educational Research: Pearson New International Edition : Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (Vol. Fourth edition, Pearson new international edition) [Book]. Pearson. https://gateway.library.qut.edu.au/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1418055&site=ehost-live&scope=site

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Daniels, H. (2016). *Vygotsky and pedagogy*. Routledge.

Davis, K., & Fullerton, S. (2016). Connected learning in and after school: Exploring technology's role in the learning experiences of diverse high school students. *The Information Society, 32*(2), 98-116.

de Barón, G. S. A. (2016). La lectura crítica en Educación Básica Secundaria y Media: la voz de los docentes. *Cuadernos de Lingüística Hispánica*(28), 207-232.

de Colombia, G. (2017). Plan Nacional Decenal de Educación 2016–2026. *Recuperado de: http://www. plandecenal. edu. co/cms/media/herramientas/PNDE% 20FINAL_ISBN% 20web. pdf*.

de Haro Rodríguez, R., Arnaiz-Sánchez, P., & de Perdomo, C. R. N. (2020). Teacher Competences in Early Childhood Education and Inclusive Education: Design and Validation of a Questionnaire [Article]. *Competencias docentes en Educación Infantil e inclusión educativa: diseño y validación de un cuestionario., 23*(1), 1-20. https://doi.org/10.6018/reifop.407111

Delgado, A., Wardlow, L., McKnight, K., & O'Malley, K. (2015, 01/01). Educational Technology: A Review of the Integration, Resources, and Effectiveness of Technology in K-12 Classrooms. *Journal of Information Technology Education: Research, 14*, 397-416. https://doi.org/10.28945/2298

Delgado, A. J., Wardlow, L., McKnight, K., & O'Malley, K. (2015). Educational technology: A review of the integration, resources, and effectiveness of technology in K-12 classrooms. *Journal of Information Technology Education, 14*.

Demirci, C., & Yavaslar, E. (2018). Active Learning: Let's Make Them a Song. *Cypriot Journal of Educational Sciences, 13*(3), 288-298.

Denzin, N. K., & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research* (4th ed. ed.). Sage.

Devolder, A., Vanderlinde, R., van Braak, J., & Tondeur, J. (2010). Identifying multiple roles of ICT coordinators. *Computers & Education, 55*(4), 1651-1655.

Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems, 49*(1), 5-22. https://doi.org/10.1177/0047239520934018

Doherty, S. (2016). Translations| The Impact of Translation Technologies on the Process and Product of Translation. *International Journal of Communication, 10*, 23.

Dotong, C. I., De Castro, E. L., Dolot, J. A., & Prenda, M. (2016). Barriers for educational technology integration in contemporary classroom environment. *Asia Pacific Journal of Education, Arts and Sciences, 3*(2), 13-20.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education, 59*(2), 423-435.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics, 5*(1), 1-4.

Eun, B. (2019). The zone of proximal development as an overarching concept: A framework for synthesizing Vygotsky's theories. *Educational Philosophy and Theory, 51*(1), 18-30. https://doi.org/10.1080/00131857.2017.1421941

Evrim, B., & Erdem, U. (2016). Putting technological, pedagogical, and content knowledge (TPACK) in action: An integrated TPACK-design-based learning (DBL) approach. *Australasian Journal of Educational Technology, 32*(2). https://doi.org/10.14742/ajet.2551

Farquhar, J., & Michels, N. (2016). Triangulation without tears. In *Marketing challenges in a turbulent business environment* (pp. 325-330). Springer.

Fernández Sanjurjo, J., Arias Blanco, J. M., & Fernández-Costales, A. (2018). Assessing the influence of socio-economic status on students' performance in Content and Language Integrated Learning. *System, 73*, 16-26. https://doi.org/https://doi.org/10.1016/j.system.2017.09.001

Filho, W., Pallant, E., Enete, A., Richter, B., & Brandli, L. (2018). Planning and implementing sustainability in higher education institutions: an overview of the difficulties and potentials. *International Journal of Sustainable Development & World Ecology, 25*, 1-9. https://doi.org/10.1080/13504509.2018.1461707

Flick, U. (2014). *An introduction to qualitative research*. Sage.

Fola-Adebayo, T. J. (2019). Perceptions of undergraduates on the relationship between exposure to blended learning and online critical literacy skills. *Reading & Writing, 10*(1). https://doi.org/https://doi.org/10.4102/rw.v10i1.200

Friesen, N. (2012). Report: Defining blended learning.

Gamboa, L., & Londoño, E. (2014). Equality of Educational Oppotunities in Colombia: A Metropolitan Area Comparison. *Serie Documentos de Trabajo, 152*, 152.

García-García, M. Á., Arévalo-Duarte, M. A., & Hernández-Suárez, C. A. (2018). La comprensión lectora y el rendimiento escolar. *Cuadernos de Lingüística Hispánica*(32), 155-174. https://www.redalyc.org/articulo.oa?id=322258748008

Garcia, M. B. (2023). Factors Affecting Adoption Intention of Productivity Software Applications Among Teachers: A Structural Equation Modeling Investigation. *International journal of human-computer interaction, ahead-of-print*(ahead-of-print), 1-14. https://doi.org/10.1080/10447318.2022.2163565

Gardner-McTaggart, A. (2016). International elite, or global citizens? Equity, distinction and power: The International Baccalaureate and the rise of the South. *Globalisation, Societies and Education, 14*(1), 1-29.

Gee, J. P. (2005). Learning by Design: Good Video Games as Learning Machines. *E-learning and Digital Media, 2*(1), 5-16. https://doi.org/10.2304/elea.2005.2.1.5

Gee, J. P. (2007). *What video games have to teach us about learning and literacy* (Rev. and updated ed. ed.). Palgrave Macmillan.

Gee, J. P. (2009). *New digital media and learning as an emerging area and" worked examples" as one way forward*. The MIT Press.

Gentles, S. J., Charles, C., Ploeg, J., & McKibbon, K. A. (2015). Sampling in qualitative research: Insights from an overview of the methods literature. *The qualitative report, 20*(11), 1772-1789.

Goldman, S. R., Snow, C., & Vaughn, S. (2016). Common Themes in Teaching Reading for Understanding: Lessons From Three Projects. *Journal of adolescent & adult literacy, 60*(3), 255-264. https://doi.org/10.1002/jaal.586

Gómez Trigueros, I. M. (2015). EL MODELO TPACK EN LOS ESTUDIOS DE GRADO PARA LA FORMACIÓN INICIAL DEL PROFESORADO EN TIC. *Didáctica geográfica, 16*(16), 185-201.

Gómez Trigueros, I. M. (2016). La inclusión de las tecnologías en la formación inicial del profesorado: una intervención de aula a través modelo TPACK.

González-González, C., & Blanco-Izquierdo, F. (2012). Designing social videogames for educational uses. *Computers & Education, 58*(1), 250-262.

Graham, C. R., Woodfield, W., & Harrison, J. B. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *The Internet and Higher Education, 18*, 4-14. https://doi.org/https://doi.org/10.1016/j.iheduc.2012.09.003

Grant, M. M., & Barbour, M. K. (2013). Mobile teaching and learning in the classroom and online: Case studies in K-12.

Gromik, N. A. (2012). Cell phone video recording feature as a language learning tool: A case study. *Computers & Education, 58*(1), 223-230. https://doi.org/https://doi.org/10.1016/j.compedu.2011.06.013

Guerriero, S. E. (2017). Pedagogical Knowledge and the Changing Nature of the Teaching Profession. Educational Research and Innovation. *Pedagogical Knowledge and the Changing Nature of the Teaching Profession*. https://doi.org/10.1787/9789264270695-en

Gupta, S., & Bostrom, R. (2013). An Investigation of the Appropriation of Technology-Mediated Training Methods Incorporating Enactive and Collaborative Learning. *Information Systems Research*, 454-469.

Guthrie, J. T., & Klauda, S. L. (2014). Effects of classroom practices on reading comprehension, engagement, and motivations for adolescents. *Reading research quarterly*, *49*(4), 387-416.

Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*, *54*, 170-179.

Hammond, M. (2014). Introducing ICT in schools in E ngland: Rationale and consequences. *British Journal of Educational Technology*, *45*(2), 191-201.

Harris, J., Grandgenett, N., & Hofer, M. (2010). Testing a TPACK-based technology integration assessment rubric. Society for Information Technology & Teacher Education International Conference,

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. *Journal of Research on Technology in Education*, *41*(4), 393-416.

Hartman, R. J., Townsend, M. B., & Jackson, M. (2019). Educators' perceptions of technology integration into the classroom: a descriptive case study. *Journal of Research in Innovative Teaching & Learning*.

Hauser, M. D., Chomsky, N., & Fitch, W. T. (2002). The faculty of language: what is it, who has it, and how did it evolve? *science*, *298*(5598), 1569-1579.

Hausfather, S. J. (1996). Vygotsky and Schooling: Creating a Social Context for Learning. *Action in Teacher Education*, *18*(2), 1-10. https://doi.org/10.1080/01626620.1996.10462828

Haydn, T. (2014). How do you get pre-service teachers to become 'good at ICT'in their subject teaching? The views of expert practitioners. *Technology, Pedagogy and Education*, *23*(4), 455-469.

Hébert, C., & Jenson, J. (2019). Digital game-based pedagogies: Developing teaching strategies for game-based learning. *Journal of Interactive Technology and Pedagogy, 15*.

Henderson, M. B. (2021). Amid pandemic, support soars for online learning, parent poll shows. *Education Next, 21*(1).

Henriksen, D., Mehta, R., & Rosenberg, J. (2019). Supporting a creatively focused technology fluent mindset among educators: Survey results from a five-year inquiry into teachers' confidence in using technology. *Journal of Technology and Teacher Education, 27*(1), 63-95.

Herring, M. C., Mishra, P., & Koehler, M. J. (2016). *Handbook of technological pedagogical content knowledge (TPACK) for educators* (2nd ed. ed.). Routledge.

Hicks, A., & Graber, A. (2010). Shifting paradigms: teaching, learning and Web 2.0. *Reference services review, 38*(4), 621-633. https://doi.org/10.1108/00907321011090764

Hilal, A. H., & Alabri, S. S. (2013). Using NVivo for data analysis in qualitative research. *International interdisciplinary journal of education, 2*(2), 181-186.

Hilton, J. T. (2016). A Case Study of the Application of SAMR and TPACK for Reflection on Technology Integration into Two Social Studies Classrooms. *Social studies (Philadelphia, Pa : 1934), 107*(2), 68-73. https://doi.org/10.1080/00377996.2015.1124376

Hofer, M., & Grandgenett, N. (2012). TPACK development in teacher education: A longitudinal study of preservice teachers in a secondary MA Ed. program. *Journal of Research on Technology in Education, 45*(1), 83-106.

Hohlfeld, T. N., Ritzhaupt, A. D., Barron, A. E., & Kemker, K. (2008). Examining the digital divide in K-12 public schools: Four-year trends for supporting ICT literacy in Florida. *Computers & Education, 51*(4), 1648-1663.

Hopper, T., Fu, H., Sanford, K., & Hinkel, T. A. (2021). YouTube for Transcribing and Google Drive for Collaborative Coding: Cost-Effective Tools for Collecting and Analyzing Interview Data. *The Qualitative Report, 26*(3), 861-873. https://doi.org/http://dx.doi.org/10.46743/2160-3715/2021.4639

Huizenga, J. C., ten Dam, G. T. M., Voogt, J. M., & Admiraal, W. F. (2017). Teacher perceptions of the value of game-based learning in secondary education. *Computers & Education, 110*, 105-115. https://doi.org/https://doi.org/10.1016/j.compedu.2017.03.008

Hung, H.-T. (2015). Flipping the classroom for English language learners to foster active learning. *Computer Assisted Language Learning, 28*(1), 81-96. https://doi.org/10.1080/09588221.2014.967701

Hwang, W.-Y., Nguyen, T.-H., & Pham, X.-L. (2019). Peer Tutoring to Facilitate Cognitive Diffusion of English as a Foreign Language Learning: Using Speech Translation and Shadowing in Familiar Authentic Contexts. *Journal of Educational Computing Research, 57*(4), 901-929. https://doi.org/10.1177/0735633118776209

Jacy, I., Jennifer, L. S., & Jennifer, F. S. (2008). Introduction: Why Adolescent Literacy Matters Now. *Harvard educational review, 78*(1), 1.

James, B., & Poonam, K. (2015). Students' Perceptions of Teaching and Social Presence: A Comparative Analysis of Face-to-Face and Online Learning Environments. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT), 10*(1), 27-44. https://doi.org/10.4018/ijwltt.2015010103

Jang, B. G., & Ryoo, J. H. (2019). Multiple dimensions of adolescents' reading attitudes and their relationship with reading comprehension. *Reading and Writing, 32*(7), 1769-1793.

Jang, S.-J., & Tsai, M.-F. (2013). Exploring the TPACK of Taiwanese secondary school science teachers using a new contextualized TPACK model. *Australasian Journal of Educational Technology, 29*(4), 566-580. https://doi.org/10.14742/ajet.282

Jenner, B., Flick, U., von Kardoff, E., & Steinke, I. (2004). *A companion to qualitative research*. Sage.

Jeong, H., & Hmelo-Silver, C. E. (2016). Seven Affordances of Computer-Supported Collaborative Learning: How to Support Collaborative Learning? How Can Technologies Help? *Educational Psychologist, 51*(2), 247-265. https://doi.org/10.1080/00461520.2016.1158654

Jiménez Porta, A. M., & Diez-Martínez Day, E. (2018). Análisis del contenido de apps y videojuegos: implicaciones en procesos cognitivos en la lectura inicial. *Apertura, 10*(1), 71-87. https://www.redalyc.org/articulo.oa?id=68855405005 (IN FILE)

Jimoyiannis, A. (2010). Designing and implementing an integrated technological pedagogical science knowledge framework for science teachers professional development. *Computers & Education, 55*(3), 1259-1269.

Johansson, S., & Myrberg, E. (2019). Teacher specialization and student perceived instructional quality: what are the relationships to student reading achievement? *Educational Assessment, Evaluation and Accountability, 31*(2), 177-200.

Jong, B., & Tan, K. H. (2021). Using Padlet as a Technological Tool for Assessment of Students' Writing Skills in Online Classroom Settings. *International Journal of Education and Practice, 9*(2), 411-423.

Karami, J., Abbasi, Z., & Zakei, A. (2013). The effect of phonological awareness training on speed, accuracy and comprehension of students with dyslexia.

Keane, T., Keane, W. F., & Blicblau, A. S. (2016). Beyond traditional literacy: Learning and transformative practices using ICT. *Education and Information Technologies, 21*(4), 769-781. https://doi.org/10.1007/s10639-014-9353-5

Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems, 46*(1), 4-29.

Khan, M. S. H., Hasan, M., & Clement, C. K. (2012). Barriers to the introduction of ICT into education in developing countries: The example of Bangladesh. *International Journal of instruction, 5*(2).

Kim, B., Park, H., & Baek, Y. (2009). Not just fun, but serious strategies: Using meta-cognitive strategies in game-based learning. *Computers & Education, 52*(4), 800-810.

Kirkland, B. A. (2014). Models for Technology Integration in the Learning Commons. *School libraries in Canada, 32*(1).

Koch, L. C., Niesz, T., & McCarthy, H. (2014). Understanding and Reporting Qualitative Research:An Analytical Review and Recommendations for Submitting Authors. *Rehabilitation Counseling Bulletin, 57*(3), 131-143. https://doi.org/10.1177/0034355213502549

Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education, 9*(1), 60-70.

Koehler, M. J., Mishra, P., Bouck, E. C., DeSchryver, M., Kereluik, K., Shin, T. S., & Wolf, L. G. (2011). Deep-play: Developing TPACK for 21st century teachers. *International Journal of Learning Technology, 6*(2), 146-163.

Koehler, M. J., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge (TPACK)? *Journal of education, 193*(3), 13-19.

Koh, J. H. L., Chai, C. S., & Lim, W. Y. (2017). Teacher Professional Development for TPACK-21CL:Effects on Teacher ICT Integration and Student Outcomes. *Journal of Educational Computing Research, 55*(2), 172-196. https://doi.org/10.1177/0735633116656848

Kramarski, B., & Michalsky, T. (2010). Preparing preservice teachers for self-regulated learning in the context of technological pedagogical content knowledge. *Learning and Instruction, 20*(5), 434-447.

Kvale, S. (2011). *Las entrevistas en investigación cualitativa*. Ediciones Morata.

Kvale, S., & Brinkmann, S. (2018). Doing interviews. *Doing interviews*, 1-208.

Lai, M. K., Wilson, A., McNaughton, S., & Hsiao, S. (2014). Improving Achievement in Secondary Schools: Impact of a Literacy Project on Reading Comprehension and Secondary School Qualifications. *Reading research quarterly, 49*(3), 305-334. https://doi.org/10.1002/rrq.73

Lavidas, K., Komis, V., & Achriani, A. (2022). Explaining faculty members' behavioral intention to use learning management systems. *Journal of Computers in Education, 9*(4), 707-725.

Lee, C. D., & Spratley, A. (2010). Reading in the Disciplines: The Challenges of Adolescent Literacy. Final Report from Carnegie Corporation of New York's Council on Advancing Adolescent Literacy. *Carnegie Corporation of New York*.

Li, L., Worch, E., Zhou, Y., & Aguiton, R. (2015). How and why digital generation teachers use technology in the classroom: An explanatory sequential mixed methods study. *International Journal for the Scholarship of Teaching and Learning, 9*(2), n2.

Liao, H., McDermott, E., & Senior, A. (2013). Large scale deep neural network acoustic modeling with semi-supervised training data for YouTube video transcription. 2013 IEEE Workshop on Automatic Speech Recognition and Understanding,

Lichtman, M. (2010). *Qualitative research in education : a user's guide* (2nd ed. ed.). Sage Publications.

Licorish, S. A., Owen, H. E., Daniel, B., & George, J. L. (2018). Students' perception of Kahoot!'s influence on teaching and learning. *Research and*

Practice in Technology Enhanced Learning, 13(1), 9. https://doi.org/10.1186/s41039-018-0078-8

Lin, F. Y. (2017). A refutation of universal grammar. *Lingua, 193*, 1-22. https://doi.org/https://doi.org/10.1016/j.lingua.2017.04.003

Lin, T.-C., Tsai, C.-C., Chai, C. S., & Lee, M.-H. (2013). Identifying Science Teachers' Perceptions of Technological Pedagogical and Content Knowledge (TPACK). *Journal of science education and technology, 22*(3), 325-336. https://doi.org/10.1007/s10956-012-9396-6

Loening, J., Rao, B., & Singh, R. (2010). Effects of schooling levels on economic growth: time-series evidence from Guatemala. *IDEAS Working Paper Series from RePEc*.

Logan, H., Sumsion, J., & Press, F. (2015). The Council of Australian Government Reforms [2007–2013]: a critical juncture in Australian early childhood education and care (ECEC) policy? *International Journal of Child Care and Education Policy, 9*(1), 1-16.

Lopez-Sintas, J., Lamberti, G., & Sukphan, J. (2020). The social structuring of the digital gap in a developing country. The impact of computer and internet access opportunities on internet use in Thailand. *Technology in Society, 63*, 101433. https://doi.org/https://doi.org/10.1016/j.techsoc.2020.101433

Lopezosa, C. (2020). Entrevistas semiestructuradas con NVivo: pasos para un análisis cualitativo eficaz. *Lopezosa C, Díaz-Noci J, Codina L, editores Methodos Anuario de Métodos de Investigación en Comunicación Social, 1. Barcelona: Universitat Pompeu Fabra; 2020. p. 88-97.*

Luke, A., & Dooley, K. T. (2011). Critical literacy and second language learning. *Handbook of research on second language teaching and learning*.

Luke, A., & Woods, A. F. (2009). Critical literacies in schools: A primer. *Voices from the Middle, 17*(2), 9-18.

Maderick, J. A., Zhang, S., Hartley, K., & Marchand, G. (2016). Preservice Teachers and Self-Assessing Digital Competence. *Journal of Educational Computing Research, 54*(3), 326-351. https://doi.org/10.1177/0735633115620432

Majumdar, S. (2015). Emerging trends in ICT for education & training. *Gen. Asia Pacific Reg. IVETA*.

Mallinson, D. J. (2022). Nearpod: Classroom Learning Platform, (https://nearpod.com). *Journal of Political Science Education, 18*(3), 411-416. https://doi.org/10.1080/15512169.2022.2080072

Mancilla, R. L. (2014). BYOD: Re-examining the issue of digital equity. *Teachers College Record*.

Marchand-Martella, N. E., Martella, R. C., Modderman, S. L., Petersen, H. M., & Pan, S. (2013). Key areas of effective adolescent literacy programs. *Education & Treatment of Children, 36*(1), 161+. https://link.gale.com/apps/doc/A318754150/AONE?u=qut&sid=bookmark-AONE&xid=ba038b11

Márquez Hermosillo, M. M., & Valenzuela González, J. R. (2018). Leer más allá de las líneas. Análisis de los procesos de lectura digital desde la perspectiva de la literacidad. *Sinéctica*, 0-0. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-109X2018000100012&nrm=iso

Martínez-Díaz, E. S., Díaz, N., & Rodríguez, D. E. (2011a). El andamiaje asistido en procesos de comprensión lectora en universitarios. *Educación y educadores, 14*(3), 531-555.

Martínez-Díaz, E. S., Díaz, N., & Rodríguez, D. E. (2011b). El andamiaje asistido en procesos de comprensión lectora en universitarios. *Educación y educadores, 14*(3), 531-556.

Mattar, J. (2018). Constructivism and connectivism in education technology: Active, situated, authentic, experiential, and anchored learning [El constructivismo y el conectivismo en tecnología educativa: El aprendizaje activo, situado, auténtico, experiencial y anclado]. *Revista Iberoamericana de Educación a Distancia, 21*(2), 201-217. https://doi.org/http://dx.doi.org/10.5944/ried.21.2.20055

McMullan, T., & Sutherland, J. (2020). Developing motivated adolescent readers and enhancing student voice, using action research in disadvantaged contexts. *London Review of Education*.

Medlock Paul, C. (2016). Integrating critical literacy in the middle school classroom. *Middle Grades Review, 2*(2), 5.

Mei, B., Brown, G. T. L., & Teo, T. (2017). Toward an Understanding of Preservice English as a Foreign Language Teachers' Acceptance of Computer-Assisted Language Learning 2.0 in the People's Republic of China. *Journal of Educational Computing Research, 56*(1), 74-104. https://doi.org/10.1177/0735633117700144

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative Research : A Guide to Design and Implementation*. John Wiley & Sons, Incorporated. http://ebookcentral.proquest.com/lib/qut/detail.action?docID=2089475

Miles, M. B. (2014). *Qualitative data analysis : a methods sourcebook* (Third edition. ed.). SAGE Publications, Inc.

Mills, A. J. (2010). *Encyclopedia of case study research*. SAGE Publications.

Ministerio de Tecnología de Información y Comunicación. (2008). *Plan Nacional de TIC 2008-2019*. Retrieved 12-11-2023 from https://eduteka.icesi.edu.co/pdfdir/ColombiaPlanNacionalTIC.pdf

MinTIC (2014), "Vive digital para la gente", webpage, https://mintic.gov.co/images/MS_VIVE_DIGITAL/archivos/Vivo_Vive_Digital.pdf (accessed on 26 Nov 2023).

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge [Article]. *Teachers college record, 108*(6), 1017-1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Mishra, P., Koehler, M. J., & Henriksen, D. (2011). The seven trans-disciplinary habits of mind: Extending the TPACK framework towards 21st century learning. *Educational Technology*, 22-28.

Mohamad Nor, N., & Rashid, R. A. (2018). A review of theoretical perspectives on language learning and acquisition. *Kasetsart Journal of Social Sciences, 39*(1), 161-167. https://doi.org/https://doi.org/10.1016/j.kjss.2017.12.012

Molas, N., & Roselló, M. (2010). Revolución en las aulas: llegan los profesores del siglo XXI. *Revista DIM, 19*.

Montessori, M. (1988). *The absorbent mind*. Clio.

Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education, 14*(2), 129-135.

Mouza, C., & Karchmer-Klein, R. (2013). Promoting and assessing pre-service teachers' technological pedagogical content knowledge (TPACK) in the context of case development. *Journal of Educational Computing Research, 48*(2), 127-152.

Muñoz, F. J. R., & Ruiz-Domínguez, M. d. M. (2022). La competencia digital del profesorado de literatura en Educación Secundaria en España. *Texto Livre, 14*.

Muter, V., Hulme, C., Snowling, M. J., & Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: evidence from a longitudinal study. *Developmental psychology, 40*(5), 665.

Myrberg, E., Johansson, S., & Rosén, M. (2019). The relation between teacher specialization and student reading achievement. *Scandinavian Journal of Educational Research, 63*(5), 744-758.

Nadeem, N. H. (2019). Students' Perceptions About the Impact of Using Padlet on Class Engagement: An Exploratory Case Study. *International journal of computer-assisted language learning and teaching*, *9*(4), 72-89. https://doi.org/10.4018/IJCALLT.2019100105

Neuman, D. (2014). Qualitative research in educational communications and technology: A brief introduction to principles and procedures. *Journal of Computing in Higher Education, 26*, 69-86.

Nicholas, K., & Fletcher, J. (2017). What is happening in the use of ICT mathematics to support young adolescent learners? A New Zealand experience. *Educational Review, 69*(4), 474-489. https://doi.org/10.1080/00131911.2016.1237476

Niess, M. L. (2011). Investigating TPACK: Knowledge growth in teaching with technology. *Journal of Educational Computing Research, 44*(3), 299-317.

Nye, B. D. (2015). Intelligent Tutoring Systems by and for the Developing World: A Review of Trends and Approaches for Educational Technology in a Global Context. *International Journal of Artificial Intelligence in Education, 25*(2), 177-203. https://doi.org/10.1007/s40593-014-0028-6

Nykvist, S., Mukherjee, M., & Blundell, C. N. (2022). Innovative Approaches Used to Prepare Pre-service Teachers to Activate Learning with Digital Technologies. In T. Bourke, D. Henderson, R. Spooner-Lane, & S. White (Eds.), *Reconstructing the Work of Teacher Educators: Finding Spaces in Policy Through Agentic Approaches —Insights from a Research Collective* (pp. 245-262). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-2904-5_12

Octavio, N. C., & Párraga, M. A. A. (2017). Análisis comparativo de las políticas públicas en tecnología educativa/Comparative analysis of public policies in educational technology. *Vivat Academia*, 1-15.

OECD. (2015). *OECD Digital Economy Outlook 2015*. https://doi.org/doi:https://doi.org/10.1787/9789264232440-en

OECD. (2019a). *Country Note: Colombia Programme for International Student Assessment Results*. https://www.oecd.org/pisa/publications/PISA2018_CN_COL.pdf

OECD. (2019b). *OECD Reviews of Digital Transformation: Going Digital in Colombia*. https://www.oecd-ilibrary.org/sites/5b895408-en/index.html?itemId=/content/component/5b895408-en

OECD, D. (2001). Understanding the digital divide. *Paris: Organization for Economic Cooperation and Development*.

Oke, A., & Fernandes, F. A. P. (2020). Innovations in Teaching and Learning: Exploring the Perceptions of the Education Sector on the 4th Industrial Revolution (4IR). *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(2), 31. https://doi.org/https://doi.org/10.3390/joitmc6020031

Olofson, M. W., Swallow, M. J. C., & Neumann, M. D. (2016). TPACKing: A constructivist framing of TPACK to analyze teachers' construction of knowledge. *Computers & Education*, *95*, 188-201. https://doi.org/https://doi.org/10.1016/j.compedu.2015.12.010

Oslund, E. L., Clemens, N. H., Simmons, D. C., & Simmons, L. E. (2018). The direct and indirect effects of word reading and vocabulary on adolescents' reading comprehension: Comparing struggling and adequate comprehenders. *Reading and Writing*, *31*(2), 355-379.

Pacheco, V. M. S., & López, J. F. B. (2018). Análisis de la percepción de docentes, usuarios de una plataforma educative a través de los modelos TPACK, SAMR y TAM3 en una institución de educación superior. (Spanish) [Article]. *Apertura: Revista de Innovación Educativa*, *10*(1), 116-131. https://doi.org/10.18381/Ap.v10n1.1162

Padilla-Escorcia, I. A., González-Tinoco, N. E., & Fernández-Díaz, O. R. (2022). Statistical Model to Estimate the Influence of Critical Reading on the Competencies Assessed in the Saber 11°. *Trilogía Ciencia Tecnología Sociedad*, *14*(26).

Patton, M. Q. (2015). *Qualitative research & evaluation methods : integrating theory and practice* (Fourth edition. ed.). SAGE Publications, Inc.

Piaget, J. (1969). *The psychology of the child*. Routledge & Kegan Paul.

Pinker, S. (1995). Language acquisition. *Language: An invitation to cognitive science, 1*, 135-182.

Pinker, S. (2003). *The language instinct: How the mind creates language*. Penguin UK.

Polly, D., Mims, C., Shepherd, C. E., & Inan, F. (2010). Evidence of impact: Transforming teacher education with preparing tomorrow's teachers to teach with technology (PT3) grants. *Teaching and teacher education, 26*(4), 863-870.

Prado, J. E. Q., Palaquibay, J. E. G., Arrieta, S. d. R. G., & Espinoza, G. R. R. (2022). Estrategias de enseñanza aprendizaje para mejorar la lectura crítica. *Polo del Conocimiento, 7*(10), 64-81.

Prensky, M. (2001). Fun, play and games: What makes games engaging. *Digital game-based learning, 5*(1), 5-31.

Prensky, M. (2003). Digital game-based learning. *Computers in Entertainment (CIE), 1*(1), 21-21.

Prestridge, S. (2017). Examining the shaping of teachers' pedagogical orientation for the use of technology. *Technology, Pedagogy and Education, 26*(4), 367-381.

Price, G. P., Wright, V. H., & Rice, M. L. (2014). Determining the impact of an integrated triadic model on TPACK development in preservice teachers. *Journal of Digital Learning in Teacher Education, 30*(4), 139-149.

Proske, A., Roscoe, R., & McNamara, D. (2014). Game-based practice versus traditional practice in computer-based writing strategy training: effects on motivation and achievement. *Educational Technology Research and Development, 62*(5), 481-505. https://doi.org/10.1007/s11423-014-9349-2

Puentedura, R. R. (2010). SAMR and TPCK: Intro to advanced practice. Hippasus. http://hippasus.com/resources/sweden2010/SAMR_TPCK_IntroToAdvancedPractice.pdf

Puentedura, R. (2006). Substitution, augmentation, modification, and redefinition (SAMR) model.

Qian, M., & Clark, K. R. (2016). Game-based Learning and 21st century skills: A review of recent research. *Computers in Human Behavior, 63*, 50-58.

Quitián-Bernal, S. P., & González-Martínez, J. (2022). Estrategias colaborativas para el diseño de ambientes blended learning en lectura. *Enunciación, 27*(2), 266-288.

Resta, P., & Laferrière, T. (2015). Digital equity and intercultural education. *Education and Information Technologies, 20*(4), 743-756.

Reyes, V. C., Reading, C., Doyle, H., & Gregory, S. (2017). Integrating ICT into teacher education programs from a TPACK perspective: Exploring perceptions of university lecturers. *Computers & Education, 115*, 1-19. https://doi.org/https://doi.org/10.1016/j.compedu.2017.07.009

Rich, P. J., Jones, B., Belikov, O., Yoshikawa, E., & Perkins, M. (2017). Computing and Engineering in Elementary School: The Effect of Year-Long Training on Elementary Teacher Self-Efficacy and Beliefs about Teaching Computing and Engineering. *1*(1). https://doi.org/10.21585/ijcses.v1i1.6

Ritchie, J., Spencer, L., Bryman, A., & Burgess, R. (1994). Qualitative data analysis for applied policy research. *Analyzing qualitative data, 173*, 194.

Ritzhaupt, A. D., Cheng, L., Luo, W., & Hohlfeld, T. N. (2020). The Digital Divide in Formal Educational Settings: The Past, Present, and Future Relevance. In *Handbook of Research in Educational Communications and Technology* (pp. 483-504). Springer.

Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family & Consumer Sciences, 105*(2), 44-49.

Romero, M., Laferriere, T., & Power, T. M. (2016). The move is on! From the passive multimedia learner to the engaged co-creator. *ELearn*, *2016*(3).

Roscoe, R. D., Allen, L. K., Weston, J. L., Crossley, S. A., & McNamara, D. S. (2014). The Writing Pal Intelligent Tutoring System: Usability Testing and Development. *Computers and Composition, 34*, 39-59. https://doi.org/https://doi.org/10.1016/j.compcom.2014.09.002

Rosenberg, J. M., & Koehler, M. J. (2015). Context and Technological Pedagogical Content Knowledge (TPACK): A Systematic Review. *Journal of Research on Technology in Education, 47*(3), 186-210. https://doi.org/10.1080/15391523.2015.1052663

Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. *American educator, 36*(1), 12.

Rotgans, J. I., & Schmidt, H. G. (2011). Situational interest and academic achievement in the active-learning classroom. *Learning and Instruction, 21*(1), 58-67.

Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data*. sage.

Rupley, W. H., Blair, T. R., & Nichols, W. D. (2009). Effective Reading Instruction for Struggling Readers: The Role of Direct/Explicit Teaching. *Reading & Writing Quarterly*, *25*(2-3), 125-138. https://doi.org/10.1080/10573560802683523

Sabanci, A., Ozyildirim, G., & Imsir, R. (2014). The effect of ICT usage on the classroom management: A case study in language teaching. *International Review of Social Sciences and Humanities*, *7*(1), 232-245.

Salmons, J. (2014). *Qualitative online interviews: Strategies, design, and skills*. Sage Publications.

Saltan, F., & Arslan, K. (2017). A comparison of in-service and pre-service teachers' technological pedagogical content knowledge self-confidence. *Cogent Education*, *4*(1), 1311501. https://doi.org/10.1080/2331186X.2017.1311501

Sánchez Sáenz, C. L. (2012). TECNOLOGÍAS DE LA INFORMACIÓN Y LA COMUNICACIÓN EN LA FORMACIÓN. POLÍTICAS ACTUALES. *Revista Educación y Desarrollo Social*, *6*(2).

Saudelli, M. G., & Ciampa, K. (2016, 2016/03/14). Exploring the role of TPACK and teacher self-efficacy: an ethnographic case study of three iPad language arts classes. *Technology, Pedagogy and Education*, *25*(2), 227-247. https://doi.org/10.1080/1475939X.2014.979865

Schmidt, A, D., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological pedagogical content knowledge (TPACK) the development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education*, *42*(2), 123-149.

Schreier, M. (2018). Sampling and generalization. *The SAGE handbook of qualitative data collection*, 84-97.

Schunk, D. (2020). Teorías del aprendizaje / Dale H. Schunk. *SERBIULA (sistema Librum 2.0)*.

Secretaría de Educación del Distrito de Bogotá. (2018a). *Caracterización del Sector Educativo*.

Selwood, I., & Pilkington, R. (2005). Teacher workload: using ICT to release time to teach. *Educational Review*, *57*(2), 163-174.

Shaffer, D. W., Squire, K. R., Halverson, R., & Gee, J. P. (2005). Video games and the future of learning. *Phi Delta Kappan, 87*(2), 105-111.

Shanahan, L. E., & Tochelli, A. L. (2014). Examining the Use of Video Study Groups for Developing Literacy Pedagogical Content Knowledge of Critical Elements of Strategy Instruction With Elementary Teachers. *Literacy Research and Instruction, 53*(1), 1-24. https://doi.org/10.1080/19388071.2013.827764

Shute, V. J., Ventura, M., & Ke, F. (2015). The power of play: The effects of Portal 2 and Lumosity on cognitive and noncognitive skills. *Computers & Education, 80*, 58-67.

Silver, C. (2018). CAQDAS at a crossroads: Choices, controversies and challenges. Computer supported qualitative research: Second international symposium on qualitative research (ISQR 2017),

Sinkovics, R. R., & Alfoldi, E. A. (2012). Progressive Focusing and Trustworthiness in Qualitative Research. *Management International Review, 52*(6), 817-845. https://doi.org/10.1007/s11575-012-0140-5

Skinner, B. F. (1985). Cognitive science and behaviourism. *British Journal of psychology, 76*(3), 291-301.

Smallhorn, M. (2017). The flipped classroom: A learning model to increase student engagement not academic achievement [Article]. *Student Success, 8*(2), 43-53. https://doi.org/10.5204/ssj.v8i2.381

Smith Avendaño de Barón, G., & González González, O. L. (2020). Una propuesta de plan de clase para dinamizar la lectura crítica. *Folios*(52), 155-171.

So, H.-J., & Kim, B. (2009). Learning about Problem Based Learning: Student Teachers Integrating Technology, Pedagogy and Content Knowledge. *Australasian Journal of Educational Technology, 25*(1), 101-116. https://doi.org/10.14742/ajet.1183

Squire, K. (2006). From Content to Context: Videogames as Designed Experience. *Educational Researcher, 35*(8), 19-29. https://doi.org/10.3102/0013189X035008019

Stieler-Hunt, C., & Jones, C. (2015). Educators who believe: understanding the enthusiasm of teachers who use digital games in the classroom. *Research in Learning Technology, 23*(1). https://doi.org/10.3402/rlt.v23.26155

Stojanov, Ž. (2014). Techniques for collecting qualitative field data in education research: Example of two studies in information technology field. *Sinteza 2014-Impact of the Internet on Business Activities in Serbia and Worldwide*, 362-367.

Street, B. V. (2008). Nuevas alfabetizaciones, nuevos tiempos.¿ Cómo describimos y enseñamos los conocimientos, las habilidades y los valores acordes con las formas de alfabetización que las personas necesitan para los nuevos tiempos? *Revista Interamericana de Educación de Adultos, 30*(2), 41-69.

Swallow, M. J. C., & Olofson, M. W. (2017). Contextual Understandings in the TPACK Framework. *Journal of Research on Technology in Education, 49*(3-4), 228-244. https://doi.org/10.1080/15391523.2017.1347537

Swanson, E., Wanzek, J., Vaughn, S., Fall, A.-M., Roberts, G., Hall, C., & Miller, V. L. (2017). Middle school reading comprehension and content learning intervention for below-average readers. *Reading & Writing Quarterly, 33*(1), 37-53.

Tai, S.-J. D. (2013). From TPACK-in-action workshops to English classrooms: CALL competencies developed and adopted into classroom teaching.

Talley, C. P., & Scherer, S. (2013). The enhanced flipped classroom: Increasing academic performance with student-recorded lectures and practice testing in a" flipped" STEM course. *The Journal of Negro Education, 82*(3), 339-347.

Taufikurohman, I. S. (2018). THE EFFECTIVENESS OF USING PADLET IN TEACHING WRITING DESCRIPTIVE TEXT. *JALL (Journal of Applied Linguistics and Literacy), 2*(2), 71-88. https://doi.org/10.25157/jall.v2i2.2190

Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2008). *Teacher professional learning and development* (Vol. 18). International Adacemy of Education.

Tobin, K. (2015). Qualitative research in classrooms: Pushing the boundaries of theory and methodology. In *Doing educational research* (pp. 33-75). Brill Sense.

Tondeur, J., Aesaert, K., Prestridge, S., & Consuegra, E. (2018). A multilevel analysis of what matters in the training of pre-service teacher's ICT competencies. *Computers & Education, 122*, 32-42.

Tondeur, J., Pareja Roblin, N., van Braak, J., Voogt, J., & Prestridge, S. (2017). Preparing beginning teachers for technology integration in education: ready for take-off? *Technology, Pedagogy and Education, 26*(2), 157-177. https://doi.org/10.1080/1475939X.2016.1193556

Tondeur, J., Valcke, M., & Van Braak, J. (2008). A multidimensional approach to determinants of computer use in primary education: Teacher and school characteristics. *Journal of Computer Assisted Learning*, *24*(6), 494-506.

Tornwall, J., Lu, L., & Xie, K. (2020). Frequency of participation in student response system activities as a predictor of final grade: An observational study. *Nurse education today*, *87*, 104342.

Torppa, M., Poikkeus, A.-M., Laakso, M.-L., Eklund, K., & Lyytinen, H. (2006). Predicting delayed letter knowledge development and its relation to grade 1 reading achievement among children with and without familial risk for dyslexia. *Developmental psychology*, *42*(6), 1128.

Trelease, R. B. (2016). From chalkboard, slides, and paper to e-learning: How computing technologies have transformed anatomical sciences education. *Anatomical sciences education*, *9*(6), 583-602.

Tseng, J.-J., Chai, C. S., Tan, L., & Park, M. (2020). A critical review of research on technological pedagogical and content knowledge (TPACK) in language teaching. *Computer Assisted Language Learning*, 1-24.

Turkkahraman, M. (2015). Education, Teaching and School as A Social Organization. *Procedia-Social and Behavioral Sciences*, *186*, 381-387.

Twining, P., Raffaghelli, J., Albion, P., & Knezek, D. (2013). Moving education into the digital age: the contribution of teachers' professional development. *Journal of Computer Assisted Learning*, *29*(5), 426-437.

Udalla, J. (2020). The effect of drama based instruction on reading comprehension. *Innovations and Critical Issues in Teaching and Learning*, *1*(2), 2.

UNESCO. (2015). *Rethinking education: towards a global common good?* FRANCE.

United Nations. (2015). *Sustainable development goals: The 17 goals*. United Nations Department of Economic and Social Affairs. https://sdgs.un.org/goals

Urbina, A. and Polly, D. (2017), "Examining elementary school teachers' integration of technology and enactment of TPACK in mathematics", *International Journal of Information and Learning Technology*, Vol. 34 No. 5, pp. 439-451. https://doi.org/10.1108/IJILT-06-2017-0054

Van Eck, R. (2006). Digital game-based learning: It's not just the digital natives who are restless. *EDUCAUSE review*, *41*(2), 16.

Van Eck, R. (2015). Digital game-based learning: Still restless, after all these years. *EDUCAUSE review*, *50*(6), 13.

Viberg, O., Mavroudi, A., Khalil, M., & Bälter, O. (2020). Validating an Instrument to Measure Teachers' Preparedness to Use Digital Technology in their Teaching. *Nordic Journal of Digital Literacy*, *15*(1), 38-54. https://doi.org/10.18261/issn.1891-943x-2020-01-04

Vitanova, V., Atanasova-Pachemska, T., Iliev, D., & Pachemska, S. (2015). Factors Affecting the Development of ICT Competencies of Teachers in Primary Schools. *Procedia - Social and Behavioral Sciences*, *191*, 1087-1094. https://doi.org/https://doi.org/10.1016/j.sbspro.2015.04.344

Vogel, J. J., Greenwood-Ericksen, A., Cannon-Bowers, J., & Bowers, C. A. (2006). Using Virtual Reality with and without Gaming Attributes for Academic Achievement. *Journal of Research on Technology in Education*, *39*(1), 105-118. https://doi.org/10.1080/15391523.2006.10782475

Voogt, J., Erstad, O., Dede, C., & Mishra, P. (2013). Challenges to learning and schooling in the digital networked world of the 21st century. *Journal of Computer Assisted Learning*, *29*(5), 403-413. https://doi.org/10.1111/jcal.12029

Voogt, J., & McKenney, S. (2017). TPACK in teacher education: are we preparing teachers to use technology for early literacy? *Technology, Pedagogy and Education*, *26*(1), 69-83. https://doi.org/10.1080/1475939X.2016.1174730

Vygotsky, L. S. (1962). *Thought and language*. MIT Press.

Vygotsky, L. S. (1980). *Mind in society: The development of higher psychological processes*. Harvard university press.

Waltemeyer, S., Hembree, J. R., & Hammond, H. G. (2021). Padlet: The Multipurpose Web 2.0 Tool. *Journal of Instructional Research*, *10*, 93-99.

Wang, A. I. (2015). The wear out effect of a game-based student response system. *Computers and education*, *82*, 217-227. https://doi.org/10.1016/j.compedu.2014.11.004

Wang, A. I., & Tahir, R. (2020). The effect of using Kahoot! for learning – A literature review. *Computers & Education, 149*, 103818. https://doi.org/https://doi.org/10.1016/j.compedu.2020.103818

Webb, M. (2014). Pedagogy with information and communications technologies in transition. *Education and Information Technologies, 19*(2), 275-294.

Wertsch, J. V. (1991). *Voices of the mind: Sociocultural approach to mediated action*. Harvard University Press.

Willingham, D. T. (2004). Ask the cognitive scientist the privileged status of story. *American Educator, 28*, 43-45.

Wilson, K. (2020). What does it mean to do teaching? A qualitative study of resistance to Flipped Learning in a higher education context. *Teaching in Higher Education*, 1-14.

Woessmann, L. (2016). The Importance of School Systems: Evidence from International Differences in Student Achievement. *The Journal of Economic Perspectives, 30*(3), 3-32. https://doi.org/http://dx.doi.org/10.1257/jep.30.3.3

Woo, J.-C. (2014). Digital game-based learning supports student motivation, cognitive success, and performance outcomes. *Journal of Educational Technology & Society, 17*(3), 291-307.

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of child psychology and psychiatry, 17*(2), 89-100.

Woods, M., Paulus, T., Atkins, D. P., & Macklin, R. (2016). Advancing Qualitative Research Using Qualitative Data Analysis Software (QDAS)? Reviewing Potential Versus Practice in Published Studies using ATLAS.ti and NVivo, 1994–2013. *Social Science Computer Review, 34*(5), 597-617. https://doi.org/10.1177/0894439315596311

World Bank Group. (2016). *World development report 2016: Digital dividends*. World Bank Publications.

Yildiz Durak, H. (2021). Modeling of relations between K-12 teachers' TPACK levels and their technology integration self-efficacy, technology literacy levels, attitudes toward technology and usage objectives of social networks. *Interactive Learning Environments, 29*(7), 1136-1162. https://doi.org/10.1080/10494820.2019.1619591

Yin, R. K. (2014). *Case study research : design and methods* (Fifth edition. ed.). SAGE.

Yin, R. K. (2015). *Qualitative Research from Start to Finish, Second Edition*. Guilford Publications. http://ebookcentral.proquest.com/lib/qut/detail.action?docID=2008479

Yin, R. K. (2018). *Case study research and applications : design and methods* (Sixth edition. ed.). SAGE Publications, Inc.

Young, C., Durham, P., Miller, M., Rasinski, T. V., & Lane, F. (2019). Improving reading comprehension with readers theater. *The Journal of Educational Research, 112*(5), 615-626.

Yuni, P., Tuti, K., Fendy Hardian, P., Endrik, N., & Tasya Novian Indah, S. (2023). The Effects of The Blended Project-Based Literacy that Integrates School Literacy Movement Strengthening Character Education Learning Model on Metacognitive Skills, Critical Thinking, and Opinion Expression. *European journal of educational research, 12*(1), 145-158. https://doi.org/10.12973/eu-jer.12.1.145

Zengin, Y. (2017). Investigating the use of the Khan Academy and mathematics software with a flipped classroom approach in mathematics teaching. *Journal of Educational Technology & Society, 20*(2), 89-100.

Appendices

Appendix A

Interview Protocol

INTERVIEW PROTOCOL AND INDICATIVE INTERVIEW QUESTIONS

USE OF ICT TO SUPPORT CRITICAL READING IN BOGOTÁ
QUT Ethics Approval Number 4615

The following steps are proposed as this research's interview protocol:

1. Recruitment of possible participants following the structure abided by QUT ethics committee.

2. Identification of the time when the interview will take place through online communication with each participant. Given the need for online communication, consideration will be given to access to stable and high-quality internet connectivity for both parties and a room code for a Zoom meeting will be provided.

3. One week before each interview, the researcher will send an email reminding the time of the interview.

4. When the interview takes place, the researcher will begin by welcoming the participant and thanking them for their time before explaining the general format of the interview. Before beginning the questions, the researcher will check in with participants asking them to explain, in their own words, what they understand the study to be about, and if they have any questions that the researcher can answer before beginning the interview. Then, the researcher will ask for verbal permission to begin the audio recording.

5. Start the recording of the interview using Zoom and conduct the interview.

6. During the interview, the researcher will politely ask the teacher to provide an artefact that has been discussed and will ask the participant to send an electronic copy of the artefact in a pdf format (so no changes can be made to it after reception) to felipe.monroy@hdr.qut.edu.au. The artifacts proposed for this research may include but will not be limited to archived course management sites or presentations and course assignments designed and used by the interviewed teachers (but not completed student work, so I will

not require the student's permission). Each interviewed teacher will be requested to send a selection of up to 3 teaching and learning artifacts to illustrate ICT integration in their classes. To help the interviewed teacher select the best artifacts, the following criteria based on the work of Mouza and Karchmer-Klein (2013) will be presented to them: 1. The artifact must have been used at least once before this research by the teacher; 2. The learning goals for the artifacts must be clearly stated for the researcher, either as part of the artifact itself or in a side note. 3. The teacher must agree that this specific artifact had a professional relevance on its previous use, either personal or as stated by the students.

7. At the end of the interview, the researcher will ask the participants if they have anything further to add that has not been covered in the interview and will close by explaining the next steps in the research process, including how the recording will be handled.

8. The researcher will thank the participants for their time and sharing their knowledge and experience. The research will also advise the participants of the member-checking process and that he will get back to then when the transcribing of the interview is completed.

9. Member checking. The transcribed interviews will be made into a word document with highlighted excerpts that may require clarification by the interviewee and potentially identifying details the participant may wish to have changed. This document will be sent via email to the interviewee for them to check the veracity of the transcription and of the ideas written.

#	Question	Dimension of TPACK discussed
1	What ICT tools and devices do you use in your day-to-day life?	TK
2	What contents do you usually teach in your Spanish-language courses?	CK
3	Which non-technological methodologies for teaching you use in your classes regularly?	PK
4	Can you please tell me a about your views for using technology with your students?	TPK
5	Do you know software or tools specific to language education? If the answer is yes, please name the software you know and explain what can be done with that software? If the answer is no, is this a lack of professional knowledge? Is knowing such software a plus? Please, detail your answer.	PCK, TCK
6	What ICT tools and devices do you use in your Spanish-language courses?	TCK
7	In what ways do you use any of these ICT tools and devices in your Spanish language instruction?	TPACK
8	How do your students respond to your use of technology in the classroom?	PCK
9	What are the current and potential barriers you face when using technology in the classroom?	TCK
10	What strategies do you use to overcome these barriers?	TPK
11	Do you consider that today's societies and technological changes are being delved deeply enough by the Ministry of Education, the Secretary of Education and other policymakers?	PCK, Context
12	How do you define computer-based language education? What is the meaning of this concept for you? Please, explain it.	TPACK
13	Do you feel that you are able to combine your use of pedagogy, content knowledge, and technological skills to effectively integrate technology?	TPACK

Appendix B

Email to Principals

Subject: Investigación del uso de las TIC para apoyar la lectura crítica

(Research about ICT use to teach critical reading)

Dear Mr. [Last Name]

I am currently studying at the Faculty of Creative Industries, Education and Social Justice of the Queensland University of Technology (QUT), where I am currently enrolled in a PhD program. My research project aims to understand how Spanish language teachers in middle schools of Bogota D.C. are using Information and Communication Technologies (ICT) to teach critical reading.

For my research study I would like to invite Spanish teachers teaching critical reading in middle-school levels at the school I graduated from. To do this, I require your permission as school principal. I have attached a Participant Information Sheet that provides the study details, and a Consent Form for you to sign if you agree for me to recruit teachers from your school.

The study has been approved by the QUT Human Research Ethics Committee (approval number 4615).

I will be glad to answer any questions you may have, and I can be contacted via return email.

I look forward to hearing from you Mr. Fulford. Thank you for your consideration of this request.

Regards

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Appendix C

Participant Information Sheet – Principal

PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT
– Principals –

Use of ICT to Support Critical Reading in Middle Schools in Bogota
QUT Ethics Approval Number 4615

Research team

Principal Researcher:	Felipe Monroy	PhD student
Associate Researcher(s):	Hitendra Pillay	QUT Professor School of Teacher Education and Leadership

Queensland University of Technology (QUT)

Why is the study being conducted?

This research project is being undertaken as part of a PhD study for Felipe Monroy. The purpose of this project is to develop an understanding of how teachers in Bogota D.C. (Capital city of Colombia), are using ICT to help middle year school students to develop critical Spanish reading competencies. The research question that drives the project is: How do Spanish literacy teachers use ICT to teach critical reading in Middle-school settings of Bogotá? The study will adopt a case study method and will collect interview data and artefacts from teachers: the interviews will allow the research team to delve into the perceptions of the sampled participants, while the artifacts will serve to corroborate the ideas stated in the interviews.

I am seeking your permission to invite teachers at your school to participate in the study. Teachers are eligible to participate if:

1. They are currently employed as Spanish literacy teacher in middle-school level in Bogotá
2. They have 5 years or more experience in teaching Spanish literacy classes
3. They use ICT to deliver Spanish literacy and/or critical reading courses

What does participation involve?

Teachers' participation will involve taking part in an audio and video recorded interview with Felipe that will take approximately 1.5 hours of each teacher's time. The interview will be conducted using Zoom. Questions will include:

- What ICT tools and devices do you use in your day-to-day life?
- Which non-technological methodologies for teaching you use in your classes regularly?
- Can you please tell me a about your views for using technology with your students?

During the interview, teachers will be invited to show teaching 'artefacts' such as study guides, manuals, presentations, slides, lesson plans generally use in teaching practice.

Teachers will be invited to discuss these in the interview and the interviewer will ask them to scan these materials and send them immediately after the interview is finished. Alongside the scanned Artefacts, an Image Release form for the scanned materials will be expected.

After the interview, the audio will be transcribed, and I will return the interview transcript to each teacher for review. I will send it via email and it will have highlighted any excerpts that may require clarification, and potentially identifying details for each teacher to peruse and change if desired. This may take an additional 1 hour of their time.

Your school's participation in this research project is entirely voluntary. If you do agree for your school to participate you can withdraw your school's participation from the research project without comment or penalty by emailing felipe.monroy@hdr.qut.edu.au. You can withdraw any time before or during the data collection period. If you withdraw your school with 2 weeks after the teacher interviews have been completed, on request any information already obtained will be destroyed.

What are the possible benefits for me if I take part?

It is not expected that this research project will benefit you or your teachers directly. The outcomes of the research, however, may benefit future students and schools by shining a light on how Spanish literacy teachers use ICT to teach critical reading in Middle-school settings. After the PhD study is completed, I will email participating teachers with a summary of the research findings. You can request a brief summary of the outcomes of the study by email writing to felipe.monroy@hdr.qut.edu.au

What are the possible risks for me if I take part?

There are minimal risks associated with your school's participation in this study. These include inconvenience associated with the time required to read this study information, complete and return the consent form. Teachers who participate may perhaps experience some minor discomfort with the presence of a researcher asking interview questions and viewing artefacts, especially if this is a new or novel experience. The researchers will take all reasonable steps to ensure things run smoothly, that the teachers are comfortable with the process, and we will make good use of their time. We will prioritise teachers' schedules and preferences in negotiating times and modes convenient to them for the interviews to take place. They need only share artefacts that you are comfortable sharing and providing copies of the artefacts is voluntary.

What about privacy and confidentiality?

Data collected as part of this research project will be stored securely as per QUT's Management of research data policy. Consent forms will be stored for 15 years and then destroyed. Data will be stored for a minimum of 5 years and can be disclosed if it is to protect you or others from harm, if specifically required by law, or if a regulatory or monitoring body such as the ethics committee requests it.

Teachers' identities as research participants will be known only to the research team

only. All data that they provide will coded which means that the research team will be able to re-identify you if needed. A re-identifying code stored separately to their personal information (e.g., your name and email contact), will be accessible only to the research team, and the code plus identifying information will be destroyed after the PhD thesis has been examined.

As the research project involves an audio and video recording (taken via Zoom):

- The audio recording will be retained, but the video recording will be destroyed immediately after each teacher interview. This is because Zoom defaults to both audio and video recording. For this study, the video recording is not needed and will be destroyed. Only the audio recording will be used. The audio recording will be retained for the minimum retention period of 5 years after the last research activity.
- The recordings will not be used for any other purpose.
- Only the named researchers will have access to the recordings.
- It is not possible to participate in the research project without being recorded.

Every effort will be made to ensure that the data teachers provide cannot be traced back to them in reports, publications, and other forms of presentation. For example, we will include only the relevant part of a quote, we will not use any names, or names will be changed, and/or details such as dates and specific circumstances will be excluded.

How do I give my consent to participate?

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement for us to contact teachers at your school and ask them to participate.

What if I have questions about the research project?

If you have any questions or require further information please contact one of the listed researchers:

Felipe Monroy	felipe.monroy@hdr.qut.edu.au	+61 0449 749 257
Prof. Hitendra Pillay	h.pillay@ hdr.qut.edu.au	+61 0401 128 116

What if I have a concern or complaint regarding the conduct of the research project?

QUT is committed to research integrity and the ethical conduct of research projects. If you wish to discuss the study with someone not directly involved, particularly in relation to matters concerning policies, information or complaints about the conduct of the study or your rights as a participant, you may contact the QUT Research Ethics Advisory Team on +61 7 3138 5123 or email humanethics@qut.edu.au. You can leave a message in Spanish and the team will arrange for translators to help.

Thank you for helping with this research project. Please keep this sheet for your information.

Appendix D

Participant Recruitment Email

Subject: Investigación del uso de las TIC para apoyar la lectura crítica

(Research about ICT use to teach critical reading)

Hola docentes, mi nombre es Felipe Monroy. Actualmente estoy estudiando un doctorado en la Facultad de Industrias Creativas, Educación y Justicia Social de la Universidad Tecnológica de Queensland (QUT). Mi proyecto de investigación tiene como objetivo comprender cómo los profesores de español en bachillerato de Bogotá D.C. están utilizando las Tecnologías de la Información y la Comunicación (TIC) para enseñar lectura crítica. Para lograr esto, me gustaría contar con 1 hora de su tiempo para una entrevista.

Este proyecto de investigación ha sido aprobado por el Comité de Ética de Investigación Humana de

QUT (número de aprobación 4615).

Gracias, espero conocerlos pronto.

Translated:
Hello teachers, my name is Felipe Monroy. I am currently studying a PhD in the Faculty of Creative Industries, Education and Social Justice at the Queensland University of Technology (QUT). My research project aims to understand how high school Spanish teachers in Bogotá D.C. are using Information and Communication Technologies (ICT) to teach critical reading. To accomplish this, I would like to have 1 hour of your time for an interview.
This research project has been approved by the Human Research Ethics Committee of
QUT (approval number 4615).
Thank you, I hope to meet you soon.

Appendix E

Participant Information Sheet – Teacher

PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT
– Interview & Artefacts –

Use of ICT to Support Critical Reading in Middle Schools in Bogota
QUT Ethics Approval Number 4615

Research team

Principal Researcher:	Felipe Monroy	PhD student
Associate Researcher(s):	Hitendra Pillay	QUT Professor School of Teacher Education and Leadership
	Queensland University of Technology (QUT)	

Why is the study being conducted?

This research project is being undertaken as part of PhD study for Felipe Monroy. The purpose of this project is to develop an understanding of how teachers in Bogota D.C. (Capital city of Colombia), are using ICT to help middle year school students to develop critical Spanish reading competencies. The research question that drives the project is: How do Spanish literacy teachers use ICT to teach critical reading in Middle-school settings of Bogotá? The study will adopt a case study method and will collect interview data and artefacts from teachers: the interviews will allow the research team to delve into the perceptions of the sampled participants, while the artifacts will serve to corroborate the ideas stated in the interviews.

You are eligible to participate in this research project if you:

4. Are currently employed as Spanish literacy teacher in middle-school level in Bogotá
5. Have 5 years or more experience in teaching Spanish literacy classes
6. Use ICT to deliver Spanish literacy and/or critical reading courses

What does participation involve?

Your participation will involve taking part in an audio and video recorded interview with Felipe that will take approximately 1.5 hours of your time. The interview will be conducted using a video conferencing platform such as Zoom. Questions will include:

- What ICT tools and devices do you use in your day-to-day life?
- Which non-technological methodologies for teaching you use in your classes regularly?
- Can you please tell me a about your views for using technology with your students?

During the interview you will be invited to show teaching 'artefacts' such as study guides, manuals, presentations, slides, lesson plans that you generally use in your teaching practice. You will be invited to discuss these in the interview and the interviewer will ask you to scan these materials and send them immediately after the interview is finished. Alongside the scanned Artefacts, an Image Release form for the scanned materials will be expected from you.

After the interview, the audio will be transcribed and I will return the interview transcript to you for review. I will send it to you via email and it will have highlighted any excerpts that may require clarification, and potentially identifying details for you to peruse and change if desired. This may take an additional 1 hour of your time. I will ask you to return it to me within two weeks.
Your participation in this research project is entirely voluntary. If you do agree to participate you can withdraw from the research project without comment or penalty by emailing felipe.monroy@hdr.qut.edu.au. You can withdraw anytime before or during the interview. If you withdraw with 2 weeks after your interview, on request any information already obtained that can be linked to you will be destroyed.

What are the possible benefits for me if I take part?

It is not expected that this research project will benefit you directly. The outcomes of the research, however, may benefit future students and schools by shining a light on how Spanish literacy teachers use ICT to teach critical reading in Middle-school settings. After the PhD study is completed, I will email you again with a summary of the research findings. You can request a brief summary of the outcomes of the study by email writing to felipe.monroy@hdr.qut.edu.au

What are the possible risks for me if I take part?

There are minimal risks associated with your participation in this study. These include inconvenience associated with the time required to read this study information, complete and return the consent form, take part in an interview and review your interview transcript, and collect and provide sample artefacts. You may perhaps experience some minor discomfort with the presence of a researcher asking interview questions and viewing artefacts, especially if this is a new or novel experience. Please know that the researchers will take all reasonable steps to ensure things run smoothly, that you are comfortable with the process, and we will make good use of your time. We will prioritise your schedules and preferences in negotiating times and modes convenient to you for the interviews to take place. You need only share artefacts that you are comfortable sharing and providing copies of the artefacts is voluntary.

What about privacy and confidentiality?

Data collected as part of this research project will be stored securely as per QUT's Management of research data policy. Consent forms will be stored for 15 years and then destroyed. Data will be stored for a minimum of 5 years and can be disclosed if it is to protect you or others from harm, if specifically required by law, or if a regulatory or monitoring body such as the ethics committee requests it.
Your identity as a research participant will be known only to the research team only. All data that you provide will coded which means that the research team will be able to re-identify you if needed. A re-identifying code stored separately to your personal information (e.g. your name and email contact), will be accessible only to the research team, and the code plus identifying information will be destroyed after the PhD thesis has been examined.
As the research project involves an audio and video recording (taken via Zoom):

- The audio recording will be retained, but the video recording will be destroyed immediately after the interview. This is because Zoom defaults to both audio

and video recording. For this study, the video recording is not needed and will be destroyed. Only the audio recording will be used. The audio recording will be retained for the minimum retention period of 5 years after the last research activity.

- The recording will not be used for any other purpose.
- Only the named researchers will have access to the recording.
- It is not possible to participate in the research project without being recorded.

Every effort will be made to ensure that the data you provide cannot be traced back to you in reports, publications, and other forms of presentation. For example, we will include only the relevant part of a quote, we will not use any names, or names will be changed, and/or details such as dates and specific circumstances will be excluded.

How do I give my consent to participate?

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate.

What if I have questions about the research project?

If you have any questions or require further information please contact one of the listed researchers:

Felipe Monroy	felipe.monroy@hdr.qut.edu.au	+61 0449 749 257
Prof. Hitendra Pillay	h.pillay@ hdr.qut.edu.au	+61 0401 128 116

What if I have a concern or complaint regarding the conduct of the research project?

QUT is committed to research integrity and the ethical conduct of research projects. If you wish to discuss the study with someone not directly involved, particularly in relation to matters concerning policies, information or complaints about the conduct of the study or your rights as a participant, you may contact the QUT Research Ethics Advisory Team on +61 7 3138 5123 or email humanethics@qut.edu.au. You can leave a message in Spanish and the team will arrange for translators to help.

Thank you for helping with this research project. Please keep this sheet for your information.

Appendix F

Participant Consent Form

CONSENT FORM FOR QUT RESEARCH PROJECT
Interview

USE OF ICT TO SUPPORT CRITICAL READING IN BOGOTÁ
QUT Ethics Approval Number 4615

Research team

Felipe Monroy Celis	felipe.monroy@hdr.qut.edu.au	0449749257
Prof. Hitendra Pillay	h.pillay@qut.edu.au	+61 7 3138 3030

Statement of consent

By signing below, you are indicating that you:

- Have read and understood the information document regarding this research project.
- Have had any questions answered to your satisfaction.
- Understand that if you have any additional questions you can contact the research team.
- Understand that you are free to withdraw without comment or penalty by emailing felipe.monroy@hdr.qut.edu.au.
- Understand that if you have concerns about the ethical conduct of the research project you can contact the Research Ethics Advisory Team on +61 7 3138 5123 or email humanethics@qut.edu.au.
- Understand that the research project will include an audio and video recording, that the video recording will be destroyed and only the audio recording will be retained.
- Understand that it is not possible to participate in the project without being recorded.
- Understand that the research project will include sharing copies of teaching artefacts and that copies of these artefacts will be scanned and delivered via email.
- Understand that I will be emailed with a transcript of my interview and will have 2 weeks to review and return it to felipe.monroy@qut.edu.au
- Agree to participate in the research project.

Please tick the relevant box below:

Name _____

Signature _____

Date _____

Preferred email address for study correspondence _____

Please return the signed consent form to the researcher

Appendix G

Image Release Consent Form – Artefacts

IMAGE RELEASE FOR QUT RESEARCH PROJECT

USE OF ICT TO SUPPORT CRITICAL READING IN BOGOTÁ

QUT Ethics Approval Number 4615

Your participation in the research project involves sharing scanned images of your professional work with the research team (we have called these "Artefacts"). As well as for the purposes described in the information sheet for the research, the research team would like your permission to use images of your Artefacts (i.e., study guides, manuals, presentations, lesson plans) in presentations and publications arising from the research. This will be for non-commercial purposes only and may include uses like conference presentations, resources for teacher professional development and snapshots in the PhD thesis.

Showing images of your work in this way may reveal personal information about you (for example, your handwriting, your notes) and may mean that family members, friends and other people who may know you become aware of your participation in this study.

You can decline this invitation without comment or penalty. However please note that after the images are published it will not be possible to withdraw.

If you agree to have these images used, please complete and sign the 'image release' consent below.

Research team contacts

Felipe Monroy	felipe.monroy@hdr.qut.edu.au	+61 0449 749 257
Prof. Hitendra Pillay	h.pillay@ hdr.qut.edu.au	+61 0401 128 116

Statement of consent

By signing below, you are indicating that you:

- Have read and understood the information about this image release.
- Have had any questions answered to my satisfaction.
- Understand if I have any additional questions I can contact the research team.
- Understand I can decline this invitation without comment or penalty.
- Understand that if I have concerns about the ethical conduct of the research project I can contact the Research Ethics Advisory Team on 07 3138 5123 or email humanethics@qut.edu.au.

Please tick the relevant box below:

☐ I **agree** to QUT using scanned images of my shared Artefacts (i.e., study guides, manuals, presentations, lesson plans) for this research as described above.

Name _____

Signature _____

Date _____

Please return the signed consent form to the researcher.
A copy will be provided back to you for your records.