St Hilda's College
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DEPARTMENT OF EDUCATION

PERCEPTIONS OF PARAGUAYAN TEACHERS FROM DIFFERENT SOCIO-ECONOMIC CONTEXTS ABOUT THE USE OF TECHNOLOGY IN THE CLASSROOM TO FOSTER CRITICAL THINKING SKILLS

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DISSERTATION SUBMITTED IN PARTIAL COMPLETION OF THE
MASTER OF SCIENCE IN EDUCATION: DIGITAL AND SOCIAL CHANGE

ST. HILDA'S COLLEGE
AUGUST 2022

This dissertation is dedicated to my family that supported me unconditionally from day one; to my friends and mentors who invested in my life and led me to where I am now; to my fellow Paraguayans educators who work day and night in the beautiful profession of teaching; to each one of my students who inspired me to fight for a better future in the Paraguayan education; to God who purposely led me to where I am now. This work is for you all.

ACKNOWLEDGEMENTS

This dissertation would not have been possible without the support of my family, friends and coursemates. I want to thank my family for accompanying me on this journey, my friends for their support and motivation throughout the year, to my coursemates for helping me unconditionally.

I want to thank my supervisor Laura Hakimi for her orientation and guidance during the whole academic year. I want to thank the teachers who generously participated in this study and contributed their time, perspectives and experiences to enrich the diversity of the research. I want to thank the Paraguayan government and the scholarship program "Becas Carlos Antonio López – BECAL" for trusting me and funding my studies at the University of Oxford. This dream would not have been possible without their support and generosity.

Last but not least, I want to thank God for never letting me down during this journey, for providing for me and for bringing peace and calmness during the storms. I want to thank him for the purpose he has given me to live intentionally.

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LIST OF ABBREVIATIONS

CTS: Critical Thinking skills

SES: Socioeconomic Context

ICT: Information and Communication Technology

EdTech: Educational Technologies

OECD: Organization for Economic and Co-operation Development

ABSTRACT

Critical thinking has become a required and highly valuable skill in the academic and professional environment. For that reason, the development of this ability is nowadays a major topic of discussion in the academic and educational sphere. New educational policies mainly focused on the enhancement of critical thinking skills (CTS) are being elaborated for schools and universities. These policies include the use of EdTech since studies suggest that its use helps to foster CTS in the classroom. However, this data is not definitive because many other variables can influence or interfere. Scholars have emphasised the importance of the context-specific study, and there is relatively little research evidence that focuses specifically on the Paraguayan context. Therefore, to contribute to the literature, this study focused on the perceptions of Paraguayan teachers from different contexts about the relationship between EdTech and CTS. One group of teachers work in ICT well-equipped classrooms (Smartboard, surrounding sound system, Wi-Fi, and more) and the other in a traditional setting (classroom with chairs and whiteboard). These teachers were interviewed individually to know what their thoughts are regarding the use of EdTech and Critical thinking development according to their experience. The findings suggest teachers from the low-SES context are more optimistic about the use of technology to improve the learning experience and foster CTS, while teachers from the high-SES context have a more critical and neutral approach toward the use of technology in the classroom.

INTRODUCTION

This dissertation studies the perceptions of teachers about the use of technology and its relationship with the development of critical thinking skills in a Paraguayan context through a case study. The debates about technology in education have been increasing during the last few decades (Epstein & Kernberger, 2006; Erikson & Erikson, 2019; Mason, 2008; Moore & Parker, 2021; NACTA, 2010; Willingham, 2008). Whilst many scholars and educators are in favour of its use, arguing that it can improve the learning and teaching experience in different ways; others are more critical of its use, arguing that many factors determine how effectively technology can support learning in educational settings (see Aagaard, 2021; Biesta, 2013; Crook, 2015; Dron, 2021; Facer, 2013; Macgilchrist, 2021; Selwyn, 2013, 2016, 2019). Educational technologies have been studied in a global context, but little or nothing is known about this topic in the Paraguayan context. Thus, this study sought to obtain more information about teachers' perceptions regarding this issue. The study aimed to explore the understandings and practices of teachers from different contexts in Paraguay regarding the use of educational technologies because it has been studied how the context can influence the approach to education and technology (Bosakova et al., 2020; Hallinger & Murphy, 1986; Hoffmann & Ramirez, 2018). This study engaged with teachers in two schools, one in a relatively affluent socioeconomic context, and one in an area of lower socio-economic status.

The literature review will introduce the reader to ways in which critical thinking may be defined according to different views. Then, this topic will be explored in different contexts such as education, digital space and different contexts. The relevance of critical thinking skills (CTS) from a social justice lens will also be constantly analysed through this study. CTS can be relevant for emerging societies to notice unjust structures that foster inequalities among people (Vincent-Lancrin et al., 2019). Critical thinking is an axis of this research because, through this topic, teachers' perceptions and practices in the classroom will be explored. Therefore, this study has two main axes that are critical thinking and educational technologies. The methodological framework explains why an exploratory case study was chosen as a model to carry out this qualitative exploration and also shows the different stages of data collection and analysis, as well as the limitations of the study.

The finding section shows the results of a deductive thematic analysis that was done to obtain the answers to the different questions. All the findings are contrasted between the two contexts studied in Paraguayan society. In the discussion section, a critical analysis of existing literature alongside the findings of the research is presented. It shows how the findings add or relate to different academic research or writings that were done before in different international contexts. That section also provides recommendations for future similar research.

The conclusion of the study addresses the research questions and explains the importance of the different findings obtained through this study. Briefly speaking, results suggest that teachers from the low-SES context have a more optimistic and technocentric view and higher appreciation of educational technologies while teachers from the high-SES context are more neutral about the use of technology in the classroom. Interesting insights were found about how technology helps to improve the learning process and therefore leads to a better scaffolding to foster CTS, according to teachers. Lastly, in the appendix section, it can be found different files that were used throughout the research such as the ethical procedure, consent forms, question guide for interviews and more. Overall, the research contributes to the academic literature about the Paraguayan educational community and this study could be useful for future reference for many Paraguayan or international researchers that are interested in the same or similar topics.

CHAPTER I

LITERATURE REVIEW

This chapter will discuss different definitions of critical thinking based on already existing literature. After discussing the different concepts, the relationship between critical thinking and different fields will be examined. The idea of critical thinking from a social justice lens is going to be analysed, how CTS can be useful for individuals' lives and democratic societies in general. Then, this idea will be linked to the role of education to foster CTS considering different social contexts to then analyse how educational technologies can be significantly supportive for different practices in the classroom that can lead to the enhancement of CTS. Then, considering that the existing academic literature is based in various contexts, the context of this research will be introduced in the last section to then move into the methodology chapter for further details.

A. What is critical thinking?

Critical thinking has been a topic of discussion for several years. The precise definition of critical thinking, however, has been the subject of much scholarly debate (eg. Cottrell, 2005; Davies, 2013; Epstein & Kernberger, 2006; Moore & Parker, 2021; NACTA, 2010). Some argue that critical thinking is what makes humans different from animals because we can process and reason the information that we perceive during our daily lives (Epstein & Kernberger, 2006). However, critical thinking is not only about processing information but also about drawing conclusions from the input we receive. Epstein and Kernberger (2006, p.1) argue that "it is a defense against a world of too much information".

In addition, some scholars relate critical thinking to a "cognitive activity associated with using the mind" (Cottrell, 2005, p. 1). This cognitive process is mainly used to question what is perceived as truth or an objective fact. In this way, reasoning is used to generate 'constructive' doubt about the world that surrounds us, to analyse and understand it, which enables us to generate accurate information, which, in turn, enables us to make informed decisions (Cottrell, 2005). Innovation through critical thinking is

argued to happen after "skilfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (NACTA, 2010, p. 70). Thus, critical thinking can be argued to be the ability to use cognitive reasoning to solve problems. This term is also related to innovation for developing better plans, more accurate conclusions to hypotheses, and therefore solutions (Moore & Parker, 2021).

However, it is argued that people can make unfavourable decisions for themselves because of irrational or 'blindfolded thinking' due to the lack of critical reasoning (Moore & Parker, 2021; NACTA, 2010). The lack of critical thinking can occur for different motives, such as religious beliefs, biased information, emotions, fanaticism, and others (Cottrell, 2005; Moore & Parker, 2021). That is why, it is argued, the ability of critical thinking is needed to be developed because it is "general to all discipline areas" (Davies, 2013, p. 530). Moore and Parker (2021, p. 22) explain it as follows:

> A composer, for example, thinks critically when he or she tries to find the right instrumentation to introduce a musical theme. A general thinks critically when he or she defines a military objective and weighs various strategies for achieving it. Dentists think critically when they weigh the likely duration of alternative dental repairs against a patient's life expectancy. Mechanics think critically when they attempt to diagnose mechanical problems by listening to the sound of an engine. People in each walk of life examine considerations that are unique to them.

Therefore, critical thinking is an ability that should be developed through scepticism, analysis and rational thought. Cottrell (2005) argues that the word rational means using reasons to justify your ideas or solutions to problems. Then, to develop those reasons, one should be able to listen carefully to others when presenting an argument for something they consider true. For this, it is important to leave emotions aside, compare, contrast and if possible, do research to have a more informed judgment about the fact (Cottrell, 2005).

Consequently, some authors discuss that using critical thinking positively would lead people "to come to conclusions that are correct and to make decisions that are wise" (Moore & Parker, 2021, p. 4). This means that if a person thinks critically, daily emotions, desires, fears, individual aims, and experiences will not affect their choices. The importance for a person to reason correctly is highly relevant to their lives. Correct thinking can lead them towards choices that will help them to participate actively in

society (Soloff, 1989). This skill is usually linked to the ability to question different ideas, ideologies and beliefs which enables people to engage meaningfully in a democratic society (Vincent-Lancrin et al., 2019). If people can engage more in society through democracy that consequently will lead to more voices being raised to provoke changes for the well-being of society. That is to say, critical thinking skills can be important from a social justice perspective.

B. Critical Thinking from a Social Justice Perspective

Social justice is often related to the idea of bringing equality to those communities that have been marginalized through history, in which their context does not allow them to live dignified lives (Avgerou, 2010; Fang et al., 2019). In other words, marginalized communities are in a position of disadvantage that limits their life outcomes. What is the role of critical thinking in this scenario then? Critical thinking is argued to be fundamental for social well-being and personal development (Vincent-Lancrin et al., 2019). It is important for every person so that they can make accurate and best possible personal choices to have a good life (Vincent-Lancrin et al., 2019). In other words, people will be able to analyse certain structures in society and challenge them. These structures can be ones of power, privilege and oppression. Here is where education can play a role in fostering critical thinking skills to achieve social justice.

Educational systems in general have been widely criticized because they can serve to reinforce capitalist structures by mainly developing workers to be integrated into society (Aagaard, 2021; Freire & Ramos, 2017; Tikly & Barrett, 2011). As Freire posits that an educational system can “minimize or annul the students’ creative power" and that “to stimulate their credulity serves the interests of the oppressors, who care neither to have the world revealed nor to see it transformed” (2017, p. 46). Therefore, from a social justice perspective, it is highly relevant to develop critical thinking skills in students so they can question the societal structures, to challenge and improve them.

Educational change is constantly happening due to new technologies as well as other changes in society (Crook, 2015) but few people involved in the educational field question these changes and many of them participate involuntarily (Fullan, 2016). Therefore, it has been argued that the educational system keeps reproducing unjust social

structures in the capitalist system (Aagaard, 2021). This means that students are taught to be functional people for the system instead of being autonomous citizens with own their agency. However, education is not the 'panacea' that will heal society from injustices, and neither will improve social mobility (Brown & James, 2020). Thus, the development of critical thinking skills is not only important for students to question the system but also to make them aware of their skills and capacities to take advantage of opportunities that they will eventually have in life (Saito, 2003).

Hence, education should serve students to make rational choices for their lives and make them aware of what is valuable and not. Saito puts it: "we may want Mary to become a mathematician or an artist, but not a drug addict or a murderer. We need to develop the judgement of the person to be able to value in which way it is appropriate to use capabilities through education" (2003, p. 29). In other words, education should increase learners' agency to pursue "their valued goals in life" (Zheng & Stahl, 2011, p. 71). Agency can be fostered through the development of critical thinking skills so that people can pursue a better life.

C. Critical Thinking for Life

The OECD (Organization for Economic and Co-operation Development) has done a study in eleven different countries to suggest the importance of critical thinking skills for the well-being of societies (Vincent-Lancrin et al., 2019). This organization argues that rationale is important for people and required for most sectors of modern society. This means that critical thinking is a significant skill to get a job or to get a university degree (Vincent-Lancrin et al., 2019). Developed countries are aware of this situation and they are adopting this in the schools' curricula through new educational policies. Additionally, the same agenda is being shared with developing countries to make them design new educational policies around critical thinking skills as well (Vincent-Lancrin et al., 2019). Thus, there is an awareness from international organizations to initiate programmes in educational institutions that help teachers and students integrate and engage in critical thinking in a meaningful manner. In an educational realm, it is important to develop critical thinking skills in students because these abilities are highly valued in university degrees and the labour market (van der Zanden et al., 2020; Vincent-Lancrin et al., 2019).

Vincent-Lancrin and colleagues (2019, p. 39) explain the importance of critical thinking:

> Nowadays, in modern democracies, people are expected to exercise their critical thinking as an integral part of being a citizen, with the ability to make an independent and well-grounded opinion to vote, weigh the quality of arguments presented in the media and other sources of authority. In a digital world in which a multiplicity of facts, views, theories, and assumptions compete, critical thinking has become even more important.

As mentioned before, CTS are not only for individuals' well-being but also for the well-being of democratic societies. In addition, with the advance of new technologies such as machine learning and AI, many jobs that require hard skills are being automated and as a consequence, more companies are looking for people with higher thinking skills that can operate critically in an automated world (Tuomi, 2018; Vincent-Lancrin et al., 2019). Thus, considering the relevance of higher thinking skills for the current labour market and academia, CTS need to be a priority for educational institutions.

D. Critical Thinking and Education

The relationship between critical thinking and education has been argued by different scholars (Doddington, 2007; Erikson & Erikson, 2019; Kwak, 2007; Mason, 2008; Peters, 2008; Soloff, 1989). Education nowadays is seen as the preparation of students for their personal and professional development so they can be relevant individuals in a democratic society (Erikson & Erikson, 2019). However, during this process, many students only receive input on how they should act in society, but they do not critically reflect on the information to make wise decisions for their lives. That is, knowledge is not meaningful for their lives. If this happens in educational systems, then according to Peters (2008, p. 15), students are not truly learning because "learning, in other words, is central to understanding thinking". If students cannot understand the importance of thinking, then the main purpose of education is not achieved. To avoid this, students should be encouraged to ask critical questions and teachers should use methods that motivate students to be creative and active learners (Mason, 2008).

Critical thinking not only helps students to create a meaningful learning process but also to cooperate better with others using "informed judgments" (Soloff, 1989). Nevertheless, teaching and developing critical thinking is not an easy task. One method

could be teaching deliberation in the classroom so students can debate about ideas that they consider important in a respectful environment (Molnar-Main, 2017). Adding to that, even though critical thinking is one of the main purposes of education, it should not be the only one. There are new discussions about how critical thinking can be influenced by context or culture and therefore it should not be a standard to evaluate learners' value and dignity (Doddington, 2007).

Thus, as Kawak (2007, p. 467) mentions, critical thinking in education should serve to "initiate reflection by asking the justificatory reason of the practice so that students might imagine possibilities beyond their current set of commitments or moral beliefs". In this way, critical thinking should be a "central tool for student empowerment" (Erikson & Erikson, 2019).

In an educational paradigm, supporting critical thinking means allowing students to question the structures, methods and assessments that occur in a formal learning setting. However, this does not happen often because when students are told what they need to do to meet approval, a "ceiling is created" (Erikson & Erikson, 2019, p. 2297). This happens because students are more involved in activities that focus on training rather than reasoning. The pupil is a recipient and does not engage with the form of mental activity associated with criticality (Mason, 2008).

These old practices in education are mostly due to behaviourist practices that had a place in schools decades ago and that nowadays remain as the main habits of many educators through the use of new methods (Knox et al., 2020). The behaviourist model of education will hardly promote critical thinking in students since it works based on the stimulus-response practice (Harasim, 2017a) in which education's main focus is on reading, repeating and memorizing (Skinner, 1975). This is what Freire calls the 'banking concept of education' in which the learner only receives input and is not asked to rationalize the content (Freire & Ramos, 2017). Despite the behaviourist model of education, other models are currently more accepted among educators, two of the most widely accepted ones are cognitivism and constructivism (Ertmer & Newby, 2013; Schneider et al., 2022). The first one focuses on fostering the cognitive abilities of learners so that they can receive knowledge in a meaningful manner and base it on previous known or existing knowledge in memory (Ertmer & Newby, 2013). Constructivism focuses more on the idea that knowledge is going to be acquired meaningfully if learners base it on their

personal experiences (Schneider et al., 2022). This means that learners will create their own meaning from the perceived pieces of information and relate it to their environment. These two views of education go beyond the stimulus-response of the behaviourist model, they invite the learner to analyse, question, relate and put into action the knowledge received.

Therefore, to achieve the development of critical thinking in schools, it is better to approach education through the cognitivist or constructivist approach because these consider the learning process in a wider paradigm that pays attention to the different factors that influence learners and their way of thinking (Harasim, 2017b). As mentioned before, if education helps learners to become critical thinkers to analyse their context and make appropriate choices for their lives, critical thinking may increase people's agency, and this could contribute to reducing social inequalities (Vincent-Lancrin et al., 2019). Therefore, critical thinking skills should be fostered in the classroom through these two views, because they provide a wider scope of what learning is and how it should take place (Ertmer & Newby, 2013; Harasim, 2017b; Vincent-Lancrin et al., 2019). However, to measure and foster critical thinking, other variables need to be considered first, such as social context, classroom setting and more.

E. Critical Thinking and Social Context

One relevant aspect of education is the social context of schools and students. The social context can influence schools' organization and curricula (Hallinger & Murphy, 1986), students' perception of the value of education (Hofman et al., 2001), and even educational achievement among learners (Bosakova et al., 2020). Research suggests that students from high and low SES may differ in their cognitive skills (Bosakova et al., 2020; Hofman et al., 2001) which indicates that the social context can affect their critical thinking skills. Hallinger and Murphy compared low- and high-SES schools and suggested that "social class influences the educational beliefs, preferences and expectations of both parent and school staff" (1986, p. 348). They continue explaining that parents from low socioeconomic contexts preferred their children to pursue a vocational education whereas their counterparts preferred their children to follow "intellectual and academic goals", and this led high-SES schools to "offer an academically oriented and rigorous curriculum critically designed to promote cognitive

learning" (1986, p. 348). Therefore, it is highly probable that students from high-SES schools have a greater opportunity to develop critical skills than students from low-SES.

Hofman (2001, p. 172) found out that the cognitive and affective functioning of learners is "shaped by the characteristics of their schools and schoolings". Once again, the results emphasize the cognitive development differences in students from different backgrounds. Hofman (2001) suggests that this can happen due to the exclusivity that high-SES schools (that are usually private) have. They can limit their number of students and also design their own curricula. Therefore, Hofman (2001, p. 191) concludes that "the social context of learning in the classroom is of most importance to pupils' perception of school". This means that the social background of students plays a significant role in how they perceive the learning experience.

In a different study, the results suggest that "children with low family affluence were, compared to children with high family affluence, more likely to dislike school and do not care about education" (Bosakova et al., 2020, p. 1418). The researchers explained that this is likely to happen because parents from high-SES can show the value of education to their children as well as reinforce their learning experience. On the other hand, parents from low-SES are not capable of this due to their tough background or else cannot afford elements or professionals to enhance their learning experience (Bosakva et al., 2020). The academics conclude that personal capacities and school satisfaction "highly depends on the family and school context in which the child is raised" (2020, p. 1418). The social context influences students' development due to various factors such as family, school equipment, students' resources and more.

In regards to school equipment, recent theories (Selwyn, 2013; Yagci, 2014) have suggested that nowadays students are a digital generation because they are constantly exposed to digital tools and information. Selwyn (2013) suggests that this exposure to informal learning made students become active learners and no longer passive receptors. Thus, it can be argued that the use of technology is becoming an important part of education. Nonetheless, due to the digital divide, only students from high-SES contexts benefit from the use of technology most of the time (Fang et al., 2019; Mansell, 2017). In this aspect, the social context also plays a role because as mentioned before, school equipment also depends on it. Private schools can afford the newest technologies while public or low-SES private schools lack the budget to equip classrooms properly

(Macgilchrist, 2021; Rafalow & Puckett, 2022). However, a question must be asked: How important is the use of technology to foster CTS?

F. Critical Thinking and EdTech

The relevance of EdTech or ICT in education has increased during the last decade. Technological changes are shaping society importantly and these changes include educational institutions (Knox et al., 2020). Technology is shaping the way teachers deliver knowledge as well as how students perceive and receive it (Biesta, 2013; Crook, 2015; Säljö, 2010). The importance of these technologies is such that the United Nations included them in their 2030 Agenda mentioning the significance of digital competence (Ovcharuk et al., 2020). The increasing incorporation of technology into teaching practices, combined with a greater policy emphasis on critical thinking skills, has led to growing attention on how technology could be used more effectively to foster CTS. Research is being done on how these technologies can support critical thinking development (Le, 2019) and other studies have shown an interesting correlation between digital tools and critical thinking skills (Daud & Husin, 2004; McMahon, 2009; Shkvyr et al., 2020). The results of these studies indicate that using EdTech in the classroom slightly improves the teaching and learning experience in some scenarios.

As mentioned before, learners nowadays are exposed to informal learning due to constant interaction with digital devices (Selwyn, 2013). As Crook (2015, p. 28) explains, "digitization shapes how we interact with material artefacts but it also shapes our social lives, functioning to offer new points of reference within the interactions we cultivate with others". Therefore, the inclusion of EdTech in schools looks like a priority for educational institutions to engage with the 'digital generation'. However, ICTs should be "adaptable to the audience" and educators should "pay attention to the technological aspects of his/her digital competence" (Ovcharuk et al., 2020, p. 2). Those are remarkable points because technology in schools is not very useful if they are not adequate for students or if teachers are not capable of using them properly. Thus, teachers should be trained and motivated to include the use of EdTech in their lessons, otherwise, it could be a waste of resources (Lei & Morrow, 2010). That is, it is important to invest not only in technology but also in the digital literacy of educators.

Daud and Husin (2009) research suggested that using computer software slightly improves the critical thinking skills for literary interpretation. More recent findings indicate that after the use of digital tools with primary school pupils, they were more capable of thinking more critically about their decisions and justifying them as well as searching for information that would help them to communicate their ideas (Shkvyr et al., 2020). In other words, it helped students to become more autonomous. Extensive research done in Australia indicates that students who were digitally immersed for more time than others developed better critical thinking skills (McMahon, 2009). The author mentions that students from a 'technology-rich environment' are better at using high-order thinking skills than students who were in touch with technology for less time (McMahon, 2009). Besides, scaffolded practices using technology were found to be very helpful for students learning in the long term (Marczak, 2019).

Based on the studies previously mentioned it can be argued that technology can influence positively the learning experience if it is correctly used. Nevertheless, considering the social context of different schools, students and teachers, it is also possible to imply that people from high socioeconomic status are more likely to participate in a 'technology-rich' environment that allows them to foster their critical thinking skills. While on the contrary, people from low socioeconomic status are less likely to have this opportunity and therefore are not able to develop the same critical reasoning skills. This also increases social inequalities because students from low SES are less likely to succeed in the system (Freire & Ramos, 2017). However, the results of the studies previously mentioned are not definitive to determine an absolute conclusion because measuring and fostering critical thinking skills is a task that varies a lot depending on the student, teacher, social context and school aims and curriculum.

G. Measuring and Fostering Critical Thinking Skills in the classroom

Different researchers have been trying to measure critical thinking for decades such as Watson and Glaser (1965) as well as Peter Faccione (1990). They developed and validated their own tests to measure critical thinking. These tests are still used nowadays by many professionals for different purposes, for instance, businesses, education, health and more (AssessmentDay, 2021; Carter et al., 2018; Pearson, 2021; Walsh &

Seldomridge, 2006). Walston-Glaser Critical Thinking Appraisal (WGCTA) and the California Critical Thinking Skills (CCTS) were used in different studies to measure general critical thinking skills (Carter et al., 2018; Walsh & Seldomridge, 2006). Although the results showed that these tests are highly useful to measure general thinking abilities, they are not precise regarding specific thinking skills for different fields of work.

These tests are mainly based on the RED model of critical thinking that was developed by Pearson (AssessmentDay, 2021; Pearson, 2021; Wulandari et al., 2021). This model consists of making individuals distinguish between facts, opinions, and assumptions. That is, they are introduced to questions and arguments that they have to evaluate and answer if they are weak or strong, coherent or incoherent, etc. (Watson & Glaser, 1965; Wulandari et al., 2021). This model is called RED due to the critical thinking skills it measures: 1) Recognize Assumptions, 2) Evaluate Arguments, and 3) Draw Conclusions (Wulandari et al., 2021).

All of the instruments mentioned before are based on numerical/quantitative data and results. They have certain reliability but do not encompass many aspects of the rational reasoning of individuals. However, there have been qualitative attempts to measure critical thinking as well. A qualitative study was done in different primary schools in Chile which sought to develop an accurate instrument to measure critical thinking in 3rd graders from different socioeconomic statuses (Gelerstein et al., 2016). They adapted Julio Verne's graphic novel 'around the world in 80 days' and included questions that required students to use critical thinking skills. Researchers defined that the main skills that a student needs to think critically are "interpretation, analysis, evaluation, inference, explanation, and self-regulation" (Gelerstein et al., 2016, p. 41). They also mention that "the questions were developed in such a way that they would appear throughout the story. In total there were 29 questions, composed of 42 items with achievement indicators" (2016, p. 42). This qualitative instrument measured the skills that the researchers were looking for according to their research.

Despite having different instruments to measure critical thinking skills, they cannot be measured to their fullest due to different variables that escape from the scope of the methods used. Critical thinking is difficult not only to measure but also to teach. CTS encompasses a wide range of skills that can vary depending on students' age, subject, abilities and more (Willingham, 2008). That is why, CTS is difficult to teach and foster,

in spite it is a valuable skill in this century (van Gelder, 2001; Willingham, 2008). The OECD tried to define what the educational field understands as critical thinking to then elaborate on different rubrics to foster it (Vincent-Lancrin et al., 2019). However, despite having a plan and a rubric, teachers were in charge to adapt them to their subjects along with their methods and different pedagogies (Vincent-Lancrin et al., 2019). It means that despite having an agreement on the concept of critical thinking and the rubrics to foster it, teachers play a fundamental role while enhancing CTS. Therefore, teachers' practices to foster critical thinking skills can vary and they can have different methodologies depending on their teaching style and the subject they teach.

Fostering critical thinking skills in the classroom can happen in different forms. However, after the digitalization of society, many schools started to implement ICT in the classrooms which became the main educational tool in most schools, especially after the pandemic (Christopoulos & Sprangers, 2021). For this reason, many teachers had to learn how to use digital educational technologies and adapt them to their lessons which implicated complications for those who were not familiar with them (van den Beemt & Diepstraten, 2016). Although educational technologies became a 'must' in schools, there is no significant data that supports the narrative that these tools significantly improve the teaching/learning process (Facer & Selwyn, 2021; Säljö, 2010).

The enhancement of critical thinking skills by teachers depends on different factors such as their own experiences, their vision of learning, their methods of teaching or even their own conception of critical thinking (van der Zanden et al., 2020). Consequently, it is possible to propose that the influence of EdTech in critical thinking will depend on the use that teachers give them. According to a study, the appropriate use of digital technologies in education can elaborate a learning environment where critical thinking skills can be developed (Ariawan & Malang, 2020). That is why it is important to take into consideration the teachers' perspectives on the use of EdTech for educational technologies. The qualitative considerations of teachers regarding their perceptions and practices will provide an interesting view of CTS and technology according to their social context, which will consequently enrich the discussion and panorama that surround these topics.

H. Paraguayan Context

Over different periods of time, Paraguay has been considered one of the less developed countries in South America (Pereyra, 2008; Stimson & Labelle, 1971), which consequently led to having one of the less efficient public educational systems in the region (COPROFAM, 2020). This means that 59 out of 100 students do not even finish secondary school, one of the highest dropout rates in the region (CES Chair of Education Systems, 2022). It also means that students cannot achieve the minimum in international assessments, such as PISA-D (COPROFAM, 2020). In Paraguayan education, there is a significant divide between private and public education (Murillo et al., 2020; Pereyra, 2008). Generally, Paraguayans who can afford private education are surrounded by better educational resources than public ones (Pintos, 2017). It is considered that private education is for the rich and public education is for the poor (Murillo et al., 2020). According to the last census, there are 8,295 schools of which 7,104 are public; 590 are chartered (mostly subsidized by the government), and 601 are private (REDEM, 2018). According to the last census from the Ministry of Education and Sciences, there were 1,389,655 students enrolled, of which only 142,409 attend private schools (MEC, 2018). This means that only near 11% of all students attend private institutions. Recent findings show that these students perform better in different evaluations than students from public schools (Agencia de Información Paraguay, 2018; Pintos, 2017).

This situation reflects and perpetuates a social divide, where students from high-income private schools have better classroom equipment, more prepared teachers and a better learning environment, while students from low-income schools do not. Concerning educational technologies, in public and low-income private schools, both teachers and students have to deal with issues that complicate the development of the lessons such as lack of ICT equipment, poor internet connection or even lack of teachers' training to use these tools (Caballero et al., 2020; V. Canese et al., 2021). This became even more visible after the pandemic, where the situation forced teachers, parents, and students to acquire digital tools for lesson development (Mereles & Canese, 2020). The schools' lockdown exposed the disparities between the two contexts because technology suddenly became essential for educational activities (Mereles & Canese, 2020).

As mentioned before, studies suggest that the proper use of ICT can positively influence the critical thinking skills of students (Daud & Husin, 2004; McMahon, 2009;

Shkvyr et al., 2020). However, access to ICT in schools is a privilege that only a small proportion of people have access to. It was already mentioned that teachers also play a role in the development of critical thinking which is fundamental because CTS are highly demanded by universities and jobs in Paraguay (M. Canese, 2017, 2020). For all the reasons mentioned, it is important to gain a better understanding of the teachers' perspectives on the influence of educational technologies on critical thinking in students.

Therefore, this study aimed to understand the teachers' perceptions about critical thinking and if they think that educational technologies can help to enhance these skills in the classroom. To find it out, this research established one general question and three specific questions. The specific questions led to the response of the general one. The questions are the following:

GQ: What are the perceptions of Paraguayan teachers from different socioeconomic contexts about the use of technology to foster critical thinking skills in the classroom?

SQ1: What are teachers' conceptualizations of critical thinking?

SQ2: How do teachers foster critical thinking skills in the classroom?

SQ3: What is the role of technology to foster critical thinking skills according to teachers?

To answer these questions, teachers from high- and low-SES contexts schools in Paraguay were interviewed.

CHAPTER II

METHODOLOGICAL FRAMEWORK

This study sought to obtain and analyse the perceptions of Paraguayan teachers about fostering critical thinking skills in their pupils and how they might be supported using technology in the classroom. The study's methodology has been influenced by the principles of case study design, and a qualitative approach was used because qualitative data is argued to be the most effective form to collect teachers' perceptions and subjective experiences related to the phenomenon studied (Denzin & Lincoln, 2018; George & Bennett, 2007). The teachers who shared their experiences, views and perceptions work in two different schools: high-income and low-income socioeconomic contexts. This chapter will describe the context where the research is carried out, the reasons why an exploratory case study was selected as a framework for the study's methodology, how the participants were selected and how the data was collected and analysed. In addition, the limitations of this study are explained at the end of the chapter

A. Research Context

This study has been informed by a case study design because it seeks to investigate a current issue that is not clearly comprehensible and thus it seeks to analyse and describe it qualitatively (Mfinanga et al., 2019). This means that this study seeks to comprehend a "contemporary phenomenon within its real-life context" (Yin, 2002, p. 13). The study takes place within the educational context in the capital of Paraguay, Asunción, which experiences great disparity in school resources and socioeconomic contexts. A comparison between both contexts regarding the use of technology in the classroom has not been deeply studied yet in Paraguay and therefore an exploratory case study was carried out to obtain more empirical information about this topic (Coghlan & Brydon-Miller, 2014). This case study aims to explore more about the use of educational technologies in the classroom and how it varies depending on the context, starting from the perspective of different experienced teachers (who have been involved in Paraguayan education for at least 5 years) from both contexts.

B. Research design

To develop this research, the principles of a case study design were followed for varied reasons. First of all, the case study design was chosen as a model to specifically study a single unit, in this case, a group of teachers that come from the two different contexts already mentioned (Coghlan & Brydon-Miller, 2014). The researcher had the experience of working in two different environments, one being a prestigious and highly costly private school and the other one being a missionary private school that functions in a low-SES context and depends on small donations from churches and international organizations. During that experience, he could notice the different appreciations of the teaching staff toward technology. Thus, it was valuable to situate this case in Paraguay and see how teachers from two different contexts value technology in the classroom and how they use this tool to foster CTS.

However, due to different limitations in the study, which are going to be stated in a different section, this research sought only to illustrate the case in Paraguay. Thus, this case study was done "to render description" (Gustafsson, 2017, p. 4). This description will add important literature to the Paraguayan context given the fact that the educational field in this country considerably lacks academic literature. To describe the educational situation in Paraguay regarding digital technologies and teachers' perceptions, a qualitative exploration was done. This means that a group of people with different backgrounds were studied to acquire a wider understanding of the phenomenon previously mentioned (Gustafsson, 2017; Teegavarapu et al., 2008; Yin, 2002). The perceptions of the individuals who participated were needed to help to identify variables, structures and possible interactions between them and their reality to expand the understanding of this specific context.

Another reason why a case study design was highly compatible with this qualitative exploration is that this design is very efficient when studying individual experiences (Starman, 2013). Therefore, an explanatory qualitative study was needed to later describe the situation of digital education in Paraguay through the teachers' views on it. It is important to not forget that teachers were also asked to share their views on how technology plays a role in the teaching/learning experience and critical thinking development. The group of teachers were not selected based on sampling, but they were

purposely selected because they could provide interesting, unusual and perhaps relevant information about the case being studied (Starman, 2013).

Thus, the main objective was to explore how teachers from two different contexts in Paraguay perceive the use of technology in the classroom for their teaching practices and how it might influence critical thinking skills. Therefore, to answer questions such as 'how' or 'why' usually a case study design is used (Mfinanga et al., 2019; Teegavarapu et al., 2008). Hence, to explore more the phenomenon previously described, this study attempted to answer three specific questions that eventually led to responding to the general question. As priorly stated, these questions are:

GQ: What are the perceptions of Paraguayan teachers from different socioeconomic contexts about the use of technology to foster critical thinking skills in the classroom?

SQ1: What are teachers' conceptualizations of critical thinking?

SQ2: How do teachers foster critical thinking skills in the classroom?

SQ3: What is the role of technology to foster critical thinking skills according to teachers?

C. Justification of the study

This study aims to provide context-relevant data. The research does not seek to generalize the results but to provide more information about how perceptions of the use of technologies in the classroom might differ in different contexts. From a social justice perspective, this study also helped to analyse, describe and contrast two social contexts within an emerging society such as Paraguay. The data and findings are also valuable because educational information about Paraguay is considerably scarce. Thus, a barely studied society could benefit from the information and results provided. To carry out this qualitative research, the subject of study was not selected because it was a representative sample but because it was unusual (Starman, 2013). That is to say, the research was done in an unusual context that is barely studied by elite institutions such as the University of Oxford. This means that this study could possibly raise more interest in Paraguayan society and its educational context.

Even though this study could have adopted the grounded theory design, it did not because it does not seek to establish a new theory from the data generated (Creswell &

David Creswell, 2018). First of all, the main purpose is to explore the context and encourage more research from the results. This means that the aim is to get data for further analysis rather than look for a statistical generalization to ground a new theory or significantly support or challenge existing theories (Teegavarapu et al., 2008). The study sought to *understand more* about the relevance of educational technologies in different Paraguayan contexts and how teachers perceive that they can be used for enhancing critical thinking skills.

Thus, given the fact that the study is informed by a case study design, it has a qualitative methodical approach (Mfinanga et al., 2019; Starman, 2013). To obtain the experiences of the participants, semi-structured online interviews were used. This does not mean that other types of instruments could not be used to gather and understand personal experiences better but that interviews were considered the most suitable form of data collection for this research. It is a process that fosters communication because a meaningful conversation is developed (James & Busher, 2011; Waitford, 2001). In-depth responses were sought from the interviewer to receive information as detailed as possible, which would have been difficult to obtain otherwise (May, 2011; Robson & McCartan, 2016). Whilst it would have been preferable to employ further qualitative methods to offer some data triangulation, in order to strengthen the results and findings of the research (Dubey Mishra & Jovitarasundram, 2017), there were some practical constraints that limited possibilities for further data collection. These are mentioned in the limitations section at the end of this chapter.

D. Setting and Participants

1. Setting

It is important to remark that the following observations were done by the researcher, who worked in both institutions. These observations were also explored and verified throughout the data collection for this study. Both schools are located in Asuncion, the capital city of Paraguay. They are private schools that operate in completely opposite contexts. While one school is a prestigious and exclusive private school, the other is a missionary private school that operates in a low SES. . Although the low SES

school is a private institution, students do not pay tuition due to a scholarship programme that is founded by an NGO from Canada. This means that almost the totality of students does not have to pay to study in the institution. The school from the high SES has the latest equipment on ICT. The classrooms are equipped with smart TVs, smart boards, projectors, a surround sound system, and an excellent internet connection. Teachers generally have their own classroom with all this equipment and their personal computer and user given to them by the school. On the other hand, the school in the low-SES neighbourhood has a more traditional school setting. The classrooms are equipped with only a whiteboard. Practically no ICT tools are installed in the classrooms. Students from this school only use ICT in the computer science lab. Teachers need to bring their own laptops in case they need to use technology for the class and also borrow the projector from the computer science lab to use digital audio-visual aids. In addition, most teachers do not have their own classroom for the subject they teach. They have to move during the day to different classrooms across the school according to their schedule. The high SES school also provides teachers with an educational platform where they upload their plans, comments and assessment of their respective groups. They can keep a record of students on this platform and also parents can follow their children's performance. In the other school, teachers still work on paper-based documents to elaborate their plans, observations and assessments. In both schools, the use of phones is banned unless the teacher asks for them to develop a lesson. Both schools have to follow the same curricula from the Ministry of Education and Sciences in Paraguay. The high SES private school follows this curriculum but also complements it with a bilingual one (English-Spanish) while the low SES school does not. It mainly follows the national curriculum plus some extra-curricular subjects such as Music, language 3 and programming. Thus, given these significant variations in both contexts, the study sought to explore differences in perceptions and practices of teachers that work in these schools.

2. Participants

Distinct characteristics were considered in the participants to select them. Five teachers from each school were selected, given a total of ten participants. Teachers must have had at least five years of teaching experience in secondary schools. This experience was expected to allow them to meaningfully contribute to the research through their

teaching experiences and expertise. Experienced teachers will be more likely to have diverse familiarities with the process of the digitalization of education in Paraguay. The secondary school experience was considered because it is in this stage of schooling that students start to develop abstract reasoning according to Piaget's stages (Lourenço, 2016; Piaget, 1928, 2003). This means that in secondary school, teachers can engage in critical and abstract reasoning with their students because they can already widely understand concepts beyond material reality (Piaget, 1928). Therefore, the participants of this study fulfilled these two characteristics to participate in this study.

Participants were purposely selected according to their educational experiences. Teachers from both contexts that were considered most adequate for the study were contacted to take part in the research. They voluntarily agreed to participate in the study. The ethical procedures from The University of Oxford were followed (see University of Oxford, 2022), they were contacted through email and informed about the research project. They signed a consent form that explained the interview process and protocol and what they had to expect (see Appendix 6). The following table gives a brief description of the participants that were part of this research.

Table 1. Participants characteristics

Participant number	**Teaching subject**	**Years of Experience**	**Context**
Participant 1	Computer Science	14	Low-SES school
Participant 2	Music	5	Low-SES school
Participant 3	Biology/Science	10	Low-SES school
Participant 4	Philosophy	5	Low-SES school
Participant 5	Math/Physics	22	Low-SES school
Participant 6	General Studies	+30	High-SES school
Participant 7	Religion	25	High-SES school
Participant 8	Music	20	High-SES school
Participant 9	English	27	High-SES school
Participant 10	English	16	High-SES school

Due to time constraints, which are going to be further explained in the limitations section, only ten teachers were selected. As mentioned before, they were intentionally selected because of many factors. The main one was their years of experience, availability of time and willingness to participate. The researcher had the opportunity to work with most of these teachers before, which facilitated the contact for the interviews and the conversations with them. Since the researcher is related to both contexts he could engage meaningfully with the different participants during the interviews. Although there are important considerations related to having pre-existing relationships with participants.

E. Data Collection

As mentioned before, online interviews were used to gather the needed data. Open-ended questions were asked during the interview (see appendix 1). The interviews were semi-structured and follow-up questions were used often in order to obtain as much information as possible. The interviews were done through Zoom and participants had the choice to turn off their cameras if desired. The interviews lasted on average between 25 and 40 minutes and were done over a period of two weeks (see appendix 2). The conversations were in the Spanish language to allow teachers to express themselves in their native language and avoid in this way any difficulty in communication. The translation and interpretation of the teachers' transcripts were done by the author of this research which implies certain limitations that are addressed later in the last section of this chapter.

The Zoom platform was selected due that this software was the most popular in the educational context in Paraguay. The use of Microsoft teams was intended, as the University's preferred platform, but few teachers had access to this software. Therefore, to facilitate the online interviews, the researcher opted for Zoom. Ten questions were used as an initial structure for the interviews (see appendix 1) and in some of them, follow-up questions were asked. All participants decided to turn on the cameras during the interviews. Technical limitations appeared during some of the interviews (see limitations of the study).

F. Data Analysis

The data was transcribed manually, and a deductive thematic analysis based on the research questions was done. The deductive analysis was done because the interviews followed a semi-structured questionnaire that was intentionally planned to answer the research questions. This means that the theory determined the data collection and coding scheme and not otherwise, which is the case of inductive analysis (Cho & Lee, 2014; Galeitzke et al., 2019). The raw transcriptions were obtained through the dictation feature of Microsoft Word that automatically transcribed the audio from the videos. In this way, all the data of the participants is stored in the One Drive server of the University of Oxford, hence following the research integrity and ethics protocol from the university (University of Oxford, 2022). The files were re-edited manually to correct some words that Microsoft Word did not understand or misspelt. This means that the author of this study rewatched the interviews to obtain a precise transcription for the data analysis.

After having the raw transcripts, each one of them was coded in a different document (see appendix 3). The transcripts were coded in 8 overarching themes that are (see figure 1). All these main themes were coded again in subthemes to categorize them more accurately. The subthemes varied depending on the context. It is important to remark that even though all the transcripts were individually analysed, they were grouped according to the interviewee's context. This means that the coding of the five teachers from the low SES school was compared among each other and analysed together to reach the main findings. The same was done with the transcripts from the high-SES school teachers. After that, a general analysis of the findings from both contexts was done to compare them and understand the differences and similarities.

All the data was managed privately and only the author had access to it. The interviews are stored encrypted in the university's one-drive cloud to protect the identity and information of the participants. All responses were kept anonymous, and participants had a certain period of time to retract their data from the research if desired. All the data collection and analysis were done following the CUREC protocol from the University of Oxford (see appendix 5). Some limitations during the data collection and analysis are discussed in the next section.

Coding Scheme consisting of eight main themes and subthemes		
Main Categories	**Subthemes Low-SES**	**Subthemes High-SES**
Paraguayan Context	Lack of digitalization	Privilege Awareness
	Lack of digital literacy	Cultural Barriers
	Limitations to foster CTS	
Teachers' Role	Learning and Teaching Digital Literacy	Teach the correct use of technology
	Foster Critical Thinking skills	Keem themselves updated
		Innovate
Definition of Critical Thinking	Process Information	Process infomation
	Think for oneself	Problem Solving
Teachers' Perception of CTS in the Classroom	Lack of interest	Lack of interest and participation
	Individual interest	Uncertainty abou tech and CTS
Importance of Critical Thinking	CTS for Life	Discen information and decision making
	Society Wellbeing	Avoid Manipulation
Teachers' Practices to Foster CTS	Encourage curiosity and autonomy	Using Edtech
	Analysing practical cases	Diverse methods (debates, presentations, stimulus)
Perceptions of the use of Technology in the Classroom	Technology as a must	Technology as a need
	Digitalization and traditional methods	Keep a balance
	Digital literacy for tech use	
Relationship Between CTS and EdTech	Learning Experience and Support	Tech as a support for CTS
		Tech is not fundamental

Figure 1. Coding Scheme

G. Limitations of the study

As mentioned before, it is not possible to generalize the results to a wider population and it is also important to consider that case studies contain inherent biases toward the researcher's preconceptions (Mfinanga et al., 2019; Starman, 2013). It is necessary to remark on the positionality of the researcher and how it can accentuate certain biases during the research (Bourke, 2014). However, despite the inherent biases that the researcher might have had during the study, the research did not aim to obtain any individual benefits for the researcher, but it sought to widen the understanding of the Paraguayan educational context. The author of this research worked closely with most of the people interviewed before undertaking this study, which could have influenced their answers. This means that their responses could have not been their accurate opinion or thought because the participants might have adapted their discourse to sympathize with

the researcher. To avoid this, the author encouraged the participants to feel free to express their thoughts as they would like to. The researcher also tried to formulate questions neutrally to avoid any inference from the responses. Thus, as the researcher had a friendly relationship with the interviewees, most of them were former co-workers, the integrity of the responses might have been affected (Bourke, 2014).

The experiences of the participants are subjective by their nature and to this, it is necessary to add the subjective interpretation of the researcher (Bourke, 2014; Eisenhardt, 1989; Starman, 2013; Yin, 2002). However, the notions of the researcher are present in practically all types of research and hence, it is important to remain cognisant of the possible effects (Coghlan & Brydon-Miller, 2014). To avoid this, research based on a case study design needs to do data triangulation using different data sources to construct validity and/or strength the results of the research (Dubey Mishra & Jovitarasundram, 2017; Eisenhardt, 1989; Yin, 2002). However, due to time constraints, such triangulation could not be done. The research was done during an MSc programme in education at the University of Oxford which lasts 10 months. The empirical research was conducted only for four months which limits the data collection process and analysis as well as the budget. This brief period of time made difficult the triangulation of data to obtain more information from more teachers with similar experiences in Paraguay using different methods. With more time and budget to carry out the research in Paraguay, more extensive and different data collection could have been done, such as class observation, national teachers survey, or even develop a test to measure the critical thinking skills of students from different contexts. All this data would have provided richer findings regarding the Paraguayan educational context that would add significantly to the educational academic literature.

Another limitation of the present study was the language in which the interviews were conducted. All of them were conducted in Spanish because since the interviewees come from different contexts, not all of them were proficient in English. Therefore, translations were done when citing directly and also to identify the patterns. This can affect the semantic meaning of the concepts that were expressed by the participants in the interviews (Temple & Young, 2004). The author himself translated the answers considering he is a Spanish native speaker and fluent in the English language. He also is related to the linguistic context in Paraguay which could help to provide more precise

translations for the data analysis and results. Nonetheless, it is difficult to fully obtain the holistic meaning of the words said by the participants as well as avoid the inherent biases in the researcher (Temple & Young, 2004).

There are also a number of technical limitations to the methods employed in this study. The use of Zoom was opted for because most teachers in Paraguay had access to this software and were remarkably familiar with it. Some parts of the interviews were interrupted due to poor internet connection. In those cases, the researcher asked the participants to repeat what was lost or the whole answer. Some participants had a tight schedule and they tried to go through the interview quickly. This happened with some teachers from the high SES school. The time zone differences were also a factor that might have negatively affected the quality of the interviews. When the interviews were done (see Appendix 2) there were five hours of difference between the Paraguayan time zone and the United Kingdom one. This caused the researcher to have to do some interviews late at the night, which means that the tiredness of the researcher might have reduced the quality of the conversations held during some of the interviews.

CHAPTER III
FINDINGS

This chapter will describe the findings of this study. The deductive analysis of the data was done in order to answer the specific research questions which consequently will answer the general question of this study. The questions are the following:

GQ: What are the perceptions of Paraguayan teachers from different socioeconomic contexts about the use of technology to foster critical thinking skills in the classroom?

SQ1: What are teachers' conceptualizations of critical thinking?

SQ2: How do teachers foster critical thinking skills in the classroom?

SQ3: What is the role of technology to foster critical thinking skills according to teachers?

Thus, this chapter will discuss each of the research questions and their respective responses will be provided in different sections. Supporting evidence for each theme will be presented in different tables, before embarking on more critical analysis. Most tables can be found in the appendix and others were kept along with the analysis for a better understanding. In addition, the findings will be portrayed according to their context. It will be important, however, to look across these findings. That means that the data from the low and high SES was analysed separately and later compared. The first five participants are from the low SES and the following five are from the high SES.

A. Specific Question One: What are the teachers' conceptualizations of critical thinking?

To answer the research question "What are teachers' conceptualizations of critical thinking", two questions were asked during the different interviews, which were: "How would you define critical thinking based on your experience?" and "Do you think that critical thinking is important? Why?". These two questions were posed to establish understandings of and attitudes towards CTS. The findings are presented according to their context.

1. Teachers' Perception of CTS in the classroom

An interesting finding was that teachers gave their perceptions of their students' critical thinking skills according to their subjects without asking them directly (See Appendix 7). Participant 1, who is a computer science teacher, was explaining that he could notice how there are students that seem to have more developed critical reasoning or who "stand out" from the rest. He explained that this sometimes is something difficult to deal with because this kind of student is always ahead of the group and therefore, he needs to prepare more challenging activities for them. Participant 2, who is a music teacher, mentioned that he was able to notice some critical reasoning in his high school students when they started to question the lyrics of the song that they sing. Participant 3 (biology/science teacher) and 5 (Maths/Physics teacher) mentioned that students tend to be reluctant to analyse and think carefully during their lessons. However, participant 4, who is a philosophy teacher, mentioned that it is the teacher's responsibility to try to make students think critically because that will lead them to be agents of good for society.

It is interesting to see how their perception of critical thinking skills in students in their lessons varied a lot depending on their subject. This may suggest that students engage differently depending on the subject they are in. It also may indicate that their concept of critical thinking would also be different from each other. On the other hand, the participants from the high-SES context also gave their perception of students' critical thinking skills during their lessons (see appendix 7). Again, they were not asked about this directly, they gave this information as they were explaining their concepts of critical thinking or answering another question. Their answers could be classified into two different themes that are "lack of interest and participation" and "uncertainty".

The first subtheme identified was the lack of participation and interest because teachers gave moderate emphasis on this topic. Participant 8 (a Music teacher) emphasized that many times students are reluctant to meaningfully engage in the lessons because they do not find the subject useful. Participant 10 (English teacher) mentioned that many students do not want to participate and therefore they ignore her questions. Similar to participant 1, she mentioned that there are indeed few students that are willing to participate, engage and question during the lesson that is being developed. However, the majority of students are reluctant to critically engage with the content being taught. Participant 6 and 9 expressed their uncertainty about the enhancement of CTS through

technology or the traditional curricula. Participant 6 (a General Studies teacher) said that she is not sure about how the use of technology would help students to think critically (this is further discussed later). Participant 9 mentioned that our definition of intelligence sometimes is very narrow and sometimes being "intelligent" in that context does not necessarily mean having the ability to think critically.

2. Definition of CTS

After the analysis of their responses, two main concepts of critical thinking were identified. The different answers they provided were categorized into two themes:

Definition of CT	
Key concept / Word / phrase	**Supporting declarations**
Process Information	**P1:** because thinking critically is to be able to gather information, analyze a problem, a specific problem that is presented and analyze that data so to say that one has to finally be able to give it a true solution. (…) but critical thinking leads you to analyze that problem to finally solve it.
	P3: well, the to have a critical thinking first you have to find… or seek to ask the questions about what one wants to investigate. Collect the data, inform yourself of everything that concerns the topic you are investigating and later evaluate the data. Having a critical thought is not simply criticizing just because or because you heard that such a thing was said elsewhere, having a critical thought... or that is what I always try to do and also to tell the students to have a thought of their own through information, not because of what you heard, not because of what they told you. Collect information and process and know how to process it
	P5: process the information and then awake that curiosity and begin to question themselves
Think for oneself	**P2:** it would be a freedom for the pupils, both for them to investigate and think for themselves.
	P4: Well, in my perception, the ability of critical thinking is when a person or a human being can have the ability to express himself, to reach conclusions for himself, without depending on any other external argument. That is, without depending on religion, on what is acquired socially, it is to be able to speak for oneself, that for me would be to have a critical thinking.
	P5: critical thinking has to be for me a fundamental basis because students have to be able to understand and reason and reach an optimal result, as the subjects I have are Exact Sciences.

Figure 2. Definition of CTS - Low-SES analysis

Participants 1, 3 and 5 related the critical thinking skill with the ability to process information. Participant 1 mentioned that students first need to gather information and then analyse it critically to reach a solution. He also expressed that this skill is not only useful in his subject but also useful for real life where they need to have this problem-solving skill in order to make important choices in their lives. Similarly, participant 2 noted that students have to question themselves to seek and gather information to process

it by themselves. He said that in that way they will reach a critical thought of their own. Participant 5 also said that students have to *process information* and then through that process, they will "wake up curiosity".

Participants 2, 4 and 5 (again) linked the ability to think critically with the ability to think by oneself. This means that they reach their own conclusion by seeking an answer by themselves. They question everything and develop their own thought without any strong bias. Participant 2 used the word "freedom" to describe critical thinking skills. He said that once students develop this skill, they will be able to "think for themselves" which consequently will lead them to freedom. Similarly, participant 3 argued that critical thinking is when students develop their own argument "without depending on religion, or what is acquired socially…". Participant 5 gave a definition more related to her subject. She explained that critical thinking skill has to do with the individual ability of the student to "understand and reason and reach an optimal result". Thus, the concept of critical thinking according to the teachers from the low-SES can be described as the *ability to process information and think for oneself.*

Regarding teachers working in the high SES context, their answers were quite similar to the participants that work in the low SES. The theme identified in the patterns of their responses was that critical thinking is the ability to process information and solve problems (see figure 3). All five participants gave concise answers to illustrate their conceptualization of critical thinking. These concepts were highly similar to the ones given by the low SES participants. Thus, it is possible to answer that the teachers' conceptualization of critical thinking from both contexts is, in general, the ability to process information, think for oneself and solve problems.

Definition of CT	
Key Words / Phrases	**Supporting declarations**
Ability to process information and solve problems	**P6:** for me critical thinking is when one goes beyond acquiring a simple knowledge, being able to organize it, discard information, but it really begins when the person starts to analyze evaluate and comment on the knowledge acquired.
	P7: And critical thinking points more to functional reasoning, that is, how I apply to my life what I am learning. To be able to draw conclusions comparing, discerning, this taking charge of my decision.
	P8: It is the use of the theoretical skill you learn and how you can apply it in practice
	P9: is the ability to reason and solve problems
	P10: What do we want critical thinking for? For an ideal analysis of the subject (…) it would be ideal for them to be able to have a critical thinking, analyze questioning.

Figure 3. Definition of CTS - High-SES analysis

B. Specific Question Two: How do teachers foster critical thinking skills in the classroom?

To answer this question, participants were asked two questions, the first one was if they think that critical thinking is important and why, and the second one was directly about their practices to foster CTS in their lessons. The first question was to know how much relevance they give to critical thinking and the second question was to know if they use technology or not during their lessons to improve the learning experience and therefore enhance critical reasoning.

1. Importance of Critical Thinking Skills for teachers

The main theme was established during the coding of the transcripts, which is the "Importance of critical thinking". Within this theme, teachers gave their answers about the significance of CTS, from those answers, two subthemes were identified. They are "CTS for life" and "Social Wellbeing" (for full analysis see Appendix 8, Figure 13). Participant 1 claimed that "students do not reason simply for the subjects, but also for life". He argued that what is learned in school is also useful for life, meanwhile, participants 2, 3 and 4 argued that the ability to think critically can benefit individual decisions that also contribute positively to interpersonal relationships. Participants 1, 2, 3 and 4 also explained that it is important to have people with critical thinking skills in society to achieve meaningful change. For instance, participant 5 stated that "if we do not know how to think we will always be dominated". He was alluding to the Paraguayan socio-political context. Participant 2 mentioned that having CTS is going to cause an "awakening". Thus, they considered that CTS is relevant to improving social well-being through individuals that are capable to make useful decisions.

Similar findings were found with respect to the responses from teachers that work in the high SES private schools. The subtheme identified within the theme "importance of critical thinking" were "discerning information and decision making" (see Appendix 8, figure 14 for full analysis). Alike teachers from the low SES background, participants 6, 7, and 9 mentioned the ability to discern the true information from fake news and how this can be healthy for society. Participant 7 was mentioning how nowadays, it is important for students to analyse the lyrics of the songs to obtain a deeper artistic meaning

of music, hymns and more. Participant 10 added that through critical thinking people can compare different scenarios, things, or choices and analyse the consequences of each.

2. Teachers' Practices to Foster CTS

After the question about the importance of critical thinking skills, the participants were asked to explain how they foster CTS in their lessons. Two subthemes were identified in the theme "Teachers' practices to foster CTS" (see figure 4). The answers show that the teachers use mainly two pedagogical techniques that are encouraging curiosity through questioning or investigations, and the other one is through case studies

Teachers' practices to foster CTS	
Key concept / Word / phrase	**Supporting declarations**
Encourage curiosity and autonomy	**P1:** And I tell them "Look if you want to be good computer scientists you can't depend on what we teach in school. Today there is a powerful tool that is the internet that you know more than anyone else and you can use it to be the best in the area."
	P2: from my point of view, I believe that the teacher does not have to take all the answers to the students (...) Actually with turn papers mostly because they wonder why things are the way they are, so I try to direct towards the subject in which I am right now. It happens more in artistic education, that is, the music part, so they asked themselves that question... the one I had mentioned at the beginning, so I make them find out that, I make them look for the answers.
	P3: As I said at the beginning, they should challenge teachers with questions. Motivate their curiosity so that they do not remain silent,
	P4: It is basically, it would be to analyze an existing or fictitious case where the children can debate about that case or also give possible solutions. So, with this possible solution what is sought is... that is... with this method what is sought is that they can expand their critical reasoning, their method of thought and also to be able to debate with arguments.
Analysing practical cases:	**P1:** one poses obviously.... teaches a structure to the student that helps him to be able to give a solution to the problem posed. The student is presented with the problem and, obviously with the structure already explained that one has to follow in order to reach to a solution to the problem. Why? because that structure applies to any problem, but you have to use reasoning to know how you apply it to be able to find the solution. So, I raise the problem and tell them to solve it.
	P2: In my case I try to get them to think a little bit about the type of music they consume
	P4: we are looking for a case of for example the robbery in the neighbourhood an example. Then that issue is shared and there are two sides: one that is against and another that is in favour of these issue that involves for the gun control topic that has been discussed a lot lately. So, one is in favour of the provision of weapons and the other is not and there is an atmosphere of debate there. Then we get to a final response. So, I think that with that type of method pupils are promoting, that is, they are expanding their critical capacity or their ability to think or solve problems.
	P5: That day to day example can be speed, okay. The unity of the speed of the bus here in Paraguay. How many kilometres per hour... or if we want to pass the international system is meters per second and that. And also, what happens when it brakes, they tell me when it's going to be negative acceleration or positive acceleration, that's how I try.

Figure 4. Teachers' practices to foster CTS - Low-SES analysis

that are relevant to their context. For instance, participant 4 generate debates about different cases that happened recently in the neighbourhood. Another example is how participant 5 uses contextual cases for her physics class, such as the example of calculating the acceleration of a bus in a city in Paraguay. Thus, the responses indicate that teachers consider that CTS are important for our society, and they try to foster them through contextualized cases or problems so that they can find them meaningful. Encouraging curiosity and autonomy through practical cases and investigation seems to be the main way in which teachers from the low-SES school enhance critical thinking in their lessons.

Interestingly, the participants from the high-SES gave much more emphasis to educational technology when talking about the techniques they use to foster critical thinking (see figure 5). Participants 6, 8, 9 and 10 described that they also foster CTS using EdTech for investigation, videos, recording music, watching the news, doing presentations and more. Participant 6 expressed how she makes students investigate certain topics through the Internet to later prepare presentations on Google Slides, Canvas, or any other presentation software. Participant 8 talked about how he uses instruments and tech to have more visual aids in order to provide a better learning experience in his subject. Participant 9 mentions that uses the computers to show different pieces of news to students so that they can analyse which one is more accurate and which one is not. Participant 10 noted how she uses well-known learning platforms to motivate her students and also provide better teaching. Similar to the participants from the low SES, participants 6, 7 and 10 shared how they use debates, writing, dialogue and or even a rewarding system to engage students in their lesson and make them reason.

Contrasting the results between the two different contexts, they indicate that one of the main ways that teachers try to foster critical thinking skills independently of the context is through engaging in debates, dialogues and case studies that are contextually relevant. However, the responses of teachers from the high-SES private school suggest that technology is a useful tool when trying to enhance critical reasoning in students. In the following section, the findings regarding teachers' perceptions regarding the use of technology in the classroom as well as how it might influence CTS are discussed.

Teachers' practices to foster CTS	
Key Words / Phrases	**Supporting declarations**
Using EdTech	**P6:** the children do their own research of examples of they have. In groups they choose an example of a genetic modification that is being done and they have to decide if they believe that this modification is ethical and why or why not and then if they believe that it is a good thing for society for the world why yes or why not. Then we start generally seeing information from the internet that can be in the form of texts, it can be videos ... lately it tends to be more videos because there is a lot of information that today can be seen in the form of videos. So, we start very generally at the level of knowledge understanding the basics of the information that we are receiving in the video and that we would do with simple basic questions at a lower level of thought orders let's say.
	P6: They have to create a presentation to be able to share with the rest of the group so there they use Google Slides or Canvas, or they can use any medium they want to be true. So, they have to classify what information is important, what information it is not, we work a lot on how to make a good presentation. So having to use periods and not paragraphs or long sentences there they have to summarize the information extracting the most important of that information, looking for the photos images that can help explain that more ... and between them deciding well who is going to explain what part, understanding them that at the end of the presentation that they will later give to the class the rest of the students can ask questions then they have to have chewed the information well and they have to be able to answer those questions of whether it is ethical or if it is not ethical if it is good if it is not good
	P8: What I do always start with a small video so that I can see and then take the violin out of the case and show them while the correct posture is the violin, this is the bow, and this is the way to use. So, it creates an interest in them to be able to not only see from the teacher is playing the violin, but what I do is pass by and say… let them use
	P8: In the particular case when for example I speak about famous musicians for example I always try to see the fragments of films that were developed on that musical exponents quite well known or current musicians that are emerging, are having their presentations, then show them what to make them listen to what is a true studio presentation, and a live presentation of that; what are the things that are added perhaps or that are taken out, or the instruments that are complementing all that what happened.
	P9: Well so a quick example can be for example that they review different texts on the computer and that they identify what is fake news. Or I show you a piece of news... that is a mere one in which they analyze, why this is false, why it is true... We have to always look at the data when we look, and so on.
	P10: And I don´t know... I try to motivate, in different ways, I have an application that I use called ClassDojo that you surely know. Well, of course, I'm my way of motivating, when they give them points, they really get to certain points and I give them bonus points and things like that.
Engaging with other methods (debates, dialogue, stimulus)	**P6:** Sometimes we also do it in the form of debates we have debates like this orally in the class and also a large component of General Studies is essay writing so we also prepare them to write essays based on the topics and there also comes the whole organization of what is an essay that also requires that type of critical thinking. Now we also use texts so if we have texts, we also have to analyze the text and there comes the part of the basic questions and then reaching the levels of inference, the levels of opinion and evaluation, sources... what my sources are, to all that but everything is different.
	P7: I give you such a simple example, I am in a situation where I am teaching the boys to order their headings, the date on this side, the grade, the name, the title here, the maxim this has underlined this, and one of them on one occasion began to do wrong I grabbed the sheet and began to wrinkle, I said "stop, what's wrong with you", "I did it wrong" "well calm, it doesn't matter, if you did wrong draw a line, pay attention, compare what you had doing wrong and down there started to make your header again". Or what are you going to do in life if something goes wrong? you try to do something, it goes wrong, what are you going to do? you are going to want to go to the extreme, this is not my thing, I want to commit suicide, I do not serve, you do not have to give yourself opportunities and learn from mistakes.
	P10: Maybe with some kind of prize that is not expensive but that is something that they value and that also helps them to want. Well, I'm going to read and learn from this because I'm going to receive something because we all work like that. They give us something and we want to do, and so on if it happens.

Figure 5. Teachers' practices to foster CTS - High-SES analysis

C. Specific Question three: What is the role of technology to foster critical thinking skills according to teachers?

To answer specific question three, the participants were asked about their perception of the inclusion of digital tools in the classroom as well as how it might help

to develop CTS. Participants from both contexts presented a balanced view regarding the use of technology. Their opinions were very similar to each other and the main findings were as well. However, the teachers from the low SES context were slightly more technocentric in their answers and made stronger claims about the use of technology. Before going to the analysis of the responses, it is important to mention that during the interviews, the participants also gave important information about their context and their role as a teacher regarding digital education. Thus, before going to the main findings that answer this question, the following analysis is going to be shared because it provides an important understanding of the way teachers think about this topic.

When participants from the low SES were asked about their context they highlighted their limitations. They focused on the lack of digital equipment (see appendix 9, figure 15 for full analysis). Participant 1 gave an example of how teachers in the countryside during the pandemic had to go house by house to hand out the assignments because neither students nor teachers did not have phones, laptops or any other digital device. Participant 2 mentioned that he had to use his own equipment to utilize digital technologies in the classroom. Participant 3 explained how his classroom only has a whiteboard and markers, and participant 4 mentioned the lack of equipment in the classroom not only in the school he works for but also in most schools around the country.

Another subtheme about the context that was identified is the lack of digital literacy. Participant 1 mentioned how the lack of digital literacy not only affects students and teachers but also parents, who cannot help their children to use technology efficiently. Besides, participant 2 expressed how during the pandemic, many of his colleagues struggled to understand the different platforms for online education. Participant 3 recognized that he would like to use technology but that most of the time he does not how to use the new digital tools, so he emphasized that he as well as other colleagues needs training first, before implementing technology in the classroom. Participants 4 and 5 also stressed the need for training in educational technologies.

Regarding critical thinking and their educational contexts, participants mentioned that the educational system is not designed to foster critical thinking skills. Participant 1 mentioned how students are not motivated to think critically since children, they only follow a mechanical reasoning to solve problems or answer questions. Participant 3 expressed his displeasure with the educational system that frames the way he develops

his lessons. Due to the curriculum he has to follow, sometimes he does not have the liberty to teach using his own methodologies. Participant 4 mentioned how in many families, students are strongly influenced by what their parents say, think and believe. He mentioned that most times the student does not have the opportunity to develop an independent identity.

On the contrary, teachers from the high SES school gave more emphasis to their privileges and focused more on cultural barriers rather than their own limitations (see appendix 9, figure 16). Participants from the high SES expressed certain awareness of their privileges in their answers about their context. Unlike participants from the low SES context, they focused more on describing the digital technologies they have in their lessons. Participant 6 mentioned the different types of platforms, participant 7 directly mentioned that the school where he works is very privileged, participant 8 mentioned how he uses technology to teach music and participant 10 also describes the types of technology she uses.

Instead of mentioning their own limitations, participants expressed more cultural barriers when talking about critical thinking in their context. Participant 6 mentioned that, at a national level, the country is not progressing in terms of critical thinking. Participant 8 mentioned his own experience as a student when he had to learn music. He did not have the privilege to actually see and play the instrument, they learned about instruments through books. He also expressed that this is still the reality in many schools in the country. Participant 10 stated how the lack of interest in the individuals is one of the main barriers, in her opinion, to foster critical thinking skills. She used the term “kaigüetismo” (a Guaraní term to describe laziness) to explain the way students are nowadays. And then she also referred to the lack of technology in public and low-income private schools.

These findings suggest that teachers from the low SES contexts are more aware of the difficulties and limitations in their context, while teachers from the high SES give more emphasis to the opportunities and benefits they have to use technology and foster CTS. Teachers from the low-SES contexts are more concerned about the lack of equipment, training and curricular limitations to foster CTS. On the other hand, teachers from the high-SES context are more aware of their privileged and do not strongly emphasize barriers at an institutional level but more in the cultural realm.

Regarding the role of a teacher in a digitalized world, the participants from the low-SES gave more emphasis to educate themselves about educational technologies and also on their responsibility to foster CTS whether having technology or not (see appendix 10, figure 17). Teachers mentioned their role in regard to digitalization and fostering critical thinking skills. In both cases, participants from the missionary school held themselves accountable. They recognized that it is their responsibility to keep themselves updated in terms of educational technologies. Also, they assumed responsibility for teaching students the correct use of technology. Participant 1 and 4 expressed their responsibility as a teacher to instil in them digital literacy to later use that skill in the professional or academic area. Participant 5 referred to the need for training to keep themselves updated.

Concerning their roles in fostering critical thinking skills, they also recognized that they play a fundamental role. Participant 1 mentioned how teachers are not giving enough emphasis to this skill and therefore students are not learning to reason critically. Participant 2 said that it is the teacher's responsibility to foster CTS and participant 3 noted how he challenges his students to be demanding and question everything in his subject. Participant 4 highlighted how the teacher must be aware of the individual characteristics of each student and help them according to that.

On the contrary, participants from the high SES focused more on teaching the correct use of technology to students and their duty of keeping themselves updated on the latest educational technologies (see appendix 10, figure 18). Participant 7 mentioned that technology "is a sea, and ocean" where the children can be wrecked if they are not given the correct direction. A point that is important to remark is when he mentions that this generation, instead of being digital natives, is a "digital orphan" because they do not have mentors or responsible adults to teach them the dangers of the internet or the digital space. Thus, he explained that teachers need to be responsible for that, they need to become mentors for students to use technology appropriately. Participant 6 said that teachers need to constantly keep themselves updated with the latest technologies to offer a better learning experience and participant 9 emphasized that teachers need to continually foster their CTS as well, otherwise they would not be able "to give what they do not have".

Regarding teachers' roles in the use of technology and fostering CTS, participants from both contexts had very similar responses. These findings may indicate that teachers

are aware of the digital changes in education and the responsibilities that these changes bring. They are also aware that they play a fundamental role in the enhancement of CTS in their lessons. This different appreciation of their context and roles might or might not influence how they perceive the use of tech in the classroom and how it might or not influence critical thinking in students.

1. Perceptions of the use of tech in the classroom

Three subthemes were identified during the analysis of the responses of participants 1 to 5 regarding the topic of "Perceptions of the use of tech in the classroom". The first subtheme identified was "technology as a must" (see appendix 11, figure 19). This theme was named in that way because teachers made strong technocentric claims about the inclusion of digital technologies in the classroom. Participant 1 for example stated that "if one does not have technology is outdated". Participant 2 mentioned that it is important to invest in technology and that it is a tool that is going to help him a lot in his work. Participant 3 was mentioning how it would increase the learning experience in his classroom and then he stated that "to prohibit that [technology] would be to delay, to delay your community, your students and, in the end, your country". Participant 4 was explaining how the pandemic made teachers beware of technology and that they had in some sense to adapt to what students already had, meaning that students were already immersed in the digital world. Participant 5 said that there was a before and after in her classes when she started using technology. She explained that students learned better after including a certain online platform to do Math and Physics.

The second subtheme is "keep a balance". Teachers also gave their contrast between the new digital methodologies and the "traditional methods" to teach. They argued that it is important to have technology, but it is also important to not forget about the traditional methods of teaching. They stated that it is necessary to combine both and be able to discern when it is a good moment to use technology in a lesson or to develop it more traditionally. One of the responses also expresses that the transition to digital should be slowly so teachers from older generations can adapt to it. They were sharing their experiences through the pandemic and explained how the digitalization overnight was overwhelming and stressful for them. However, that experience led them to realize

the significance of digital technology nowadays and that it is a reality they have to embrace.

Lastly, participants expressed their worries about the lack of digital literacy not only in students but also in them. They were self-reflective about that issue and mentioned that they need training to keep updated on the use of technologies. Participants 3 and 4 noted that it is a teacher's duty to learn how to use technology in the best way possible for their lesson. That means that it is not only about knowing how to navigate through the digital space but also about being capable of choosing the best platform/software/app for their lessons. Otherwise, the use of technology in the classroom is likely to become a distractor instead of a tool.

Regarding the responses from the participants from the high SES context, they gave not such strong claims as the ones from the low SES. They gave more balanced opinions regarding the use of digital technologies in the classroom. Two subthemes could be associated with their responses regarding their thoughts on having technology in the classroom. The first one is technology as a necessary tool and the second one has to do with having a balance while using technology.

Teachers from the high SES also expressed very positive thoughts about the use of technology in the classroom (see appendix 11, figure 20). Perhaps, the only difference is that they are already talking about their experiences with its use. They mentioned that technology makes their work much easier and that it is something that cannot be avoided anymore. Participant 6 mentioned how using technology helped her to have more inclusive lessons, participant 7 said that technology is very useful as long as it is used correctly. Participant 8 explained that having all his content online makes the lessons more comfortable and participants 9 and 10 expressed that teachers have to communicate to students the way they communicate, referring to students who are born in a digitalized world already. Thus, alike participants from the low SES context, the responses indicate that technology is a necessity in the classroom.

However, teachers also mentioned the importance of having a balance. Participants 6 and 7 mentioned that despite the fact that technology plays an important role in education nowadays, it cannot replace the teacher and also it cannot replace the social interactions that happen in the classroom. Also, the effectiveness of educational technologies depends on the use that the teachers give to them, according to participant

8. Participant 10 mentioned that teachers do not have to fully depend on the digital tools because there can be scenarios where they will not be able to use them and therefore, they will have to develop their lessons in a different way. Participant 9 pointed out that educators also need to consider that not all students will learn only with technology and that other types of pedagogies are always needed.

2. Relationship between CTS and EdTech

Participants were directly asked if they think that there is any relationship between educational technologies and the development of critical thinking skills (see figure 6). Participants did not give absolute answers about technology increasing or improving the CTS but they did mention that it would contribute to the learning experience and access to resources or information which eventually could be useful for students to reason in a critical way. Participant 1 mentioned how the fusion of technology with a good teaching

Relationship between CTS and Edtech	
Key concept / Word / phrase	**Supporting declarations**
Learning Experience Support	P1: I say that it is very important the fusion between what it is to teach the class talking, showing the class on the board and showing an audio-visual material in its increases much more the experience of the student and also the learning because there are many students who will learn in that way rather than simply by listening
	P2: I think that's one of the ways to also encourage that kind of thinking in my subject so that they analyze a little bit of the music that they like.
	P3: Showing a functioning of a heart or how a red blood cell works, what function the white blood cells have to show how those microorganisms, the white blood cells, are picking up, would be spectacular, it would be something like science fiction, seeing our young people or showing them
	P4: I think yes as I mentioned a while ago, as long as it is given the correct use, I think it is part of our reality today we cannot escape from that and I think we can look for a union. As I said a while ago, seek to harmonize and if you can encourage critical thinking because I within my case study methodology, which I love, uh, I can use a platform to use technology to be able to promote that case study; using Power Point I'm using technology.
	P5: It's something new, it's innovative, and it attracts out of curiosity as well and they learn more. It captures their attention. (…) Because one awakens more curiosity with technology, with GeoGebra and Gonzo, which I use with the compass for the pupils who are year 7,8 and 9.
Expand Resources	P1: From my point of view, it is to merge a part of what we do by doing critical thinking on a sheet through the implementation of a specific problem that is put on the board. Everyone starts to comment on that and gives their opinion with a critical thinking, but then take it to technology then to be able to have more resources and increase knowledge.
	P3: Yes. Yes teacher. It's going to open you... it is going to open up to the world.
	P4: Likewise. We have for example the case of the Kahoot platform, which is a question-and-answer platform, it also has other learning options. In fact, I think it's a platform more than anything for learning. If the right questions are placed, meaningful learning can be achieved.
	P5: Yes, quite a lot. Because as the students are curious, then they do or do use technology to see more, or they also search and investigate when something is not clear for them. It awakens their interest.

Figure 6. Relationship beteween CTS and EdTech. Low-SES analysis

methodology could improve the learning experience because students will not only have oral input from the teacher but they will also be able to provide audio-visual material that might be very helpful for students who are more of visual learners than auditive ones. Participant 3 also said something similar, he explained that using technology in his subjects -Biology and Science- would be "spectacular" because the graphic and vivid image of a heart functioning or the functions of the cells, microorganisms and more, would be something that students would remember more easily. Participants 2, 4 and 5 shared that the use of tech will improve the delivery of their lessons. Participant 5 said that, according to her experience, "it [technology] captures their attention".

As mentioned before, participants also expressed that having technology in the classroom provides vast access to information for both teachers and students. They mentioned that students can use the internet to access more information, do research work and more. Thus, the answers of the participants from the low-SES school indicate that technology might not be a deterministic variable to improve CTS but it is a highly useful tool to enhance or awaken certain areas in the learning experience or students' cognitive skills that help to develop those skills.

Interestingly, participants from the high SES context also made very positive claims about the use of technology in the classroom and they were aware of the need for a balance as well (see figure 7). Then, after they gave their perceptions about the use of tech in the classroom, they responded that technology might or not influence or help critical thinking in students. Most of them agreed that is a tool that improves the learning experience or that it is a tool that fastens the lesson development, helps with inclusion and encourages participation. For example, participant 6 mentioned that with certain software, the student can share anonymous answers and only the teacher knows the name of the students who respond. She explains:

> "…everyone has to write and what the teacher can do afterwards is to show their answers, which is optional. But if you show their answers are totally anonymous, no one, only the teacher then knows who wrote what. But at the time of showing the general answers, no one knows who wrote what. So, no one is in evidence if they did not know, if they wrote nonsense, then I think that encourages them to take a few more risks and also helps them not to lose focus and helps them to make a little effort because critical thinking requires an effort."

Relationship between CTS and Edtech	
Key Words / Phrases	**Supporting declarations**
Tech as support to develop CTS	**P6:** This application is the one that helps me the most I do not know if it really makes the boys think more. I think it has nothing to do with technology but it is a tool that helps me to reach all the boys because the previous alternative, we were doing the same thing maybe with a book with a text even with a video with a TV but I could ask 2 or 3 guys and they were not going to know or they were not going to want to express their opinion for fear of saying something that they did not want others to hear or if they were not the excellent ones who were going to have everything solved but that others will be able to identify. With this, everyone has to write and what the teacher can do afterwards then is to show their answers, which is optional. But if you show their answers are totally anonymous, no one, only the teacher then knows who wrote what. But at the time of showing the general answers no one knows who wrote what. So, no one is in evidence if they did not know if they wrote a nonsense then I think that encourages them to take a few more risks and also helps them not to lose focus and helps them to make a little effort because critical thinking requires an effort and it is more difficult truth.
	P6: Yes, it is a true tool that is like... for example, I can eat with my hand I can eat with a fork the fork will help but I can still eat without the fork. So, I see it in terms of critical thinking that pupils can improve, they can get to have a faster development of certain cognitive functions but more at the level of organization classification of speed, of thought, to discard ideas in general I believe that if the technology itself forms them
	P7: Yes, it is also useful. The only thing that has to be well guided, well oriented
	P7: I look differently at a teacher who handles technology and another who does not handle technology because, although he does not handle technology, I see him as a teacher who knows but is limited. For certain concepts you will be able to teach because we have all learned it, but it will cost you a little more or it will take a little more time. However, the teacher who has knowledge about technology will be able to reach the knowledge of the children faster, will be able to advance better. Both of them are going to fulfil their objectives, but one is going to take more time and the other less time I understand
	P8: all this is technology helps a lot to music teachers at least, we record songs with them and show them what would be the points where one should be improving, either in the posture or the firmness, in what would be the constancy of time and so on and with that we are using during everything that is the technology.
	P9: Well as I told you depends a lot on how you use technology to develop critical thinking because either the technology can help you or cannot help at all. It is a tool and depends on what you use it for and how you use it can contribute a lot. It won't contribute if you don't know how to use.
	P10: Yes because you have more options also to find information. They can… or is much more available at hand let's say, it depends on the students' interests, that is what we have to awake, that interest of the student to want to know more.
Tech is not fundamental to develop CTS	**P6:** We take the concept of critical thinking as a whole. Now, if we develop it in a traditional way by word of mouth, from pencil paper or we do it through virtually with technological support, technology is not essential, it is one more channel to be able to develop what is critical thinking. Critical thinking can be taught in a traditional or technological way.
	P9: it always depends on how it is used. That is, if you use technology, it can be used only to entertain. So, if you use it only to entertain it does not serve you at all. So, you have to think it's really worth it for me to show this, to analyze or what the advantages and disadvantages are.
	P10: Everything depends a lot on you, because you can have at your disposal all the technology in the world, but you do not have the interest of investigating study analyze. I mean, I think your critical thinking is not going to develop because of all the tools you have. I may have a variety of tools but I don't know how to build a house. And yet, one that has 2 tools comes and makes me a Castle with what he has. (...) I always say it does not matter where you study but what you want to achieve in life, that already depends on each one and your critical thinking will be developed with technology or without technology.
	P10: And that's why I tell you, it depends a lot on the person or your critical thinking is going to develop with or without technology. Technology is going to help a lot obviously, but it is also what exists around you, it can also teach you many things.

Figure 7. Relationship Between CTS and EdTech. High-SES analysis

Participants 6, 7 and 9 explained that it is a very useful tool but it needs to be used correctly to be effective. Participant 8 expressed how technology allows him to record songs with his students to later analyse them critically and see where to improve. Participant 10 referred to the availability of resources that everyone has through technology. Therefore, these responses suggest that if technology is used correctly, it can become an efficient tool to foster CTS.

However, many of the participants pointed out that technology is not necessarily the only way to foster critical thinking skills. Participant 6 for instance mentions that critical thinking can be developed traditionally or technologically. Participant 7 emphasizes how the use of technology can influence the effectiveness of a lesson. Participant 10 gives an interesting analogy about a person who has a variety of tools and does nothing and on the contrary, a person who has only two tools builds an entire house. This means that it does not matter how many tools a person may have, if they do not have enough interest or guidance, the CTS is not going to be developed.

Thus, results suggest that teachers from high-SES have a slightly less technocentric view. This means they have a less strong view of the effectiveness of technology to foster CTS. Although they consider that educational technologies are very useful and necessary tools, they are not essential to develop critical thinking. Participants believe that fostering critical thinking skills depends on their approach as a teacher and the willingness of students to engage in the process of deep thinking and analysis.

C. General Question: What are the perceptions of Paraguayan teachers from different contexts about the use of technology to foster critical thinking skills in the classroom?

Despite the wide differences in contexts, similar responses were obtained from all the participants. Regarding their definition of critical thinking, they responded that it has to do with the ability to process information, critically analyse it and reach a solution. They also responded that this ability is very useful for decision-making as individuals that will consequently positively contribute to social wellbeing. It is important to not forget that these answers are highly attained in the Paraguayan context where educational institutions are not efficient or optimal. Therefore, teachers gave emphasis that CTS could help to improve the socio-political situation of the country because students would be able to make correct choices for life that will contribute to the overall well-being of their communities. That is, students will critically think to pursue a professional or academic career or to choose governors, fulfil their obligations and demand the protection of their rights and more. This, from a social justice lens -which was discussed in the literature

review as well-, is highly important for Paraguayan society, because, through critical thinking, people can question and challenge the structure of oppression and inequity.

Some interesting differences were found in their answers when they were asked about their techniques to foster critical thinking skills. Teachers from the low SES context gave different types of answers more related to using case studies or contextualized scenarios where students have to apply their knowledge. On the other hand, teachers from the high SES context mentioned the use of educational technologies when fostering critical thinking skills. They mentioned different online educational platforms, the use of smartboards, sound equipment and different digital tools. In these responses, it is possible to already notice how context influences their practices and responses regarding their practices to enhance critical thinking skills. As mentioned in the literature review, the social context influences how people perceive education. In this case, educational tools were important variables when the teachers from the high SES were sharing their practices to foster critical thinking skills. On the other hand, teachers from the low SES mentioned more traditional methods in their answers, almost completely excluding EdTech.

Lastly, they were invited to share their perceptions about the use of technology in the classroom and how it could be useful to foster critical thinking skills. Slight differences could be pointed out from the data collected. Teachers from the missionary school gave stronger and more technocentric claims when giving their opinions about the inclusion of technology in the classroom. Technology is an aspiration or a desire they have for their lessons. Contrarily, Teachers from the costly private school mentioned that technology is important but not essential in the classroom. Their responses were less technocentric and some of them mentioned that it is important to sometimes rotate the methodologies in the class. Participants from the low SES also mentioned that it is important to have a balanced concerning technology and teachers need to be able to discern when it is going to be helpful and when it is not. Teachers from the high SES context mentioned that technology is not fundamental at the moment to develop deep thinking and analysis but that it depends mostly on the student and their motivation to engage critically with certain topics. Participants from both contexts highlighted the significance of using the technologies correctly to have effective lessons. Otherwise, if teachers do not know how to use educational technologies, they will not be useful at all.

Thus, results indicate that teachers from the low SES context have a slightly more technocentric view regarding the inclusion of technology in the classroom. This means that they think that lessons are going to be much more efficient and that the learning experience is going to be better for students. On the other hand, teachers from the high-SES showed certain indifference toward the use of technology in the classroom to foster CTS. They did consider that technology is an important tool but it is not essential to provide a good learning experience to students. This different appreciation towards technology might be due to the fact that teachers from the costly private school already have all the educational technologies and know from experience that it is not a determinant factor to improve all the teaching and learning experience. On the contrary, teachers from the low SES school have less access to educational technologies and therefore they hypothesise what their lessons would be like if they had the same technologies as the other institutions. This suggests, as discussed in the literature review, that the context influences how educators perceive technology in the classroom. More in-depth analysis of the findings compared to other studies and literature as well as how this research adds to the already existing literature will be discussed in the following chapter.

CHAPTER IV

DISCUSSION

In this chapter, the findings will be contrasted with the literature review and also it will be explained how this research adds to the already existing literature. It is also going to be discussed the relevance of the context in which this study was developed. The discussions are going to be held around the research questions and findings, hence different sections for each question and their respective findings will be presented in this chapter. The specific questions were meant to lead to the answer to the general question of this research. For this reason, more emphasis is going to be placed on it to obtain a more extensive and relevant analysis. The response to the general question is intended to provide significant insights into the Paraguayan educational context.

A. Concepts About Critical Thinking

The definition of critical thinking was approached from a broader or more philosophical perspective of the term. For example, some of the definitions that were given were “the thinking that critiques” (Moore & Parker, 2021, p. 2) or “a cognitive activity that is associated with using the mind” (Cottrell, 2005, p. 1), which are very broad. Then, it was argued that critical thinking is a skill that makes us different from animals because we are capable to analyse the information, we receive to make the decision instead of being guided by our instincts (Epstein & Kernberger, 2006). These definitions were not very related to the ones given by the participants. The responses indicate that teachers view critical thinking from a more practical area. Teachers defined critical thinking from their experiences and subjects which agrees with what was mentioned in the literature review, that despite having a general definition and rubrics for critical thinking, teachers mould it according to their necessities in the classroom (Vincent-Lancrin et al., 2019).

The definitions given by the participants can be condensed as that critical thinking is the ability to critically process the information to reach a conclusion that helps the decision-making process. As mentioned in the findings section, participants from both contexts had quite similar definitions of critical thinking. Results suggest that they gave

their answer according to their own ideas and experiences. Compared to the literature previously discussed, the NACTA journal (2010) gives a very similar definition of critical thinking. This article (2010) mentions that critical thinking has to do with the ability to conceptualize, analyse, synthesize, and evaluate the information gathered to guide belief and action.

Critical thinking can be absent due to religious beliefs, emotions, fanatism and many other reasons (Cottrell, 2005; Moore & Parker, 2021). Participant 4 gave a similar answer regarding this topic. He mentioned that critical thinking is the capacity of the student to develop his/her own argument without external influences such as religion, beliefs and others. Participants 6, 7 and 9 were talking about how fake news or mainstream opinions can shape the way one thinks. They mentioned that the ability to think critically is essential for this reason so that they can carefully analyse opinions given by people with influence, such as celebrities, content creators, influencers and others. As discussed in the literature review, critical thinking is essential in an overcommunicated world to discern what is true or not (Epstein & Kernberger, 2006).

Overall, most participants answered that critical thinking is fundamental for individuals' lives and social well-being. In the literature review, it was discussed that correct thinking leads the person toward choices that will allow them to participate meaningfully in their communities (Soloff, 1989). Another way to phrase this is that people use CTS to reach conclusions to make choices that are optimal for their lives and hence their community (Moore & Parker, 2021). From a social justice perspective, these conceptions are very interesting given the fact that critical thinking skills allow people to notice unjust structures within society, which was also discussed in the theoretical framework (Aagaard, 2021; Vincent-Lancrin et al., 2019). Besides, it also allows people to make better choices for their lives and in this way eventually improve their lives quality (Saito, 2003; Zheng & Stahl, 2011). Thus, results suggest that Paraguayan teachers from low and high-SES contexts conceptualize critical thinking in a practical realm, avoiding philosophical or broad definitions. They also consider that CTS are important for a society's awakening and well-being, which aligns with the use of critical thinking through a social justice lens. It is possible to say the definitions and concepts harmonize with the ones mentioned in the existing literature.

B. Fostering Critical Thinking Skills

Fostering critical thinking skills is becoming one of the main objectives for the educational system in different countries because societies seek personal and professional development in their citizens to become active agents of democratic society (Erikson & Erikson, 2019). This means that education is no longer only input from the teachers but also teaches students how to analyse that input and question it, otherwise, students are not truly learning (Peters, 2008). Thus, educators are responsible for seeking methods and techniques to awaken curiosity and reasoning in students. (Mason, 2008). Teachers need to be aware of the importance of critical thinking and look for ways to stimulate it (Vincent-Lancrin et al., 2019).

According to the results, teachers were aware of the importance of this skill and they invested significant time to foster it. All participants mentioned how they used case studies, contextualized practical problems, debates, dialogues and research to develop CTS. To develop all these activities, they had to generate an inclusive atmosphere in the classroom (Molnar-Main, 2017). Using these strategies might help students to develop deep reasoning. However, many of the participants from both contexts also perceived how an important group of students are very motivated to engage in their lessons while others do not show interest at all. To deal with this situation, many of them mentioned different methods. Interestingly, teachers from the high SES give a significant emphasis on the use of technology to generate a more inclusive environment in the classroom while teachers from the low SES expressed a desire to have the technology to provide a better learning experience and make more engaging lessons. This being said, it is important to remember that it was already discussed in the literature review how the correct use of technology has been shown to provide a better environment to enhance critical thinking in the classroom, according to different studies (Daud & Husin, 2004; McMahon, 2009; Shkvyr et al., 2020).

Nevertheless, teachers are also remarked that they are responsible for students' well-being in the classroom and they should do everything possible to help them to achieve the ability to think critically. Many participants mentioned that critical thinking is essential to be autonomous in society, or as was mentioned in previous literature, it is a skill that empowers students (Erikson & Erikson, 2019). Participant 3 mentioned how he insisted on students questioning everything, even what he was teaching. According to

him, in this way, students would develop a more critical reflection on the information they perceive daily. And according to cited literature, having this critical skill of self-reflection and analysis helps students' personal development (Vincent-Lancrin et al., 2019).

C. Fostering critical thinking through technology

All participants mentioned that technology if used correctly, *can* be a useful tool in the classroom to improve the learning experience. As consequence, improving the learning experience will provide a better environment for students to develop their critical thinking skills (Daud & Husin, 2004; Le, 2019; McMahon, 2009; Shkvyr et al., 2020). Participants 6 and 9 mentioned that teachers should adapt to how students are currently learning. This is interesting because it can be seen how technology is shaping certain educational practices and views in schools (Crook, 2015; Knox et al., 2020). As mentioned by existing literature, digital competence is a reality and students need to learn the use of technology in the classroom (Ovcharuk et al., 2020). All participants also expressed this in their answers. Many of them mentioned how the pandemic accelerated the process of digital literacy in which some of them had to acquire digital skills overnight. Another interesting finding was that teachers, especially from the high SES, mentioned that nowadays CTS are important because of the fake news and misinformation that exists on the internet. They explained that students critically need to analyse the context to which they are exposed. In the low SES context they expressed that it would be much easier to engage with CTS if they had more technology available in the classroom, which indicates that according to them, EdTech could be a great support to foster critical thinking.

As mentioned before, all participants shared that despite technology can be an important tool in the classroom depending on the competence of the teachers, that means having the wisdom to know when, where and how to use technology with students (Ovcharuk et al., 2020). One answer that is worth highlighting is the one given by participant 7, he said that it is talked a lot about the digital generation, but nobody realizes that this is a generation that is "digitally orphaned". He was mentioning this as he was explaining how technology can be an excellent tool but also it can be dangerous. As discussed earlier, there is a new generation that is constantly learning informally and

teachers need to be aware of this (Selwyn, 2013). Participant 7 mentioned that critical thinking is not only for subjects but also for life, and he referred again to the correct use of digital space, especially the Internet. Thus this study has shown the increasing importance of critical thinking skills to support young people in navigating the use of technology. Critical thinking skills are not just developed through the use of technology but they are increasingly important for the use of technology.

Overall, positive and balanced answers were obtained from the participants, they did not have absolute thoughts or opinions regarding how technology can improve CTS. They were very critical and considered different variables that were already mentioned in this section. Certain differences were noted in the findings in the different contexts, but these are going to be fully and deeply analysed in the next section, which is related to the general question of this research.

D. Teachers' perceptions about technology in the Paraguayan context

As the literature review has demonstrated, context plays a fundamental role in the educational area. The context influences schools' organization, curricula and policies as well as students' value of education (Hallinger & Murphy, 1986; Hofman et al., 2001). It can also influence students' outcomes and achievements and even cognitive skills (Bosakova et al., 2020; Hoffmann & Ramirez, 2018; Hofman et al., 2001). Hallinger and Murphy (1986) also explained that context has a strong influence on teachers' and students' beliefs, preferences and expectations. These are a few examples in the existing literature that shows how context plays an essential role in educational practices.

Analysing two opposite contexts in Paraguay provided an insightful view of teachers' perceptions of the use and technology in the classroom and how it can influence CTS. The findings show that when teachers were asked about their techniques to foster critical thinking, the participants from the low-SES context mentioned different dynamics in the classroom. These dynamics encompassed debates, case studies, contextualized problems and more, and they barely mentioned the use of technologies. On the other hand, participants from the high-SES context mentioned their practices based on educational technologies. This indicates the digital divide in Paraguay and how it resonates with Macgilchirst (2021) when she mentioned that EdTech only benefits those who have access to it. This may suggest that the digital gap is more likely to be increasing instead

of narrowing. While the high SES makes the most of digital tools, people from disadvantaged socioeconomic status have to deal with what they can access (Macgilchrist, 2021). This means that while technology is a tangible reality for some, it is a distant aspiration for others.

As mentioned in the literature review, the pandemic exhibited a lack of digitalization and digital literacy in Paraguay (Caballero et al., 2020; V. Canese et al., 2021). These necessities were mainly spotted in low-SES contexts in Paraguay (Canese Caballero, 2020; Mereles & Canese, 2020). Similarly, participants from the low-SES context expressed their struggle during the pandemic while participants from the high-SES barely mentioned it. This suggests that educational institutions from low-SES contexts are at disadvantage in terms of equipment, training and digital literacy. This complicates the view of education as a means to help students to become autonomous citizens in Paraguayan society. It also complicates the improvement of the learning experience and consequently the development of CTS. It seems that only a selected group, that can afford elite private education, has the opportunity to enjoy the educational technologies to their fullest. Thus, it is a national educational challenge at the pragmatic and policy level to reduce the digital divide and offer the same access to resources to all students, because, as discussed before, only 11% of all students in Paraguay study in a private institution (MEC, 2018; REDEM, 2018).

One of the most interesting findings comparing both contexts was the views of teachers on the inclusion of technology in the classroom. Teachers from the low-SES context showed more technocentric views, meaning that they were more determinant in their answers. They expressed that technology is essential to improve the learning experience and foster critical thinking. Expressions like “not having technology mean to be outdated”, “students learn better with technology”, “it going to be spectacular to have the technology” and others were obtained from their answers. In other words, teachers from this context had a more aspirational view of the use of technology. On the opposite side, teachers from the high SES school were more critical of the influence of technology on critical thinking. Despite they recognized that technology helps a lot, they mention that it is only a tool and there are other ways in which fostering critical thinking can be done.

This contrast between the two contexts results interesting because here is where context plays an important role. The finding suggests that teachers from the high-SES school have a lower appreciation of technology while the ones from the low-SES school see technology as an essential tool for their classes. This might indicate that teachers that count on technological and digital equipment are less optimistic and sceptical about it. It could be for different reasons such as teachers and students being used to it or perhaps seeing that overexposure to digital tools affects students' engagement. Contrarily, teachers who do not have these technologies in the classroom seem more interested and eager to include technology in their lessons.

Although these findings are limited, they provide an initial panorama of teachers' appreciation of technology in different contexts. They also give an insight into teachers' knowledge of critical thinking and practices to foster it. More research is needed to obtain more extent and conclusive data. This is going to be discussed in the following section.

E. Limitations for Practice

Further research is needed to extend these initial findings. This research focused on the perceptions of a limited number of teachers from different contexts due to time constraints. Different research to study the perceptions of teachers in public schools in Paraguayan schools compared to private ones would be useful to have a wider and more concrete panorama of teachers' appreciation of technology. Regarding critical thinking, it would be interesting to try to measure students' critical thinking skills in each context, to see how context influences this ability. Observations could be done to analyse the teachers' practices to foster CTS in their lessons and how they engage with technology. Students could also be interviewed or surveyed to share their opinions on educational technology and how it might help them to learn better.

However, despite the limited findings through this case study research, it does provide important academic literature for the Paraguayan educational context. It is important to remark again that Paraguay is an understudied society due to the lack of investment in research from the government and little or no international relevance for research centres to conduct studies in this context. This research can become a starting point for future Paraguayan or international researchers that might be interested in the same or similar topic.

Continuing this research in the following years can also be an option to extend the understanding of the topic and include more variables as well as proceed to elaborate a data triangulation to obtain more precise results and findings. Nonetheless, this study has widely answered the research questions and the model used is easy to replicate for short-term research. However, it is recommended that similar studies can be done over a longer period of time where data triangulation can be obtained to develop a richer data collection and analysis for broader findings.

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CONCLUSION

This research aimed to answer a general question through three specific ones. The main question was regarding teachers' perceptions about the use of technology in the classroom and how they think it influences critical thinking in different contexts. This is a compound general question whose main focus is the perceptions about educational technologies and how it varies according to the teacher's workplace. The variable of critical thinking was added to understand the practices that teachers did in the classroom and how technology was related to them. Thus, three specific questions were first answered to reach the final and most important answer of the research.

A descriptive case study was used to conduct this research and a qualitative approach was used to gather data. Due to time constraints, it was not possible to do data triangulation and the findings were based only on qualitative data obtained from online interviews. This instrument to gather data was chosen because it was the most accurate and feasible one to obtain the information needed to answer the research questions. Deductive thematic analysis was done after having the transcripts, and different themes were identified, which consequently were re-analysed to obtain subthemes for more precise results.

The first specific question was "What are teachers' conceptualizations of critical thinking?". To answer this question, participants went through a series of questions to obtain as much information as possible regarding this topic. Teachers were also asked directly to give their definitions of critical thinking. The analysis of the responses and findings indicate that a good definition of critical thinking based on teachers' concepts would be "the ability to process and analyse information to reach a conclusion that will eventually help in the decision-making process". This definition englobes what participants answered. They gave answers that relate to the ability to analyse information critically, the ability to solve problems and the ability to make accurate and good decisions for one's life. Besides, teachers mentioned the importance of critical thinking for a better democratic society. From a social justice perspective, this is an interesting finding because critical thinking could help Paraguayan citizens to be aware of the unjust structures and change them for good, thus improving the overall well-being of society.

The second specific question was “How do teachers foster critical thinking skills in the classroom?”. Participants gave a variety of techniques, pedagogies and methods they use to foster critical thinking. Participants from the low SES used more group dynamics such as debates, case studies, research, presentations and contextualized problems while teachers from the high SES gave more emphasis to the use of EdTech to analyse information and engage in participation. In this finding, it was already possible to see how the context might have influenced their answers.

The third specific question was “What is the role of technology to foster critical thinking skills according to teachers?”. The findings suggest that teachers consider that technology is a useful tool to improve the teaching and learning experience which consequently will generate an ideal environment to engage with critical thinking. Participants emphasized having a balance and discerning when to use technology in the classroom. Also, they remarked on the importance of giving proper use to technology in the classroom otherwise it can become a distractor or can be very inefficient. It is important to highlight that teachers from the low-SES context showed more optimism about the potential of technology. They approached the question from a more aspirational and slightly technocentric point of view.

By analysing these answers, the general question “What are the perceptions of Paraguayan teachers from different contexts about the use of technology to foster critical thinking skills in the classroom?” could be answered. The analysis indicates that teachers from low SES context have a more technocentric view of technology as a tool to enhance critical thinking, while teachers from high SES had a more neutral view of technology. They mentioned that technology is not essential or a necessity to be able to enhance critical thinking in students. Thus, the findings suggest that context plays a role in teachers’ perspectives regarding the use of technology to foster critical thinking skills.

Different limitations were present during the development of this research. The main one might have been time. This research was done for an MSc programme at the University of Oxford that only lasted 10 months. This and more limitations appeared during the conduction of this study (see limitations section). Further research is needed to obtain a deeper understanding of this topic. Even though findings are limited, this study provides an initial panorama with useful insights into the educational context of Paraguay in relation to digital changes. It could be said that along with technological development,

it is important to foster digital literacy in teachers and educational staff from low-SES schools. These two areas need to be considered in policy and educational practices so everyone involved in the educational field can make the most of digital tools and new technologies. Thus, disadvantaged students will have the opportunity to approach the digital world in a critical and balanced way.

BIBLIOGRAPHY

Aagaard, J. (2021). Taming unruly beings: students, discipline and educational technology. *Technology, Pedagogy and Education*. https://doi.org/10.1080/1475939X.2021.1981993

Agencia de Información Paraguay. (2018, January 16). *Evaluación educativa refleja diferencias entre el sector público y privado*. Evaluación Educativa Refleja Diferencias Entre El Sector Público y Privado. https://www.ip.gov.py/ip/evaluacion-refleja-diferencias-sector-publico-privado/

Ariawan, S., & Malang, S. (2020). Building Critical Thinking in Covid-19 Pandemic Era: Impossible or I am Possible? *International Research Journal on Advanced Science Hub*, 127–130. www.rspsciencehub.com

AssessmentDay. (2021). *Watson Glaser Critical Thinking Appraisal | AssessmentDay*. https://www.assessmentday.co.uk/watson-glaser-critical-thinking.htm

Avgerou, C. (2010). Discourses on ICT and Development. *Annenberg School for Communication & Journalism*, *6*(3), 1–18. http://www.ictd2009.org/documents/

Biesta, G. (2013). Responsive or responsible? Democratic education for the global networked society. *Policy Futures in Education*, *11*(6), 733–744. https://doi.org/10.2304/pfie.2013.11.6.733

Bosakova, L., Madarasova Geckova, A., van Dijk, J. P., & Reijneveld, S. A. (2020). School is (not) calling: the associations of gender, family affluence, disruptions in the social context and learning difficulties with school satisfaction among adolescents in Slovakia. *International Journal of Public Health*, *65*(8), 1413–1421. https://doi.org/10.1007/s00038-020-01474-4

Bourke, B. (2014). Positionality: Reflecting on the Research Process. In *The Qualitative Report* (Vol. 19). http://www.nova.edu/ssss/QR/QR19/bourke18.pdf

Brown, P., & James, D. (2020). Educational expansion, poverty reduction and social mobility: Reframing the debate. *International Journal of Educational Research*, *100*. https://doi.org/10.1016/j.ijer.2020.101537

Caballero, V. C., Aquino Mereles, J. I., & Amarilla, J. (2020). *Educación Y Pandemia: Perspectivas Docentes Ante La Continuidad Del Proceso Educativo En Paraguay*. https://aprendizaje.mec.edu.py/aprendizaje/

Canese, M. (2017, November 22). El Pensamiento Crítico en la Formación Profesional Universitaria: Controversias y Perspectivas en el Contexto de la Educación Superior de Paraguay. *XVII Coloquio Internacional de Gestión Universitaria 2017*.

Canese, M. (2020). *Pensamiento crítico y estrategias de enseñanza-aprendizaje mediadas por las TIC en la formación profesional universitaria*. *1*(1). https://creativecommons.org/licenses/by/4.0/deed.es

Canese Caballero, V. (2020). La creciente importancia de la Educación a Distancia y las TIC en. *Revista Paraguaya de Educación a Distancia*, *1*(2).

Canese, V., Páez, R., Amarilla, J., & Rodríguez, P. (2021). Análisis Factorial sobre el Uso de las TIC en Instituciones Educativas de Paraguay. In *Innovaciones docentes en tiempos de pandemia. Actas del VI Congreso Internacional sobre aprendizaje, innovación y cooperación, CINAIC 2021* (pp. 170–174). Universidad de Zaragoza. https://doi.org/10.26754/uz.978-84-18321-17-7

Carter, A. G., Creedy, D. K., & Sidebotham, M. (2018). Measuring critical thinking in pre-registration midwifery students: A multi-method approach. *Nurse Education Today*, *61*, 169–174. https://doi.org/10.1016/j.nedt.2017.11.026

CES Chair of Education Systems. (2022). Factbook Education System: Paraguay Report. In *2022*. https://doi.org/10.3929/ethz-b-000541307

Cho, J. Y., & Lee, E. H. (2014). Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *Qualitative Report*, *32*. https://doi.org/10.46743/2160-3715/2014.1028

Christopoulos, A., & Sprangers, P. (2021). Integration of educational technology during the Covid-19 pandemic: An analysis of teacher and student receptions. *Cogent Education*, *8*(1). https://doi.org/10.1080/2331186X.2021.1964690

Coghlan, D., & Brydon-Miller, M. (2014). The SAGE Encyclopedia of Action Research. In *The SAGE Encyclopedia of Action Research*. SAGE Publications Ltd. https://doi.org/10.4135/9781446294406

COPROFAM. (2020, February 27). *El sistema educativo de Paraguay está entre los peores del mundo – COPROFAM*. https://coprofam.org/2020/02/27/el-sistema-educativo-de-paraguay-esta-entre-los-peores-del-mundo/

Cottrell, Stella. (2005). *Critical thinking skills : developing effective analysis and argument*. Palgrave Macmillan.

Creswell, J. W., & David Creswell, J. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*.

Crook, C. (2015). The Field of Digital Technology Research. In S. Price, C. Jewitt, & B. Brown (Eds.), *The SAGE Handbook of Digital Technology Research* (pp. 26–40). SAGE Publications Inc. https://doi.org/10.4135/9781446282229

Daud, N. M., & Husin, Z. (2004). Developing Critical Thinking skills in computer-aided extended reading classes. *British Journal of Educational Technology*, *35*(4), 477–487.

Davies, M. (2013). Critical thinking and the disciplines reconsidered. *Higher Education Research and Development*, *32*(4), 529–544. https://doi.org/10.1080/07294360.2012.697878

Denzin, N. K., & Lincoln, Y. S. (2018). *The SAGE handbook of qualitative research* (pp. 108–150). SAGE.

Doddington, C. (2007). Critical thinking as a source of respect for persons: A critique. *Educational Philosophy and Theory*, *39*(4), 449–459. https://doi.org/10.1111/j.1469-5812.2007.00350.x

Dron, J. (2021). Educational technology: what it is and how it works. *AI and Society*. https://doi.org/10.1007/s00146-021-01195-z

Dubey Mishra, R., & Jovitarasundram, &. (2017). Triangulation an Essential Tool to enhance the validity of a case study. *Scholarly Research Journal for Interdisciplinary Studies*, *4*(31), 69–74. www.srjis.com

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. In *Source: The Academy of Management Review* (Vol. 14, Issue 4). https://www.jstor.org/stable/258557

Epstein, R. L., & Kernberger, Carolyn. (2006). *Critical thinking*. Thomson/Wadsworth.

Erikson, M. G., & Erikson, M. (2019). Learning outcomes and critical thinking–good intentions in conflict. *Studies in Higher Education*, *44*(12), 2293–2303. https://doi.org/10.1080/03075079.2018.1486813

Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, *26*(2), 43–71. https://doi.org/10.1002/piq.21143

Facer, K. (2013). The problem of the future and the possibilities of the present in education research. *International Journal of Educational Research*, *61*, 135–143. https://doi.org/10.1016/j.ijer.2013.03.001

Facer, K., & Selwyn, N. (2021). *Digital technology and the futures of education-towards "non-stupid" optimism*.

Facione, P. (1990). *The California Critical Thinking Skills Test: College Level. Experimental Validation and Content Validity*. https://www.researchgate.net/publication/268295703

Fang, M. L., Canham, S. L., Battersby, L., Sixsmith, J., Wada, M., & Sixsmith, A. (2019). Exploring Privilege in the Digital Divide: Implications for Theory, Policy, and Practice. *Gerontologist*, *59*(1), E1–E15. https://doi.org/10.1093/geront/gny037

Freire, P., & Ramos, M. B. (2017). *Pedagogy of the oppressed*. Penguin Books.

Fullan, M. (2016). The Meaning of Educational Change. In *The NEW Meaning of Educational Change* (pp. 18–38). https://www.ebsco.com/terms-of-use

Galeitzke, M., Orth, R., & Kohl, H. (2019). Sustainability Strategies in German Small and Medium-Sized Companies. *Journal of Sustainability Research*. https://doi.org/10.20900/jsr20190015

Gelerstein, D., Río, R. del, Nussbaum, M., Chiuminatto, P., & López, X. (2016). Designing and implementing a test for measuring critical thinking in primary school. *Thinking Skills and Creativity*, *20*, 40–49. https://doi.org/10.1016/j.tsc.2016.02.002

George, A. L., & Bennett, A. (2007). Case Studies and Theory Development in the Social Sciences. *Journal of Macromarketing*, *27*(3), 320–323. https://doi.org/10.1177/0276146707305480

Gustafsson, J. (2017). *Single case studies vs. multiple case studies: A comparative study*.

Hallinger, P., & Murphy, J. F. (1986). The Social Context of Effective Schools. *American Journal of Education*. http://www.journals.uchicago.edu/t-and-c

Harasim, L. (2017a). Behaviorist Learning Theory. In *Learning Theory and Online Technologies* (pp. 32–47). Taylor & Francis Group. http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=4865772.

Harasim, L. (2017b). Constructivist Learning Theory. In *Learning Theory and Online Technologies* (pp. 61–79). Taylor & Francis Group. http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=4865772.

Hoffmann, M. M., & Ramirez, A. Y. F. (2018). Students' Attitudes Toward Teacher Use of Technology in Classrooms. *21st Century Learning & Multicultural Education Students'*, 51–57.

Hofman, R. H., Hofman, W. H. A., & Guldemond, H. (2001). Social context effects on pupils' perception of school. *Learning and Instruction*, *11*, 171–194. www.elsevier.com/locate/learninstruc

James, N., & Busher, H. (2011). Online Interviewing. In *Online Interviewing*. SAGE Publications Ltd. https://doi.org/10.4135/9780857024503

Knox, J., Williamson, B., & Bayne, S. (2020). Machine behaviourism: future visions of 'learnification' and 'datafication' across humans and digital technologies. *Learning, Media and Technology*, *45*(1), 31–45. https://doi.org/10.1080/17439884.2019.1623251

Kwak, D. (2007). Re-conceptualizing critical thinking for moral education in culturally plural societies. *Educational Philosophy and Theory*, *39*(4), 460–470. https://doi.org/10.1111/j.1469-5812.2007.00353.x

Le, N. T. (2019). How Do Technology-Enhanced Learning Tools Support Critical Thinking? In *Frontiers in Education* (Vol. 4). Frontiers Media S.A. https://doi.org/10.3389/feduc.2019.00126

Lei, J., & Morrow, B. (2010). Teachers' adoption of technology innovation into pedagogical practices. *Education and Information Technologies*, *15*(3), 143–153. https://doi.org/10.1007/s10639-009-9101-4

Lourenço, O. M. (2016). Developmental stages, Piagetian stages in particular: A critical review. *New Ideas in Psychology*, *40*, 123–137. https://doi.org/10.1016/j.newideapsych.2015.08.002

Macgilchrist, F. (2021). What is 'critical' in critical studies of edtech? Three responses. In *Learning, Media and Technology* (Vol. 46, Issue 3, pp. 243–249). Routledge. https://doi.org/10.1080/17439884.2021.1958843

Mansell, R. (2017). Inequality and digitally mediated communication: Divides, contradictions and consequences. *Javnost*, *24*(2), 146–161. https://doi.org/10.1080/13183222.2017.1287966

Marczak, L. (2019, January 24). *Using technology to teach critical thinking skills — Digital Learning Collaborative*. Using Technology to Teach Critical Thinking Skills. https://www.digitallearningcollab.com/blog/2019/1/16/using-technology-to-teach-critical-thinking-skills

Mason, M. (2008). Critical Thinking and Learning. In *Critical thinking and learning* (1st ed., pp. 1–11). John Wiley & Sons, Incorporated. http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=437531.

May, T. (2011). Interviewing: methods and process. In *Social research: Issues, methods and process* (pp. 131–160). McGraw-Hill Education.

McMahon, G. (2009). Critical Thinking and ICT Integration in a Western Australian Secondary School. *Journal of Educational Technology & Society*, *12*(4), 269–281. https://doi.org/10.2307/jeductechsoci.12.4.269

MEC. (2018). *Ministerio de Educación y Ciencias - Paraguay*. Matrícula 2018. https://datos.mec.gov.py/app/grafico_matriculaciones_2018

Mereles, J. I., & Canese, V. (2020). Acceso A Las TIC De Los Principales Actores Educativos en Paraguay en tiempos de pandemia. *La Saeta Universiaria*, *9*(2). http://orcid.org/0000-0001-7727-8500http://orcid.org/

Mfinanga, F. A., Mrosso, R. M., & Bishibura, S. (2019). Comparing Case Study and Grounded Theory as Qualitative Research Approaches. *International Journal of Latest Research in Humanities and Social Science (IJLRHSS*, *2*(5), 51–56. www.ijlrhss.com

Molnar-Main, S. (2017). Why Teach Deliberation? In *Deliberation in the Classroom: Fostering Critical Thinking, Community, and Citizenship in Schools* (2017th ed., pp. 17–24). http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=5116722.

Moore, B. N., & Parker, R. (Richard B.). (2021). *Critical thinking* (13th ed.).

Murillo, F. J., Martínez-Garrido, C., & Graña, R. (2020). Escuelas públicas para pobres, escuelas privadas para ricos: relación entre educación privada y segregación escolar de carácter socio-económico en América Latina. *RUNAE*, *5*, 11–22.

NACTA. (2010). What Is Critical Thinking? *NACTA Journal*, *54*(4), 70–71. https://doi.org/10.2307/nactajournal.54.4.70

Ovcharuk, O., Ivaniuk, I., Soroko, N., Gritsenchuk, O., & Kravchyna, O. (2020). The use of digital learning tools in the teachers' professional activities to ensure sustainable development and democratization of education in European countries. *E3S Web of Conferences*, *166*. https://doi.org/10.1051/e3sconf/202016610019

Pearson. (2021). *Watson Glaser Critical Thinking Appraisal*. https://www.talentlens.com/uk/recruitment/assessments/watson-glaser-critical-thinking-appraisal.html

Pereyra, A. (2008). *La fragmentación de la oferta educativa: la educación pública vs. la educación privada*. www.iipe-buenosaires.org.ar

Peters, M. A. (2008). Kinds of Thinking, Styles of Reasoning Introduction: Why the Present Emphasis on Thinking? In M. Mason & J. & S. Wiley (Eds.), *Critical Thinking and Learning* (1st ed., pp. 12–24). John Wiley & Sons. http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=437531.

Piaget, J. (1928). *Judgement and Reasoning in the Child*.

Piaget, J. (2003). Cognitive Development in children: Piaget. *Journal of Research in Science Teaching*, *40*(SUPPL.), 8–18. https://doi.org/10.1002/tea.10090

Pintos, L. (2017, July 17). *La Nación. Educación de élite en Paraguay*. Educación de Elite En Paraguay. https://www.lanacion.com.py/pais_edicion_impresa/2017/07/17/educacion-de-elite-en-paraguay/

Rafalow, M. H., & Puckett, C. (2022). Sorting Machines: Digital Technology and Categorical Inequality in Education. *Educational Researcher*, 0013189X2110708. https://doi.org/10.3102/0013189X211070812

REDEM. (2018). *Paraguay*. Paraguay - Red Educativa Mundial. https://www.redem.org/america-del-sur/paraguay/

Robson, C., & McCartan, K. (2016). Interviews and focus groups. In *Real world research: a resource for users of social research methods in applied settings* (4th ed., pp. 284–306).

Saito, M. (2003). Amartya Sen's Capability Approach to Education: A Critical Exploration. *Journal of Philosophy of Education, 37*(1), 18–33.

Säljö, R. (2010). Digital tools and challenges to institutional traditions of learning: Technologies, social memory and the performative nature of learning. *Journal of Computer Assisted Learning*, *26*(1), 53–64. https://doi.org/10.1111/j.1365-2729.2009.00341.x

Schneider, S., Beege, M., Nebel, S., Schnaubert, L., & Rey, G. D. (2022). The Cognitive-Affective-Social Theory of Learning in Digital Environments (CASTLE). In *Educational Psychology Review* (Vol. 34, Issue 1). Springer. https://doi.org/10.1007/s10648-021-09626-5

Selwyn, N. (2013). The 'new' connectivities of digital education. In M. Apple, S. Ball, & L. Gandin (Eds.), *The Routledge International Handbook of Innovation Education* (pp. 90–98). Routledge. https://doi.org/10.4324/9780203387146

Selwyn, N. (2016). Making Education More Commercial? *Is Technology Good for Education?* Polity Press. http://ebookcentral.proquest.com/lib/oxford/detail.action?docID=4547494.

Selwyn, N. (2019). What's the problem with learning analytics? *Journal of Learning Analytics, 6*(3), 11–19. https://doi.org/10.18608/jla.2019.63.3

Shkvyr, O., Haidamashko Iryna, & Tafintseva, S. (2020). Developing Critical Thinking in Younger Pupils Using ICT. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience, 11*(2), 230–242. https://doi.org/10.18662/brain/11.2/85

Skinner, B. F. (1975). How students learn. In *The Science of Learning and the Art of Teaching* (pp. 27–39). Institute for Research and Development in Post-Compulsory Education, University of Lancaster.

Soloff, sheila B. (1989). *The development of critical thinking in an elementary school population*.

Starman, A. B. (2013). The case study as a type of qualitative research. *Journal of Contemporary Educational Studies*, 28–43. https://www.researchgate.net/publication/265682891

Stimson, J., & Labelle, T. J. (1971). The Organizational Climate of Paraguayan Elementary Schools Rural-Urban Differentiations. *Education and Urban Society*, 333–349.

Teegavarapu, S., Summers, J. D., & Mocko, G. M. (2008, August). Case Study Method for Design Research: A Justification. *Proceedings of the ASME 2008 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*. http://asmedigitalcollection.asme.org/IDETC-CIE/proceedings-pdf/IDETC-CIE2008/43284/495/4577986/495_1.pdf

Temple, B., & Young, A. (2004). Qualitative Research and Translation Dilemmas. *Qualitative Research*, *4*(2), 161–178. https://doi.org/10.1177/1468794104044430

Tikly, L., & Barrett, A. M. (2011). Social justice, capabilities and the quality of education in low income countries. *International Journal of Educational Development*, *31*(1), 3–14. https://doi.org/10.1016/j.ijedudev.2010.06.001

Tuomi, I. (2018). The Impact of Artificial Intelligence on Learning, Teaching, and Education Policies for the future. *JRC Science for Policy Report*. https://doi.org/10.2760/12297

University of Oxford. (2022). *Research integrity and ethics policy | Research Support*. Research Support. https://researchsupport.admin.ox.ac.uk/governance/integrity/policy

van den Beemt, A., & Diepstraten, I. (2016). Teacher perspectives on ICT: A learning ecology approach. *Computers and Education*, *92–93*, 161–170. https://doi.org/10.1016/j.compedu.2015.10.017

van der Zanden, P. J. A. C., Denessen, E., Cillessen, A. H. N., & Meijer, P. C. (2020). Fostering critical thinking skills in secondary education to prepare students for university: teacher perceptions and practices. *Research in Post-Compulsory Education*, *25*(4), 394–419. https://doi.org/10.1080/13596748.2020.1846313

van Gelder, T. (2001). *How to Improve Critical Thinking Using Educational Technology*.

Vincent-Lancrin, S., González-Sancho, C., Bouckaert, M., de Luca, F., Fernández-Barrerra, M., Jacotin, G., Urgel, J., & Vidal, Q. (2019). *Fostering Students' Creativity and Critical Thinking*. OECD. https://doi.org/10.1787/62212c37-en

Waitford, G. (2001). Interviews. In *Doing Qualitative Educational Research* (pp. 81–97). Bloomsbury Publishing Plc.

Walsh, C. M., & Seldomridge, L. A. (2006). Measuring Critical Thinking in Graduate Education: What do we know? *Nurse Educator*, *31*(3), 132–137.

Watson, G., & Glaser, E. M. (1965). Watson-Glaser Critical Thinking Appraisal by Goodwin Watson, Edward M. Glaser. *Journal of Educational Measurement*, *2*(2), 254–256.

Willingham, D. T. (2008). Critical Thinking: Why Is It So Hard to Teach? *Arts Education Policy Review*, *109*(4), 21–32. https://doi.org/10.3200/AEPR.109.4.21-32

Wulandari, R., Baedhowi, & Hindrayani, A. (2021). Measuring Critical Thinking Skills with the RED Model. *IOP Conference Series: Earth and Environmental Science*, *1808*(1). https://doi.org/10.1088/1742-6596/1808/1/012030

Yagci, T. (2014). Mobile Social Media Challenges Digital Natives in EFL Learning. *Journal of Educational and Instructional Studies in the World*, *4*(4), 49–53. http://www.wjeis.org/FileUpload/ds217232/File/08b.yagci.pdf

Yin, R. K. (2002). *Case Study Research Design and Methods, Third Edition, Applied Social Research Methods Series* (3rd ed., Vol. 5). SAGE Publications.

Zheng, Y., & Stahl, B. C. (2011). Technology, capabilities and critical perspectives: What can critical theory contribute to Sen's capability approach? *Ethics and Information Technology*, *13*(2), 69–80. https://doi.org/10.1007/s10676-011-9264-8

APPENDIX

Appendix 1. Questions guide for interviews

1. Experiencia como profesor (como inició en la docencia, años de experiencia, etc.)
2. Como profesor, ¿cómo definirías el pensamiento crítico?
3. En su opinión, ¿qué tan importantes son las habilidades de pensamiento crítico en nuestra sociedad?
4. ¿Cómo trabajas para fomentar estas habilidades en tus lecciones? (Posibles preguntas de seguimiento)
5. ¿Utilizas tecnologías educativas en tus lecciones? (Smartboards, beamers, televisores, plataformas online, etc)
6. ¿Podrías brindar ejemplos de cómo usaste la tecnología en el aula?
7. ¿Considera que el uso de la tecnología le ayuda (o le ayudará) a proveer una mejor experiencia de aprendizaje a los estudiantes? (Posibles preguntas de seguimiento)
8. ¿Crees que el uso de la tecnología en el aula ayudará a los estudiantes a pensar de manera más crítica? ¿Por qué? (Posibles preguntas de seguimiento)
9. ¿Crees que las tecnologías educativas mejoran la experiencia de enseñanza y aprendizaje? (Posibles preguntas de seguimiento)
10. ¿Crees que las tecnologías educativas deben estar presentes en el aula? ¿Por qué?

Translation

1. Background as a teacher
2. As a teacher, how would you define critical thinking?
3. In your opinion, how important are critical thinking skills in our society?
4. How do you work on fostering these skills in your lessons? (Possible follow-up questions)
5. Do you use educational technologies in your lessons? (Smartboards, beamers, TVs, online platforms, etc)
6. Can you give examples of how you use technology in the classroom?
7. Do you consider that using technology help (or will help) you to deliver a better lesson? (Possible follow-up questions)
8. Do you think that the use of technology in the classroom will help/helps students to think more critically? Why? (Possible follow-up questions)
9. Do you think that educational technologies improve the teaching and learning experience? (Possible follow-up questions)
10. Do you think that educational technologies must be present in the classroom?

Appendix 2. Chronogram of interviews

Date	Participant
May 12th, 2022	Participant 1
May 13th, 2022	Participant 6
May 16th, 2022	Participant 8
May 18th, 2022	Participant 7
May 19th, 2022	Participant 9
May 21st, 2022	Participant 2
May 21st, 2022	Participant 3
May 21st, 2022	Participant 4
May 24th, 2022	Participant 5
May 25th, 2022	Participant 10

Table 2. Chronogram of Interviews

Appendix 3. Example of Coding

Data Analysis

Participant 1

Data	Codes
Q1 **Interviewer**: Son 14 años entonces obviamente tuviste tuviste diversas experiencias durante tu tiempo como docente y pudiste ver varios comportamientos en el aula y también como una transición sabemos que en Paraguay la educación quizás tampoco retrasada en el sentido macro de la palabra que tenemos una falta de de equipo y demás pero estuviste entonces como en medio en esa en esa transición de la digitalización de lo que es la educación desde la época… no sé desde qué año sería que estuviste enseñando? **P1:** Bueno eh aproximadamente 2002… en el 2002 empecé a enseñar que fue cuando… bueno yo considero que ahora mismo yo tengo 38 años, así haciendo un cálculo rápido serían aproximadamente como casi 20 años pero de manera formal si estoy hace 14 años y en lo que es la docencia y si vi esa transición y creo que hasta ahora estamos en esa transición justamente con un por lo que mencionaste verdad que como nuestro país es realmente un país subdesarrollado va peleando lamentablemente para poder incursionar totalmente en lo que es la digitalización tanto de la educación como también a un nivel país. Es algo que cuesta porque la educación tiene que estar dentro de la sociedad y es nosotros los educandos o sea nosotros los docentes está el poder formar a nuestros alumnos por lo que justamente salgan ya en ese mundo digital pero obviamente hablando en el hoy es una realidad para los estudiantes que yo creo que lo con con quienes más se lucha es con con los padres verdad quienes están desajustados en el uso de la tecnología. Sin embargo, los alumnos vuelan con la tecnología y está en nosotros mucho más en mí que estoy en el área de informática el formales de manera correcta para que el uso de la tecnología sea para un bien y no para que sea un medio que les lleve algo que no quieren	Paraguayan Context Teacher's Role
Q2: pero como profesor y en tu experiencia así ¿cómo vos definirías el pensamiento crítico de las personas? ¿qué es para vos pensar críticamente? **P1:** bueno, mira que a mí me compete mucho lo que es el pensamiento crítico porque porque el pensamiento crítico es donde vos por decir vos recabas datos para poder analizar un problema en un problema específico que se se presenta uno analiza esos datos por decir así	Definition of critical thinking

que que uno tiene para finalmente poder darle una solución verdad. Ese pensamiento crítico no es fácil de desarrollar en una de las cosas que yo siempre le digo a los profes, nosotros no le enseñamos a nuestros alumnos a poder razonar sobre una problemática. Es una falencia nuestra educación él sinceramente en la educación paraguaya… no voy a decir el niño porque… pero si el niño también ya en el nivel escolar en el ciclo básico que sería aproximadamente entre los 6 años y 11 años tendría que desarrollar la capacidad de poder analizar algo que uno le presenta entonces ahí yo veo una falencia por qué porque pasan conmigo y llegan a un nivel donde ya no es mecánico lo que uno le enseña sino que tiene que resolver un problema darle una solución y para eso debe tener un pensamiento crítico pero ese pensamiento crítico debe ser desarrollado desde abajo o sea desde las primeras desde los primeros grados ya sea en el primer grado hasta el sexto grado que como dije en primer grado entrar a los 6 años y en sexto grado han terminado todos los 11 años y necesitan desarrollar ese pensamiento crítico obviamente aplicando eso a su nivel porque el nivel que yo aplico con mis estudiantes de 15 o 16 años no voy a aplicarlo con un chico de 6 o 7 años sino que aplico un planteamiento diferente. Pero yo me doy cuenta porque porque mis alumnos entran y uno plantea una situación fácil básica pero no tienen la capacidad de poder razonar sobre eso y el pensamiento crítico hacia ahí verdad cuando uno a uno se le presenta un problema, recibe ese problema, pero el pensamiento crítico te lleva a analizar ese problema para finalmente darle una solución. Entonces ese pensamiento crítico está en nosotros el desarrollar en nuestros alumnos. Yo te puedo hablar mucho más porque como soy analista de sistemas y una de las materias principales de la rama de la informática que es algoritmia es justamente donde se le da solución a los problemas porque tiene 3 procesos: el proceso de entrada donde uno recibe los datos, después está el segundo paso que sería el proceso donde no procesa esos datos para finalmente llegar al tercer paso que es la solución que sería el la salida la solución a ese problema planteado. Entonces uno se da cuenta ahí mira a esa manera y otra o sea yo me doy cuenta porque le planteó algo específico a mis alumnos y ahí obviamente gente que se destaca hay gente que tiene una capacidad de razonamiento diferente alguien que marca la diferencia en el grupo o pueden ser uno o pueden ser un poco más verdad que podrían ser 2 3 y en mi caso por ejemplo tengo 5 personas en el aula 5 estudiantes que se destacan impresionantemente, que su razonamiento es muy rápido entonces en comparación a los demás alumnos. Entonces siempre va a haber eso, eso es algo natural verdad porque todos nacemos con una capacidad diferente. A algunos le va a costar un poco más llegar al punto a otros les cuesta menos y entonces el pensamiento crítico nosotros tenemos… al menos yo, hablando de la educación paraguaya, se tiene que trabajar desde abajo desde las primeras aulas se debe trabajar de una manera diferente, ¿por qué? porque después el alumno no razona y no razona simplemente para las materias, eso es para la vida. En la vida se te va a presentar justamente problemas donde uno tiene que tener la capacidad de poder analizar y después darle una solución. Entonces yo creo que la educación que nosotros le brindamos a los niños y adolescentes y jóvenes también es muy importante para su vida. Yo siempre le digo a mis estudiantes: "no estudien para el examen, estudien para la vida", porque al menos en lo que a nosotros damos en una materia de informática son cosas que le va servir para su vida en el día de mañana cuando entre en el ámbito laboral y entonces es algo muy interesante el tema de los del pensamiento crítico porque realmente yo no sé si esta investigación está basado netamente para nuestro país o como verdad, pero realmente es un tema muy interesante hacer tratado en nuestra educación. Porque te puedo decir que ese problema no está no es solamente para la institución donde yo estoy, sino que es a un nivel global a un nivel país. Entonces es una sinceramente una de las cosas que siempre me preocupo y yo le expreso a mí a los números le digo la verdad que me he preocupado porque se nota que no nunca despertaron el razonamiento. Nunca despertaron el yo Leo, entiendo y procesos los datos para poder finalmente darle una solución entonces es algo que preocupa y se tendría que ver la manera de poder mejorar. Entonces esa es mi experiencia clase si yo puedo compartir contigo **Int:** ¿Entonces lo que vos estaría diciendo es que el el pensamiento crítico y la capacidad de procesar la información para resolver problemas y tomar decisiones acertadas? **P1:** Así mismo, si Así mismo	Teacher's perception of CT in the classroom Importance of critical thinking

Q3: Entonces mencionaste ya un poco, en un ámbito más general, ¿por qué crees que esta habilidad es tan importante para la sociedad? Ya sea la sociedad paraguaya o quizá la sociedad en general en todo el mundo verdad **P1:** Porque justamente las personas no saben cómo encarar muchas veces los problemas por eso te digo desde mi punto de vista de analista a nosotros siempre nos enseñaron en la Universidad de que un analista de sistemas no va a ser capaz solamente de poder analizar un sistema para poder o viene un cliente y te dice sabes que necesito. Esto ese es el dato que nosotros necesitamos el dato de entrada y ese dato de entrada yo proceso para finalmente darle un resultado a al cliente verdad. Siempre nos enseñaron en la Universidad de que uno no solamente va a ser capaz de poder analizar la situación de un cliente que éste presenta para poder desarrollar en un software que necesite para su negocio. Sino que va a tener la capacidad mucho más a tener la mente mucho más amplia para poder resolver problemas, y no hablamos solamente de lo que, en la informática, sino que de un ámbito general. Entonces en que eso beneficia a la sociedad porque nosotros tenemos que convenir en algo de que el mundo no termina cuando termina el colegio y uno no termina de justamente tener un pensamiento crítico cuando termina el colegio ahí es donde aplicamos el pensamiento crítico que nosotros vinimos aprendiendo desde pequeños. Yo siempre considero una cosa, es importante meterle en aprietos entre comillas a los niños. ¿Por qué? porque el niño necesita aprender justamente a buscar soluciones verdad. Qué va a hacer en ese caso porque nadie le hace esa pregunta a los niños, entonces el pensamiento crítico no se desarrolla. Entonces no es importante obviamente en su nivel y hasta tan cierto punto y después la ayuda al niño y le decís "mira en este caso puedes hacer esto para poder solucionar esta manera". Entonces se va desarrollando en el niño la capacidad de poder pensar, él ya conoce la situación en toma eso piensa "cómo puedo hacer para solucionar esto" y le da una solución y si no logra solucionar no importa porque ellos están aprendiendo desde su nivel. Entonces es demasiado importante desarrollar eso en ello porque porque el día de mañana nosotros queremos queremos cuando salgan ellos sean ciudadanos de bien para nuestra sociedad. Una sociedad para que pueda crecer necesita de personas con pensamiento crítico, ¿por qué? porque van a tener la capacidad de poder analizar la situación y poder darle una solución, una solución acertada como bien dijiste hace rato verdad. Porque es lo que la sociedad necesita verdad para poder cambiar muchas realidades a menudo en nuestra sociedad, no hablo no solamente en nuestro país sino ahí sí ya me refiero a la sociedad global. Todo el mundo necesitamos necesitamos eso porque la gente va perdiendo esa habilidad y cuando no tiene pensamiento crítico entonces buscan otra salida y muchas veces esas vías son pueden ser agresivas pueden ser sin empatía pueden ser muchísimas cosas. Podemos citar de la manera cómo podrían resolver de una manera equivocada pero cuando tienen ese pensamiento crítico uno va a tener la capacidad de poder buscar una solución acertada. Eso es lo que te puedo decir con respecto a eso.	
Q3: Interesante. Y entonces ¿cómo vos harías por ejemplo o cómo haces en tus lecciones como profesor, ya sea en las materias que enseñas, creo que me enseñas música e informática, ¿cómo harías para fomentar el pensamiento crítico en tus lecciones? Algún ejemplo puede ser de tu materia en específico o algún ejemplo en general que usarías para para fomentar esa habilidad **P1:** Mirá, yo enseño 3 materias específicas en la rama informática enseño una materia que se llama algoritmia que es donde trabajamos el razonamiento justamente. Enseñó otra materia que se llama viniste informática que se divide en 2 partes que es software y hardware entonces agendo algoritmia se le plantea es justamente como un pensamiento crítico uno le plantea obviamente le enseña una estructura al alumno que le ayuda a poder darle una solución al problema planteado. Se le plantea al alumno el problema y obviamente ya previamente explicabada la estructura que uno tiene que seguir para poder darle una solución al problema. ¿Por qué? porque esa estructura se aplica a cualquier problema pero hay que utilizar el razonamiento para poder saber cómo le aplicó para poder dar la solución. Entonces yo planteo el problema y le digo a ello bueno resuelvan. Y ahí ellos tienen que hacer justamente los 3 procesos el de entrada donde leen el problema entienden y hacen el procesamiento donde hacen los pasos para finalmente darle una solución que sería la salida. Entonces en esa materia aplicó de esa manera porque es netamente eso esa materia se plantea el problema se analiza y se le da una solución. Ahora bien, estábamos con una materia donde estábamos	Teacher's practices to Foster CTS

desarrollando… estamos en realidad desarrollando lo que sería HTML que es para poder crear páginas web y les di la base la base a mis alumnos y yo les digo "miren ustedes si quieren ser buenos informáticos no pueden depender de lo que nosotros enseñamos en el colegio. Hoy en día existe una herramienta poderosa que es el internet que ustedes más que nadie conoce y pueden utilizarlo para poder ser los mejores en el área". Tal vez así que me ocurre actualmente es algo que está pasando que un grupo de 6 alumnos se juntaron y en base a investigación… sí yo tengo que enseñar del cero al 100 y con mis alumnos normalmente o sea normalmente tendríamos que estar pone en el del cero al 30 hasta el 30 llegamos pero esta gente está en el 70. Es decir que en base a investigación ellos pasaron absolutamente todo lo que teníamos que haber desarrollado hasta el momento por qué porque ellos justamente lo que hicieron fue qué cosa desarrollaron ese pensamiento crítico porque porque ellos querían aprender más y qué hacen ellos toman eso y yo les dije bueno y ahí tienen ustedes la herramienta poderosa que es internet. Se les da la información y ¿que hacen ellos? ellos tomaron esa información empezaron a investigar y gracias a eso ellos están súper avanzado entonces en esa materia por ejemplo ellos desarrollaron de esa manera esa capacidad verdad y es tan interesante y a la vez entre comillas un problema verdad porque tengo un desfasaje entre un grupo y otro pero es algo bueno algo motivante para ellos y eso uno lo puede notar en clase y da gusto porque uno ve que el alumno se interesa y él te dice por favor yo cuando salgo acá de la del colegio yo ya quiero ser un programador ahora por ejemplo yo ya me quiero dedicar al rubro entonces ya uno ve como tiene esa proyección de vida eso es bastante agradable porque ellos justamente están siguiendo la carrera de informática, bachillerato técnico en informática, porque quiere decir que se quieren dedicar al rubro bueno entonces bastante alentador	
Q4: qué interesante, ahora justamente como sos profe de informática lo que me llama la atención es que si o si utilizas tecnologías educativas en tus lecciones ¿verdad? ¿Qué clases de tecnología por ejemplo está en el aula? **P1:** bueno no sé si podemos nombrar las plataformas que utilizó **Int.:** sí sin problema sin problema **P1:** bueno generalmente cuando nosotros hicimos un trato con mis alumnos yo les dije a ello nuestra clase va a ser netamente práctica pero con la condición de que usted la parte teórica tiene que desarrollarlo en su casa por qué dicen profesor nos queremos aprender más que hemos más más más aprender sobre este tema porque se engancharon justamente con el tema entonces ellos dicen la parte teórica me pareció una pérdida de tiempo entre comillas verdad pero yo le siempre le digo mira no puedes hacer algo y no entender lo que estás haciendo tienes que entender lo que estás haciendo entonces la base teórica es muy importante. Entonces qué hacemos, la parte teórica lo desarrollan en sus casas yo cargo la actividad en classroom qué es lo que utilizamos doy la fecha doy una hora de entrega, ellos desarrollan el trabajo tal cual como uno le pide. En la clase presencial por decirlo así yo les explico cómo se va a desarrollar el trabajo ellos lo hacen en su casa y lo entregan dentro de esta plataforma y obviamente dentro de mi clase no sé si te referís a plataformas virtuales o si… Ambos. en el colegio en la Junta ahora de la institución tenemos instalados los programas que necesitamos para poder desarrollar las materias específicas que tenemos cuentan con computadoras proyectores y demás ahora tenemos en mi clase si tengo un proyector de cuánto con aproximadamente 14 equipos en computadoras de mesa que está disponible para que los alumnos puedan utilizar y es bastante interesante poder tener esta facilidad porque la mayoría de los colegios de ese entorno… porque debemos debemos aclarar y resaltar también es algo muy importante que el colegio se encuentra en una zona de mucha precariedad que es él bañado norte qué es la zona sinceramente es la zona más precaria prácticamente de nuestro país acá en en Asunción porque la escuela se encuentra en el puerto botánico en Asunción y en el bañado norte en específico verdad donde trabajamos con adolescentes niños y jóvenes de escasos recursos que vienen de una sociedad devastada alrededor y el objetivo principal nuestro como institución es cambiar esa realidad social de la que ellos vienen y poder preparar para que sean personas de bien y puedan ser diferentes a los demás y demostrar ellos que sí se puede, se puede cambiar se puede cambiar ese esta realidad social que tienen actualmente ellos. Entonces eso es bastante interesante podemos contar con esos equipos importantes porque no es la realidad en el Paraguay tener un laboratorio informática ya mucho sinceramente.	Perceptions of tech

Q5: Entonces es ¿vos consideras que tener esa tecnología en el aula en ayuda a proveer una mejor experiencia de aprendizaje o es algo que se puede lograr igual sin tecnología? ¿Se puede lograr igual tecnología una buena experiencia de aprendizaje o la tecnología ayuda en cierto sentido? **P1:** Mirá, hoy en día hablar de tecnología pues es hablar del presente si uno no cuenta con tecnología está atrás y no te voy a decir que sí es del cero al 1000 no te voy a decir que estamos en el 999 nosotros estamos en el ciento 100 o 150 y mira que está muy mal es algo que realmente a mí me preocupa. Yo sinceramente en la escuela me siento privilegiado me siento privilegiado por ellos o sea ellos tendrían que sentirse privilegiados de contar con esa facilidad de tener esos equipos de poder acceder a esos equipos para poder recibir una educación ello porque porque actualmente también trabajó como consultor en la en una Universidad y en esta Universidad vienen personas que nunca han tocado a una computadora. Y no es que yo no estoy exagerando cuando digo que nunca tocaron en realidad nunca tocaron y no sabían encender la computadora y yo vienen a estudiar la carrera o de análisis de sistemas informáticos o estudiar lo que sería la ingeniería informática y uno uno piensa venir a estudiar eso sin haber tocado jamás una computadora. Y hay alumnos que vienen del bachillerato técnico en informática que están absolutamente muchísimo más adelantado que ellos entonces ahí yo ya yo creo que respondo tu pregunta y yo no porque entonces quiere decir que es sumamente importante o sea hoy en día no contar con la posibilidad de acceder a tecnología están atrasados verdad y es más dejó al descubierto eso la pandemia, ¿Por qué? porque en la pandemia muchísimos sectores de nuestro país no pudieron acceder a la educación. ¿Por qué? porque a nivel central en a nivel central de nuestro país lo que el departamento central de nuestro país sí tiene conectividad o sea si tiene acceso a internet. ¿Pero qué pasa con nuestra sociedad en nuestra sociedad? hay mucha gente que ni siquiera tenía para poder cargar saldo no no tenían para poder cargar de megas al celular para poder acceder a la educación. Tal es así que el MEC sí logró un convenio para poder tener acceso a una plataforma educativa de manera gratuita para que puedan acceder a la educación a través de eso. Pero hay sectores en nuestro país que eran lejanos departamentos que están allá en los limites ya con otras con otros países que no tienen conectividad. Entonces lo los docentes mismos tenían que preparar las copias y llevar inclusive repartían casa por casa los docentes los materiales obviamente siempre con toda la seguridad que con la bioseguridad para poder entregar los materiales de estudio a sus alumnos y es triste… era triste ver eso… y nuestra sociedad en realidad pensando que en la sociedad paraguaya nos falta muchísimo, es triste que nosotros no podamos acceder a la educación de una manera óptima. Es más, hasta hace poco estaba haciendo justamente un trabajo de investigación sobre eso donde nuestro país tiene la tasa más alta de matriculaciones a nivel latinoamericano. 6 de cada 10 niños no pueden acceder a la educación. Entonces uno mirando eso realmente uno se pregunta hacia que vamos. ¿Cuál es la sociedad que vamos a tener de acá a 20 años? cualquier tiempo futuro que le espera a este país y a mí como educador eso me entristece y me preocupa realmente me causa me causa mucha tristeza y a la vez también me causa mucha impotencia porque no podemos solucionar todo es imposible y yo te estoy hablando del sector de alumnos pero si vamos al sector de docentes… muchos docentes se vieron… era como una vivir una película de terror para muchos en la época de pandemia donde tenían que utilizar los recursos informáticos para poder dictar sus clases. Tal es así que tuve que hacer también una capacitación para los docentes para que puedan utilizar los entornos virtuales de educación para que pueda impartir sus clases y realmente la pandemia dejó al descubierto los retrasados que nosotros estamos en cuanto al uso de la tecnología. Partiendo desde arriba los docentes y yéndonos hacia abajo los alumnos por falta de acceso a la conectividad y obviamente ahí hablando de los equipos tecnológicos que no tenían una notebook, máximo tenían un celular para poder conectarse a las clases entonces… es triste pero esa es la realidad	in the classroom
Q6: ¿vos creerías que involucrar más tecnología en el aula o contar con una quita momentos óptimos en el aula ayudaría a desarrollar este proceso de pensamiento crítico en los estudiantes? o ¿crees que son cosas por separadas que la tecnología pensamiento crítico no van de la mano o que sí son variables que influyen entre sí? **P1:** yo creo que combinar ambos fragmentos sería lo ideal. ¿por qué por qué digo esto? porque no siempre va a estar presente en la tecnología pero el manejo es sumamente importante sí es sumamente importante más todavía así como una acabo de decir es el presente vos no manejas tecnología estás desfasado. O sea estás atrás, no estás actualizado,	

por ende vas a perder muchas oportunidades y lo ideal sería tener una sociedad preparada para el uso de la tecnología. Pero el uso de la tecnología es por una parte, pero como digo se tiene que fusionar ambas herramientas porque no siempre va a estar presente en la tecnología para poder desarrollar el pensamiento crítico. Te explico una cosa por ejemplo que yo aplico con mis alumnos que es una regla básica dentro del algoritmia. En algoritmia primero es re entender razonamiento, pero, ¿donde se razona primero? se razona en el cuaderno en la hoja ahí se razona se razona primero allí porque porque una vez yo entendido porque se supone que yo estoy familiarizado con un cuaderno porque siempre vi un cuaderno de el nivel más bajo de la escuela y cuando yo voy avanzando entonces yo entiendo el problema que yo desarrollé en el cuaderno luego eso yo llevo a la herramienta informatica sí entonces se combina se fusiona se fusionan porque porque yo el pensamiento crítico que es el pensamiento es el análisis de una situación específica para poder procesar esto y darle una salida o sea una solución lo hice primero en el cuaderno porque yo lo comprendí y después eso que yo comprendí lo llevó a la herramienta informática entonces yo creo que el pensamiento crítico debe ser fusionado entre la tecnología y las situaciones cotidianas de la vida porque yo para poder para poder solucionar algo no siempre voy a recurrir a la tecnología.	Relationship between EdTech and CTS
Q7: ¿Sería entonces más como un como un material secundario de apoyo para desarrollar esa habilidad? ¿eso es lo que me estaría diciendo? hablando más como unas herramientas de apoyo. Informáticamente hablando yo te diría que nosotros informáticos necesitamos sí o sí de ese de ese material para poder hacer lo que a nosotros en nuestra área nos compete no así otras áreas sí entonces sí sería como un como un material de apoyo la tecnología, pero es fundamental, ¿por qué te digo que es fundamental? porque a través de la tecnología uno va a poder incrementar sus conocimientos que solamente yo podría hacerlo en un aula con 10 personas. Eso se va a quedar ahí y él de acuerdo con el conocimiento que los demás tienen, pero en internet uno puede encontrar muchísima variedad de esos conocimientos entonces poder funcionar. Desde mi punto de vista es fusionar una parte de lo hacemos haciendo el pensamiento crítico ponerle en una hoja a través de la implementación de un problema en específico que se pone en el pizarrón todo el mundo empieza a opinar sobre eso y da su opinión con un pensamiento crítico, pero después llevarlo a la tecnología entonces para poder tener más recursos e incrementar él conocimiento **Q8:** Entonces, ¿vos creerías que la tecnología debe estar presente en el aula? no solamente para la materia informática sino también para para otras materias. sí sí fundamental debe estar presente	
Q9: Excelente, entonces… ¿creerías que estas tecnologías educativas ayudarían a mejorar la experiencia de enseñanza y aprendizaje eso sería algo recíproco para los estudiantes tanto como para docentes que sea como una herramienta que mejore en sí todo el ambiente dentro del aula? cuál sería tu opinión sobre eso? Bueno existen diferentes tipos de aprendizaje si uno uno va a ir aprendiendo a uno es visual otros son auditivos, pero hoy en día como los niños literalmente crecen con el celular en la mano y es audiovisual y ellos aprenden muchísimo a través de los audiovisuales. El docente puede impartir su clase, pero a la vez tener un material de apoyo de manera digital donde puede tener un proyecto en clase y comparte un video referente a eso porque mira te digo una cosa es muy diferente que yo diga una cosa a que yo muestre una cosa yo te estaba hablando. Vamos a ponerle que estamos en el Ártico verdad y en el Ártico ay qué sé yo hay hielo en la Antártida qué sé yo hay hielo y vos le hablas de eso y la criatura y se hace una idea. Pero es muy diferente que vean un vídeo corto y le des esa experiencia al alumno. Y yo le voy a decir después quiero que me haga una descripción de lo que acaban de ver. ¿Decime si el impacto no es diferente? es muy diferente porque una cosa es lo que yo digo pero otra cosa es la que yo ellos pudieron ver en. Es una experiencia diferente verdad porque yo puedo hablar de Inglaterra a través de lo que yo puedo estar viendo a través tuyo por ejemplo, pero una cosa diferente es estar ahí que es en tu caso muy diferente. Son experiencias diferentes pero experiencia al fin que a nosotros nos permite la tecnología la tecnología no permite tener esa experiencia porque yo puedo decir mira Guillermo está en Inglaterra y en Inglaterra hay esto,	

esto y esto. Y bueno super, hasta ahí. Pero diferente y quieren ver y le mostrás… guau mira lo que es eso verdad. Es otra experiencia. Sin embargo en tu persona que estás ahí viviendo en propia carne es otra experiencia totalmente diferente. Entonces hablamos de ese tipo de experiencias entonces yo digo que es muy importante la con la fusión entre lo que es él hablar impartir la clase hablando, mostrando la clase en el pizarrón, pero mostrar un material audiovisual en su incrementa muchísimo más la experiencia del alumno y también por el del aprendizaje porque hay muchos alumnos que te van a aprender de esa manera que simplemente cuando vos estás diciendo algo entonces esa es mi opinión con respecto a eso.	

Table 3. Example of Coding

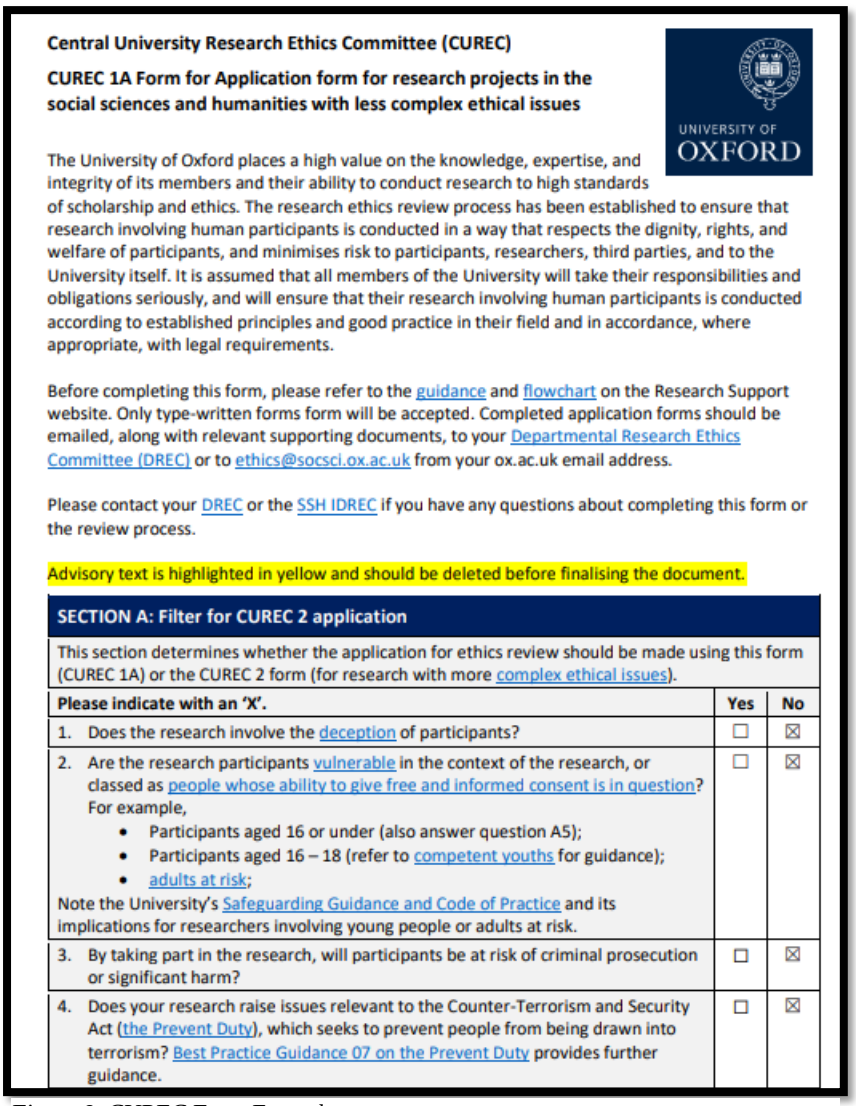
Appendix 4. Coding subthemes

Teachers Perception of CTS in the classroom	
Key concept / Word / phrase	**Supporting declarations**
CTS perception in the classroom	**P1:** that is, I realize because I proposed something specific to my students and there are obviously people who stand out, there are people who have a different reasoning ability, someone who makes a difference in the group, or it can be one or they can be a little more. They could be 2 or 3, and in my case for example I have 5 people in the classroom, 5 students who stand out impressively, that their reasoning is very fast then compared to the other students
	P2: in the school or the year 11, 12 and 13, when they question certain lyrics, see certain letters ... "and why he says this" "why he refers to this".
	P4: One of the aims of education is to create agents of good for society, says one of the ends of education. So, if we look for that we should also look for each student or each person to have a critical thought or a unique thought for society so that it can contribute something to society.
	P3: here many times we do not think, our young people suddenly do not think, they simply put a quick reading and many times they did not even understand what they read.
	P5: That they don't want to read, that they don't want to understand, that they are... how I'm going to explain.... They are shy, a little shy but don't want to think.

Figure 8. Coding Subthemes Example

In appendix 3 we can appreciate the general coding from the transcripts. Those codes were then moved to different tables according to their themes to be analysed individually again and obtain subthemes for a more accurate analysis, as it can be appreciated in appendix 4.

Appendix 5. CUREC Form



Central University Research Ethics Committee (CUREC)

CUREC 1A Form for Application form for research projects in the social sciences and humanities with less complex ethical issues

UNIVERSITY OF OXFORD

The University of Oxford places a high value on the knowledge, expertise, and integrity of its members and their ability to conduct research to high standards of scholarship and ethics. The research ethics review process has been established to ensure that research involving human participants is conducted in a way that respects the dignity, rights, and welfare of participants, and minimises risk to participants, researchers, third parties, and to the University itself. It is assumed that all members of the University will take their responsibilities and obligations seriously, and will ensure that their research involving human participants is conducted according to established principles and good practice in their field and in accordance, where appropriate, with legal requirements.

Before completing this form, please refer to the guidance and flowchart on the Research Support website. Only type-written forms form will be accepted. Completed application forms should be emailed, along with relevant supporting documents, to your Departmental Research Ethics Committee (DREC) or to ethics@socsci.ox.ac.uk from your ox.ac.uk email address.

Please contact your DREC or the SSH IDREC if you have any questions about completing this form or the review process.

Advisory text is highlighted in yellow and should be deleted before finalising the document.

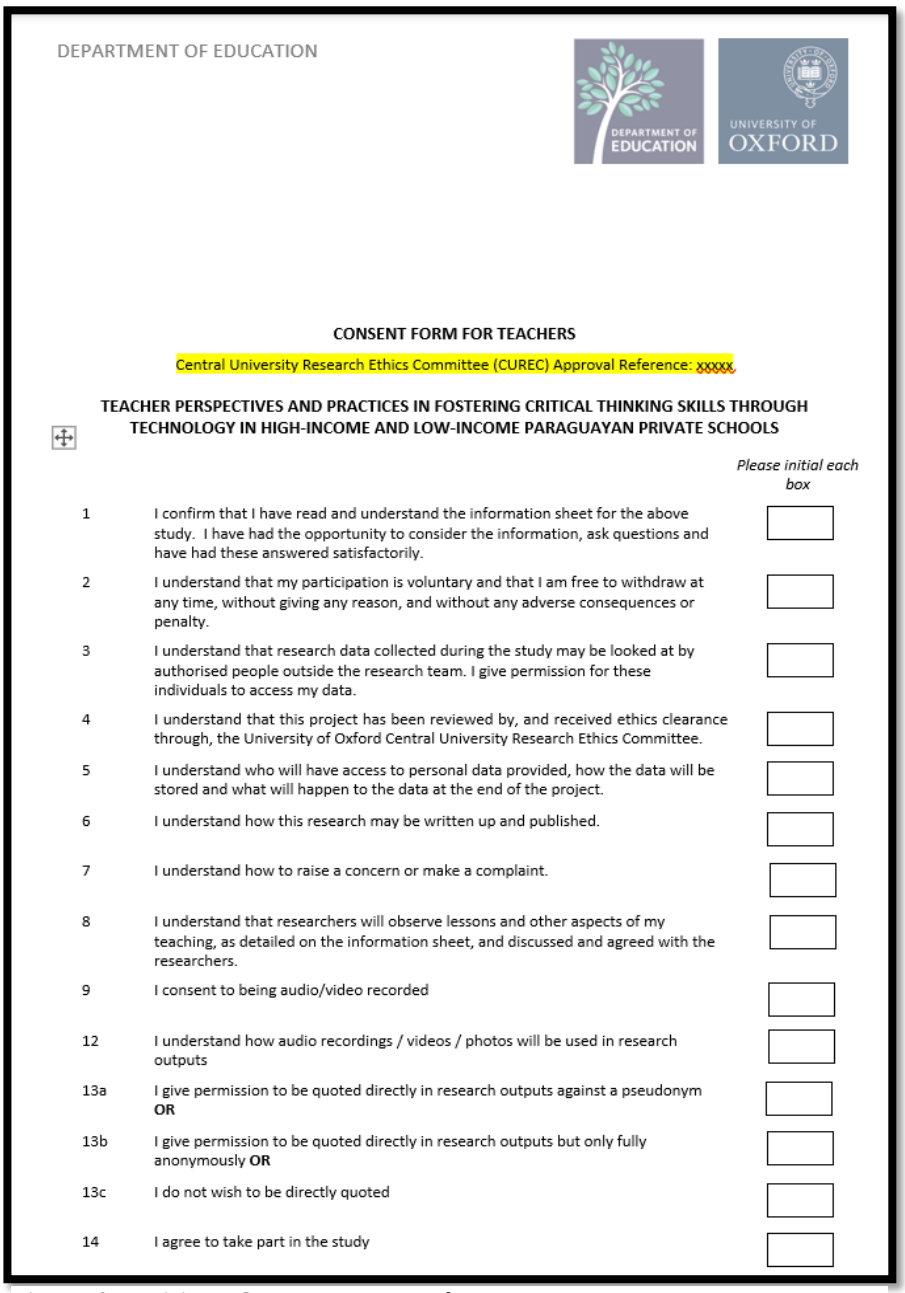
SECTION A: Filter for CUREC 2 application		
This section determines whether the application for ethics review should be made using this form (CUREC 1A) or the CUREC 2 form (for research with more complex ethical issues).		
Please indicate with an 'X'.	**Yes**	**No**
1. Does the research involve the deception of participants?	☐	☒
2. Are the research participants vulnerable in the context of the research, or classed as people whose ability to give free and informed consent is in question? For example, • Participants aged 16 or under (also answer question A5); • Participants aged 16 – 18 (refer to competent youths for guidance); • adults at risk; Note the University's Safeguarding Guidance and Code of Practice and its implications for researchers involving young people or adults at risk.	☐	☒
3. By taking part in the research, will participants be at risk of criminal prosecution or significant harm?	☐	☒
4. Does your research raise issues relevant to the Counter-Terrorism and Security Act (the Prevent Duty), which seeks to prevent people from being drawn into terrorism? Best Practice Guidance 07 on the Prevent Duty provides further guidance.	☐	☒

Figure 9. CUREC Form Example

In figure 14, a part of the CUREC form can be seen. This is the form that is completed to receive approval from the university's ethics committee to conduct the research. For further information you can visit this link:

https://researchsupport.admin.ox.ac.uk/governance/ethics/committees/curec

Appendix 6. Participant consent form



DEPARTMENT OF EDUCATION

CONSENT FORM FOR TEACHERS

Central University Research Ethics Committee (CUREC) Approval Reference: xxxxx

TEACHER PERSPECTIVES AND PRACTICES IN FOSTERING CRITICAL THINKING SKILLS THROUGH TECHNOLOGY IN HIGH-INCOME AND LOW-INCOME PARAGUAYAN PRIVATE SCHOOLS

		Please initial each box
1	I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or penalty.	☐
3	I understand that research data collected during the study may be looked at by authorised people outside the research team. I give permission for these individuals to access my data.	☐
4	I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.	☐
5	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	☐
6	I understand how this research may be written up and published.	☐
7	I understand how to raise a concern or make a complaint.	☐
8	I understand that researchers will observe lessons and other aspects of my teaching, as detailed on the information sheet, and discussed and agreed with the researchers.	☐
9	I consent to being audio/video recorded	☐
12	I understand how audio recordings / videos / photos will be used in research outputs	☐
13a	I give permission to be quoted directly in research outputs against a pseudonym **OR**	☐
13b	I give permission to be quoted directly in research outputs but only fully anonymously **OR**	☐
13c	I do not wish to be directly quoted	☐
14	I agree to take part in the study	☐

Figure 10. Participant Consent Form Example

The participant consent form that teachers needed to sign and hand in before participating in the interviews.

Appendix 7. Teachers' perception of CTS in the classroom. Low and High-SES Analysis

Teachers Perception of CTS in the classroom	
Key concept / Word / phrase	**Supporting declarations**
CTS perception in the classroom	**P1:** that is, I realize because I proposed something specific to my students and there are obviously people who stand out, there are people who have a different reasoning ability, someone who makes a difference in the group, or it can be one or they can be a little more. They could be 2 or 3, and in my case for example I have 5 people in the classroom, 5 students who stand out impressively, that their reasoning is very fast then compared to the other students
	P2: in the school or the year 11, 12 and 13, when they question certain lyrics, see certain letters ... "and why he says this" "why he refers to this".
	P4: One of the aims of education is to create agents of good for society, says one of the ends of education. So, if we look for that we should also look for each student or each person to have a critical thought or a unique thought for society so that it can contribute something to society.
	P3: here many times we do not think, our young people suddenly do not think, they simply put a quick reading and many times they did not even understand what they read.
	P5: That they don't want to read, that they don't want to understand, that they are... how I'm going to explain.... They are shy, a little shy but don't want to think.

Figure 11. Teachers Perception of CTS in the classroom - Low-SES analysis

Teachers Perception of CTS in the classroom	
Key Words / Phrases	**Supporting declarations**
Lack of participation and interest	**P8:** The first critical thought that we as a teacher in the music area that we face is when the children tell us how is this useful for my life, if I do not want to be a musician how will it be useful for me. So, it is the first "but" critical that we have of the students…
	P10: From our perspective here in Paraguay I suddenly find it very difficult for the student to have a critical thinking. Counted with your fingers you are going to have guys who can give you a critical thought to something, even now I after this pandemic I feel that the pupils try to think the least, the least effort they can make and it is something that costs us much more, because suddenly you are talking about a topic x in English and what do you think, what is your opinion, you want to take that information to see if it tells you the truth. And he doesn't look at you and they don't tell you anything, I think about what to do, I don't know if I ask my questions wrong or how can I make them achieve that.
	P10: That is, using a lot of information, but what happens the pupil does not have that information because he does not read, he does not feel like it. If you don't read, you're not going to be able to give me an explanation of why this and this, it may be, there may be a guy who does that to you. But what happens, not everyone, that is, not 100% of the class has that baggage of information that one needs to be able to have a really analytical thought true on the subject.
Uncertainty about Critical thinking and Technology	**P6:** well, I don't know to what extent I use technology to get to the level of critical thinking.
	P9: what happens is that one can define intelligence in different ways, but the fact that one is intelligent, as it is traditionally said, does not mean that one has the ability to think critically.

Figure 12. Teachers' perception of CTS in the classroom - High-SES analysis

Appendix 8. Importance of Critical thinking. Low and High-SES Analysis

Importance of Critical Thinking	
Key concept / Word / phrase	**Supporting declarations**
CTS for life	**P1:** students do not reason simply for the subjects, but also for life. In life you will face problems where one has to have the ability to analyze and solve them. So, I believe that the education that we provide to children, adolescents and young people is also very important for their lives. I always tell my students: "don't study for the exam, study for life". (...) when school ends, that is where we apply the critical thinking that we have been learning since childhood.
	P3: I think it is very important when making individual decisions also, because you analyze, if your decisions cause good in others…
	P4: That is, my decisions cannot be influenced by x reason or x person. That is, I can make my decisions without being affected by what the other person thinks of that decision. Of course, we can agree or not or we can reach an agreement mutually, but that's not why I have to get angry and that's not why that other person has to get angry. I don't know if I explain myself.
	P2: I think it is too important when making individual decisions also because you analyze if that causes a good for others as well or if it only benefits me.
	P5: It is to get a result
Society wellbeing	**P1:** So, it is too important to develop that [critical thinking] in them because tomorrow we want them, when they leave, to be good citizens for our society. A society for it to grow needs people with critical thinking, why? because they will have the ability to analyze the situation and be able to give it a solution, a successful solution.
	P2: Of course, I mean, I think this is going to cause an awakening. (...) with this kind of thinking they are going to come to question those things and really think about whether what they are taught or shown is right or wrong.
	P3: If we do not know how to think we will always be dominated
	P4: Because if you don't have critical thinking, you're going to think the same or you're going to have pretty much the same thought as someone else. I mean, it's not your own identity, I don't know if I explain it right. Then we will always go the same way and there will not be a change so to speak, more in our social context.

Figure 13. Importance of Critical Thinking - Low-SES analysis

Importance of Critical Thinking	
Key Words / Phrases	**Supporting declarations**
Discern information and decision making	**P6:** Actually I am preparing the pupils precisely to be able to evaluate knowledge in different areas of life, to be able to… first with the whole issue of fake News, now more than ever, to be able to decide if it is accurate information or not, if it is useful information, understand different points of view, be able to analyze different points of view, understand inferences, right, suddenly things that are not so direct so obvious and be able to evaluate in such a way that they know how to have an opinion. Of course, later we also work the way of opinion that could be oral, could be perhaps... an objective of my classes General Studies is to reach a deeper process in the analysis and to be able to summarize the power to really use the knowledge to make decisions that will not only affect your educational process in school but as they are issues of actuality that really prepares us for life
	P7: ...people go where people go and many times that happens. You go out to dinner and where you see a place where there are not so many people as it does not generate confidence, but where there are more crowded people there also leads you to leave and the same happens with opinions, we pay attention to the loudest one or perhaps the one who is shouting louder his ideas, his opinions, that are not important or are very superficial. So, through critical thinking one can generate one's own opinion and be a really meaningful guide for others. I think that's the importance of our critical thinking.
	P8: that we achieve with the critical thinking, that goes beyond a simple song that for a long time was a boring song for many… today already has a different denotation to at least with the students to whom I teach the classes. They see in a different way because they see that a lot of the history of Paraguay is represented in that song.
	P9: Well, first to be able to analyze better. We are surrounded by fake News, that is, we will be able to interpret better in what we hear, what we read, know where it comes from and why. Let's say that's what it's for, to be able to make decisions more freely, that allows us to think critically. And in a way, to be freer true, and not depends on another.
	P10: to be able to compare things because with your critical thinking you are going to analyze well if this happens, this and this is going to happen as well.

Figure 14. Importance of Critical Thinking - High-SES analysis

Appendix 9. Paraguayan Context. Low and High-SES analysis

Paraguayan Context	
Key concept / Word	**Supporting declarations**
Lack of digitalization in Paraguay	**P1:**.and if I saw that transition and I think that so far, we are in that transition precisely with the reason you mentioned that as our country is really an underdeveloped country it is fighting unfortunately to be able to fully venture into the digitalization of both education and also at a country level. (...) the pandemic exposed how lagging behind we are in terms of the use of technology. Starting from above, the teachers, and going down, the students for lack of access to connectivity, and obviously there talking about the technological equipment, they did not have a notebook, maximum had a phone to be able to connect to the classes then ... it's sad but that's the reality.
	P2: And I carry my computer, this is what I have, and my phone. And the pupils carry their phones, that is, obviously leaving aside instruments and so on.
	P3: And in my case it is the traditional way. I have a chair, the blackboard, all the amenities, but it's more traditional. The computer science teacher (...) As I say, the traditional way, I show some videos sometimes, but it is more a class to give with the students. The students ask, if they know they answer, and we are looking for ideas, we are gathering ideas.
	P4: Well, with respect to change, I think there must be a change in our country, in our education system in terms of technology implementation. But for that change to occur, classrooms must be more than anything, for example, they must be technologically equipped
Low digital literacy	**P1:** "Today it is a reality for students, I believe that what is most fought with is with parents who are out of tune in the use of technology.
	P2: on the part of the students and the parents to perform the tasks and submit assignments there were inconveniences, they did not submit much because they did not know how to use technology. (…) Some colleagues actually struggled a lot because they're not used to it. I am a young person still, then we could say that on that side it was easier for me I think, but there were colleagues who struggled a lot. they could not or did not even know how to download a PDF most of the times for example. There was a platform in which they sent tasks or it was for the teachers, like a didactic guide and a video and many colleagues did not know how share for example.
	P3: Because in the school it is forbidden [technology] right now, you have to request in the administration a day before or 2 days before due to various reasons. First, because it is misused. In our country it is misused, it starts from home and suddenly old people like me, to tell you, we are a bit... we don't have the management that young people have, but we learn fast, yes.
	P4: What happens is that our teachers here, internationally I do not know, but our country, many think that technology is only Word Excel and PowerPoint, when technology goes further. So, if you stay only with Word Excel and PowerPoint, technology can't be used, it doesn't foster any critical thinking skill.
	P5: Yes, because teachers do need training to use the platform. (…) In my opinion to start for me at least it was a lot of stress, because I was not used to the technology and I had to learn. As they say, the pandemic helped me a lot to grow, to train according to some technologies and it was abrupt because of the pandemic, but many do not accept technology and want the traditional way of teaching.
Limitations to foster CTS	**P1:** "Because I can tell you that this problem is not only for the institution where I am, but it is at a global level at a country level. So, it is a sincerely one of the things that I always worry about and I tell it to my co-workers, tell the truth that I am worried because it shows that they never aroused the reasoning. They never woke up the "I read, I understand and think" to finally be able to give it a solution, so it is something that worries me and we would have to see how to improve".
	P3: and we continue in the same situation, on this side of the world, where teachers have their wings cut off, and you know that, that we cannot develop what we want to teach, education is rather directed.
	P4: More than anything and the important thing is the experiences of each participant in our society. It happens a lot that, I am talking about the Latin American level, that families always give everything to their children. The famous give everything. So, with this kind of attitude many times it is prevented that the child can develop by himself, then they cannot develop that critical capacity, so I think the best thing for each child would be to try to have their own experiences in certain aspects of life, certain areas of life.

Figure 15. Paraguayan Context. Low-SES analysis

Paraguayan Context	
Key Words / Phrases	**Supporting declarations**
Privilege awareness	**P6:** well, we have the platforms now, I use classroom, RenWeb, this platform that I use to organize all the material so in terms of access, that the kids have everything we do- Those platforms use now is rather as an organization. Then we have the Smart boards in the classrooms, so that makes it much easier, all our kids have their laptops and we have all wi-Fi connection. So, it's a constant in my classes at any time to use their laptops and I use the smartboard, in fact we do almost everything through that.
	P7: Look, in this institution where I am is very privileged classrooms have internet with sound equipment and a smartboard, so it makes it much easier for us.
	P8: When I had to be a student, I had music teachers using cassettes, CDs or DVDs. And in my current experience what it was to start teaching in this whole digital area, it is very important for the recordings in the presentations and so on.
	P10: So, what happens, we use the computer room, we use the smart board that always has the books in that application, which is much easier to use. Other things I use in terms of technology... I think they are the 2 things I use the most, nothing more, the applications are from ClassDojo, I use another application that is for spelling, which is called spelling City
Cultural Barriers	**P6:** And I think maybe this was always a characteristic of Paraguay, that it is actually getting worse from the rest of the world instead of improving, instead of Paraguay equalizing for good, it seems that in reality they are deteriorating the capacity for critical thinking.
	P8: For them it is very important not only to see in the books the instruments true. I grew up with a culture of good we saw the pictures of the instrument we had to colour in the book
	P10: That questioning skill is not within our culture. We are a culture that does not question, we are a culture that accepts everything that is told, because that was the way we were raised and suddenly this new generation ..., in the class or by kaigüetismo (laziness) they do not participate, or because they do not have the foundation that they would have to support the answer.
	P10: And as for the country, it would be ideal that not only the children who live in the area of the capital and central have the possibility and one that is there San Pedro or there in El Chaco don't... maybe in the Chaco they have better technology than us too, it's not because knowing the people who are out there suddenly capable that they have much better than us.

Figure 16. Paraguayan Context. High-SES analysis

Appendix 10. Teachers' Role to Foster CTS. Low and High-SES Analysis

Teacher's Role	
Key concept / Word / phrase	**Supporting declarations**
Learning and teaching digital literacy	**P1:** It is something that is difficult because education has to be within society and it is we the educators or we the teachers that have the power to upskill our students so that they just go out in that digital world. **(…)** it is in us, much more in me, that I am in the area of computer science, teach in a correct way so that the use of technology is for a good.
	P4: but I am trying to expand more knowledge in terms of online platforms that can help me make the work more practical and more dynamic and interesting. (…) But why not teach them [digital skills] from a young age to use that type of technique, then in universities ... in other words, we are going to be forcing universities to improve their technique again. I believe that this is how we are going to move forward.
	P5: Teachers do have to be trained to be able to teach according to technology and students learn more because it is an innovative way.
Foster Critical Thinking Skills	**P1:** That critical thinking is not easy to develop in one of the things that I always say to teachers, we do not teach our students to be able to reason about a problem. It is a shortcoming our education he sincerely in Paraguayan education
	P2: So, the critical thinking is our responsibility to develop in our students.
	P3: So, you have to instil in them that curiosity. It's like I always tell our students, "Be demanding with the teachers". (…) as I always say, teach them to think not what to think, but how to think. To show them the way to get to see if it is square, if it is a triangle, or a circle and not to tell them that a triangle is a triangle just because. Develop that need to know, to know, to discover, to know if the teacher is telling the truth.
	P4: So, since each child is a world, the teacher has to be several worlds in that sense. I mean, it has to have a little bit for everyone. So, you have to have a little bit of technology, a little bit of old fashioned, a little bit of modern teacher, a little bit of cool teacher and know how to combine all that to achieve a good atmosphere within the classroom, the class, and if technology is going to help to have a good environment inside the classroom, the class, then the teacher must appropriate that, do his own thing, make it part of him, and be part of the small worlds that have in his universe.
	P5: Teachers do have to be trained to be able to teach according to technology.

Figure 18. Techers' Role. Low-SES analysis

Teachers' Role	
Key Words / Phrases	**Supporting declarations**
Teach the correct use of technology	**P7:** Well... computer science and technology are a sea, an ocean in which if you release the boy there, he will be shipwrecked, he will be shipwrecked if you do not give him a direction. That's why we talked about digital natives, but I really believe that many are digital orphans. Why? because they do not have adults who fulfil the role of mentors who teach them to use technology, then it is up to us as teachers to train first in us to be able to guide them to teach them to use technological tools responsibly because if it is not going to shipwreck and the world within the computer that we find ourselves there is so dangerous, just like the world we find there on the street,
Keep themselves updated	**P6:** I think it is very important that we teachers are trained and that we make the enormous effort because as years go by it is increasingly difficult really constantly updating you with the new programs. I think it is very important.
	P9: I say first one cannot give what he does not have, the teacher has to present critically to be able to transmit to his students.

Figure 17. Teachers' Role. High-SES analysis

Appendix 11. Perceptions of the use of Tech in the Classroom. Low and High SES Analysis

Perceptions of the use of Tech in the classroom	
Key concept / Word / phrase	**Supporting declarations**
Technology as a need	**P1:** Look, nowadays talking about technology is talking about the present, if one does not have technology is outdated. (…) The teacher can teach his class, but at the same time have a support material in a digital way where he can have a project in class and share a video referring to that because, look, what I say is something but showing you what I am saying is a completely different experience.
	P2: I think so in having that technology available in the class if it is going to help a lot in every way. (…) Taking advantage of the fact that they learned a lot in the pandemic so let's bring that to classes let's try to use those resources in class. I think we should invest in it, it is something useful within the class, it makes it much easier for me in my work. I think they learn more too, which is the end and also in helping the way in which they think.
	P3: Obviously yes, but first it has to happen what I told you. Teaching would be greatly accelerated, so we would advance much faster, it would be much more graphic, what enters through the eyes because it is easier to remember, understand. Then at least my stuff would be wow, it would be spectacular. (...) And to prohibit that would be to delay, to delay your community, your students and in the end your country.
	P4: Well, I think so. Because, well, we all know we have gone through the years of global pandemic in which the use of technology was practically mandatory yes. I mean, it was something that we had to use and more than anything, to adapt. It was more for the teachers to adapt to what the kids already had.
	P5: On the blackboard we make the points, we graph the points, segment and there are some who do not understand. So, with the GeoGebra program, it is shown to them and then it facilitates more and I have better result. This was already proven last class. (...) in my case the technology helps a lot.
Keep a balance	**P1:** I think that combining both fragments would be ideal. why do I say this? because you will not always need technology, but knowing how to use it is highly important, as I said, if you do not know how to use it, you are outdated. That is, you are behind, you are not updated, therefore you will lose many opportunities and the ideal would be to have a society prepared for the use of technology. But the use of technology is on the one hand, but as I say you have to merge both tools because it will not always be present in technology to be able to develop critical thinking.
	P2: I think that the use of technology should be included now, but not in everything, that is, I mean not all the time. Because there are subjects in which we could omit now that are more practical type. (...) I would also say from a certain age true. (...) I would put from second cycle, even third cycle, which would be basically fourth grade or there more or less. (...) I think that investing in terms of technology either in a good internet, in good computers, access to information, in that way I think it would help and we should no longer return to those ... to that time where we were totally isolated from technology but trying to make technology accompany our work as a teacher.
	P3: We should go little by little, as I told you let's go the traditional, as it is happening now, I am quite traditional but open to using technology, a little hard but not reluctant to use. Then give it little by little, getting into the classes. And I repeat always training the one who knows a little less and stopping or limiting the one who knows a lot so that it is only to learn in class.
	P4: Yes, there are times when it is necessary to give a class like before and there are times when you have to give the class with more dynamism, with more... with technology, that children can use their cell phones, investigate this now on their cell phones and we work in class so I think there the classes will be more fun. If there is an opportunity for kids to bring those to classes and we have a good Wi-Fi internet service, or whatever, we can ask them to make a presentation at the end of class, they can present, which are resources that today only universities practically use.
	P5: And many are used to the traditional. But how we're moving forward and now technology is in the first place. Everything is technological, everything. And I think the technology stays
Digital Literacy / Tech Use	**P3:** It would be spectacular. It would be spectacular to include all of that. To say otherwise would be, I don't know... be lying from here to the moon. Obviously, it is very important to put all that technology but also teach me, and mainly to young people. Since childhood, since childhood instil in them the correct use because very bad use is given to our technology pitifully. (...) Teach how it should be used, what to use it for. How to use obviously all young people knows, what to use it for is the issue. Understand, give them that awareness that a misuse is going to have a bad an end. So, I think it's more than promising for our teaching, for our youth, for our country to introduce these technologies that we're talking about, that you're talking about.
	P4: now that we returned to face-to-face classes the children were left with the cell phone, the notebook, video calls, then I think you can harmonize in the class, between giving normal classes and teaching on online platforms. A point must be sought and harmonized with all this. So, if the kids like them and if you managed to find a method in which they can, that is, feel more at ease in class and learn then I think it's okay.
	P1: knowing how to use it is highly important, as I said, if you do not know how to use it, you are outdated. That is, you are behind, you are not updated, therefore you will lose many opportunities and the ideal would be to have a society prepared for the use of technology.

Figure 19. Perceptions of the use of Tech in the Classroom. Low-SES analysis

Perceptions of the use of Tech in the classroom	
Key Words / Phrases	**Supporting declarations**
Technology as a need	**P6:** yes, I am trying to teach my students and technology is helping me so that I can reach all students in a better way and not only reach a group and we are able to repeat this practice then in that sense it is helping them truth but in reality, I can do the same without technology only that technology suddenly makes it faster and reaches to everyone.
	P6: Well, I think we can't choose not to use it because the world has already changed and we have to recognize that and if our kids don't learn to use technology in the classroom they're really going to be at a disadvantage. So, in that sense I think it is not optional if we have to use it I think that in the classroom it is also a good place to just learn to have a balance in the use of technology remembering that it is a tool and only a tool
	P7: The Internet is not dangerous, the dangerous of the internet is its misuse. Well used Internet is a very important support for the teacher, this... because from the simple fact of searching for a word, the meaning of a word in the dictionary through Google, with the new term "googlear", we can find different meanings, look at images, videos and really the children access tremendous information through technology. I believe that technology is very important for the teaching work. (...) Now through technology, what's more, sometimes we find interactive playful games, the kids get engaged, they want to go on to complete or mark the correct answer, continue using a whiteboard screen, not chalk anymore, but with the acrylic slate marker where they also pass that they do the exercises is very good.
	P7: A classroom with technology is much better than without technology obviously better
	P8: The presentations begin to be all digital and for me it is very practical because the content I already have online, and I am nothing more than improving those contents that at the time prepare them from scratch because there were no such materials and now, I have now enough material developed in what is digital.
	P9: Right now, it helps because... that is, you have to communicate with the students in the way that they receive the information and they are used to it... that is, you can compete with the technology they use all day with the lack of true technology. The only thing one has to be informed and has to know how to use and teach. As much as our students use technology, it does not mean that they know how to use technology, the type of technology that we use is true.
	P10: At present, yes. Because everything is faster and the guys also got used to the rhythm of technology. Then suddenly it is already necessary. I mean, I feel, I mean, it makes your life easier.
	P10: The more we advance I think the technology is going to be much more advanced and they need to know how to use it.
Keep a balance	**P6:** do not like the idea that technology can replace a physical teacher and have physical classes, of course there are exceptions and short courses and maybe university, older people but in the case of students I think it is very important to have face-to-face classes using technology in classroom, I think is very important.
	P6: totally believe that you have to use technology and you have to use everything you can and embrace the advances, but with balance. Understanding that it does not replace the teacher and a digital classroom cannot replace a classroom where we are all together as human beings. Even it is also important to move in the classroom even with the big boys, just change groups, physically move to be just typing and looking at a screen is not good for the body and is not good for the mind and less for the eye. So, a good balance.
	P8: My view on this is that it should be supplemented. More than anything not to leave the traditional way of teaching but to complement it a lot with the technology. And critical thinking for me is very fundamental because that helps the guy to see in a different way what he is developing.
	P8: yes, for me it would be in a balanced way because there are... from my perspective there is a lot of content that we can use, but the child does not learn so much only by receiving information, but also in what is the area has to have that own experience.
	P9: That is, I use several computer applications that serve as a true tool. But if you do not know that you are teaching, the technology you have unfortunately does not work.
	P9: As I said before for me the best thing is to use technology, but that it is not the only means. Because there are people who learn in that way. But there are other people who learn in different ways.
	P10: What do you do if there is no internet? You also have to know that you can live without it, but you have to know what you are going to do in case it does not work. Not just depend on it. Is it necessary at present? I say yes, but you also have to know what to do in case it's not available.
	P10: It would be interesting, I do not tell you that for me it is personally a 50 and 50, it would be that it is 50% digitization, in 50 percent still maintain what is the previous true.
	P10: So, I tell you, I think that for certain things use the digital part and for certain things use everything that is, a book, that I know, do different things with your hands, that it is not always something digital, but that you can create.

Figure 20. Perceptions of the use of Tech in the Classroom. High-SES analysis